UNIVERSITY OF ICELAND
SCHOOL OF ENGINEERING AND NATURAL SCIENCES
FACULTY OF INDUSTRIAL ENGINEERING,
MECHANICAL ENGINEERING AND COMPUTER SCIENCE

RAISE Center of Excellence

EURO

WP2 AI- & HPC-Cross Methods at Exascale – Monthly Meeting

Prof. Dr. – Ing. Morris Riedel et al.
School of Engineering & Natural Sciences, University of Iceland

2021-06-29, RAISE WP2 Monthly Meeting June 2021, Online

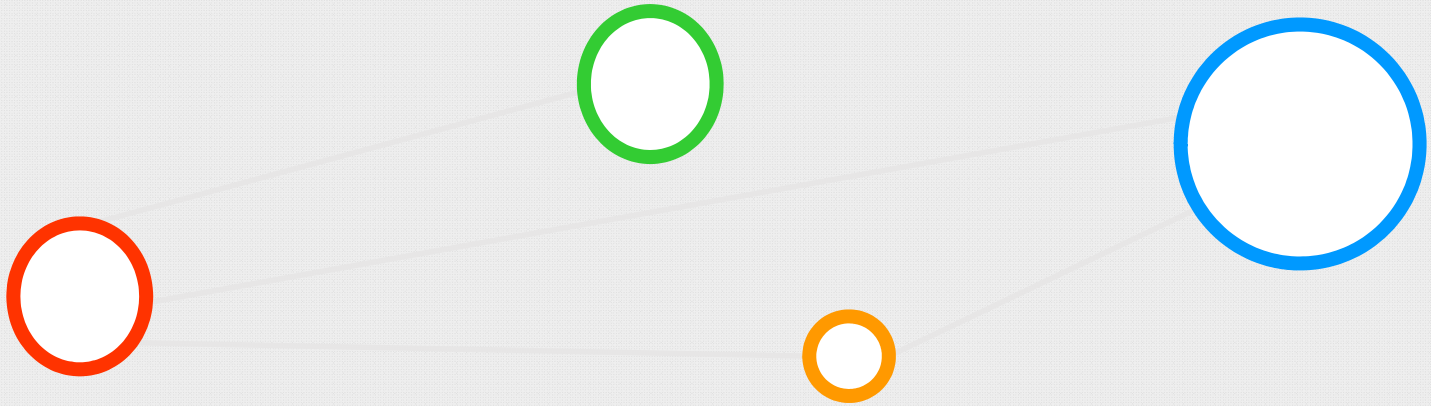
@ProfDrMorrisRiedel @Morris Riedel @MorrisRiedel @MorrisRiedel
https://www.youtube.com/channel/UCWC4VKHmL4NZgFfKoHtANKg morris@hi.is

WP2 June Meeting – Welcome & Agenda

RAISE Center of Excellence

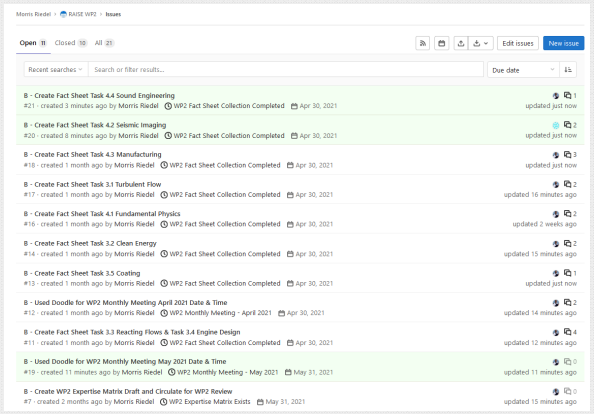
1. Approval of minutes from Monthly Meeting May 2021
   - (All), ~5 Min
2. Review WP2 Status on Interaction Rooms
   - (Morris Riedel, Matthias Book, Helmut Neukirchen), ~15 Min
3. Status Deliverable D2.6 "Support Report"
   - (Eray Inanc & Marcel Aach), ~5 Min
4. Upcoming Milestone AI/HPC Methods (M7)
   - (Morris Riedel & Andreas Lintermann), ~5 Min
5. Status RAISE Data Project
   - (Andreas Lintermann), ~10 Min
6. Compelling Scoreboard Review & Next Steps
   - (All), ~10 Min
7. Summer Vacation Plans & Next Monthly Meeting July & AOB
   - Doodle & Discussions, ~5 Min

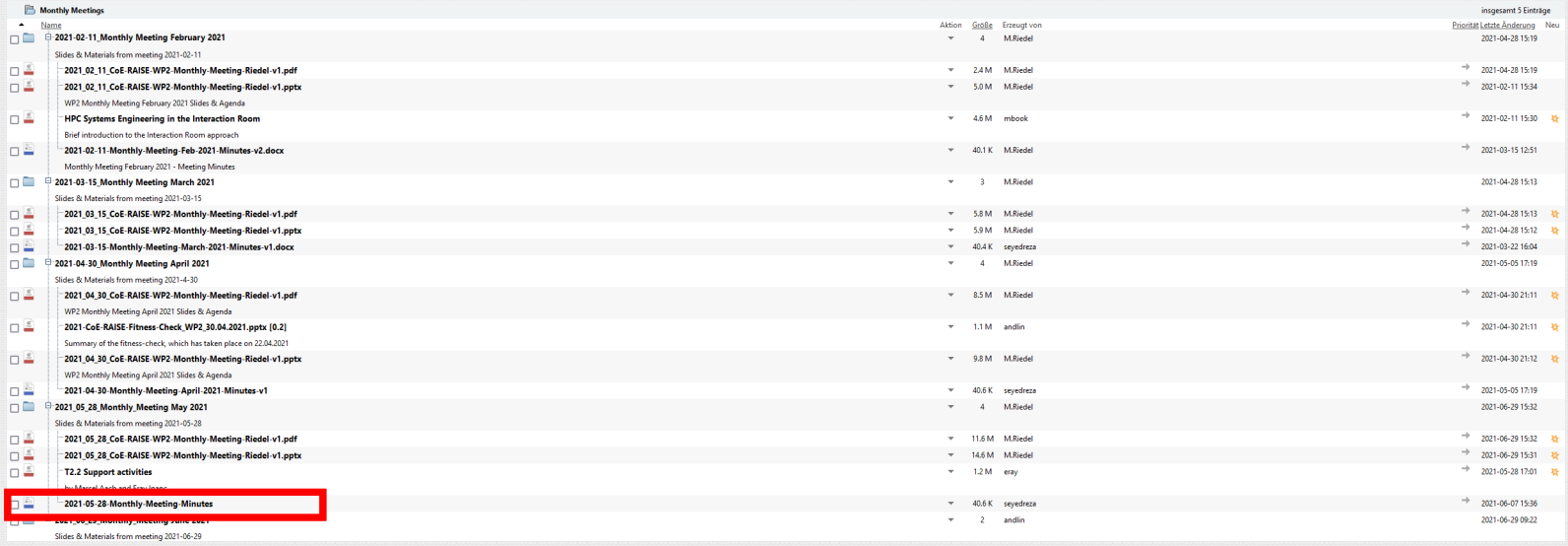
Agenda Item (1) – Minutes Approval – Meeting May 2021



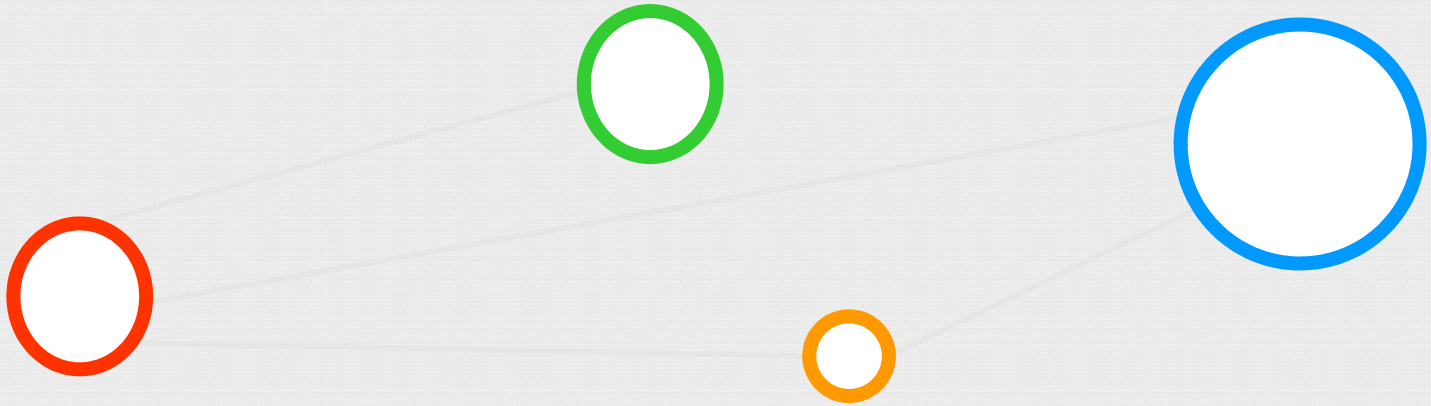
Minutes Approval – Monthly Meeting May 2021

1. Minutes available in BSCW
   - https://bscw.zam.kfa-juelich.de/bscw/bscw.cgi/d3380922/2021-03-15-Monthly-Meeting-March-2021-Minutes-v1.docx
   - TBD(all): Any objections or additions/changes?
   - Added Data project to the agenda today





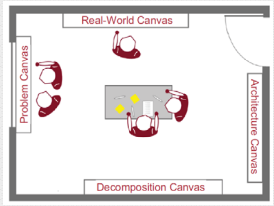
Agenda Item (2) – Review WP2 Status on Interaction Rooms

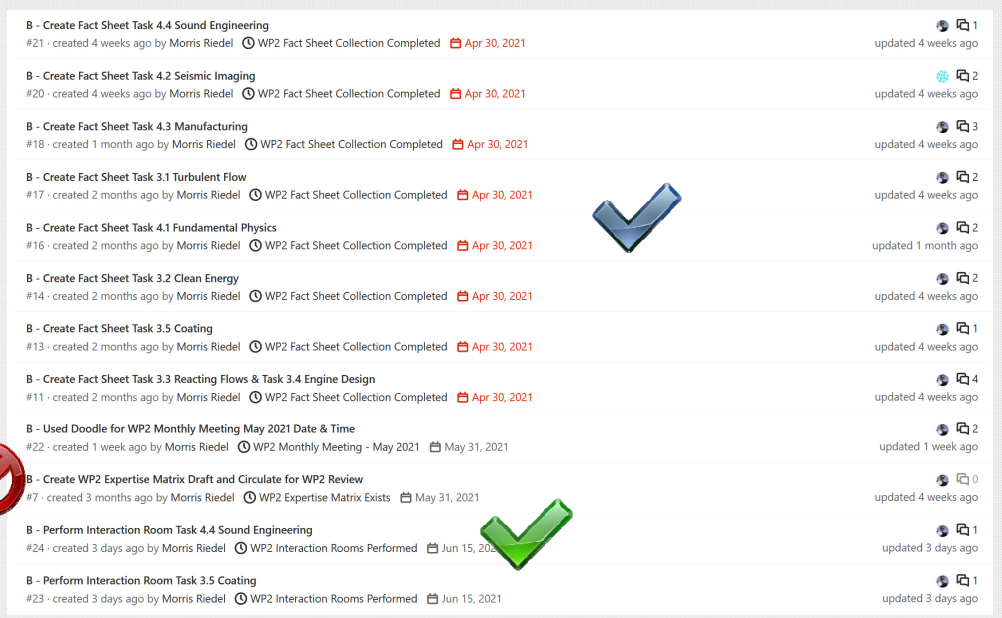


WP2 Updates – Action Items Tracker

- Follow-Through
  - Fact Sheet Actions done → Closing
  - Meeting with each use case teams done
  - Fact Sheet Draft existing for use cases
  - Refinement via Interaction Rooms started

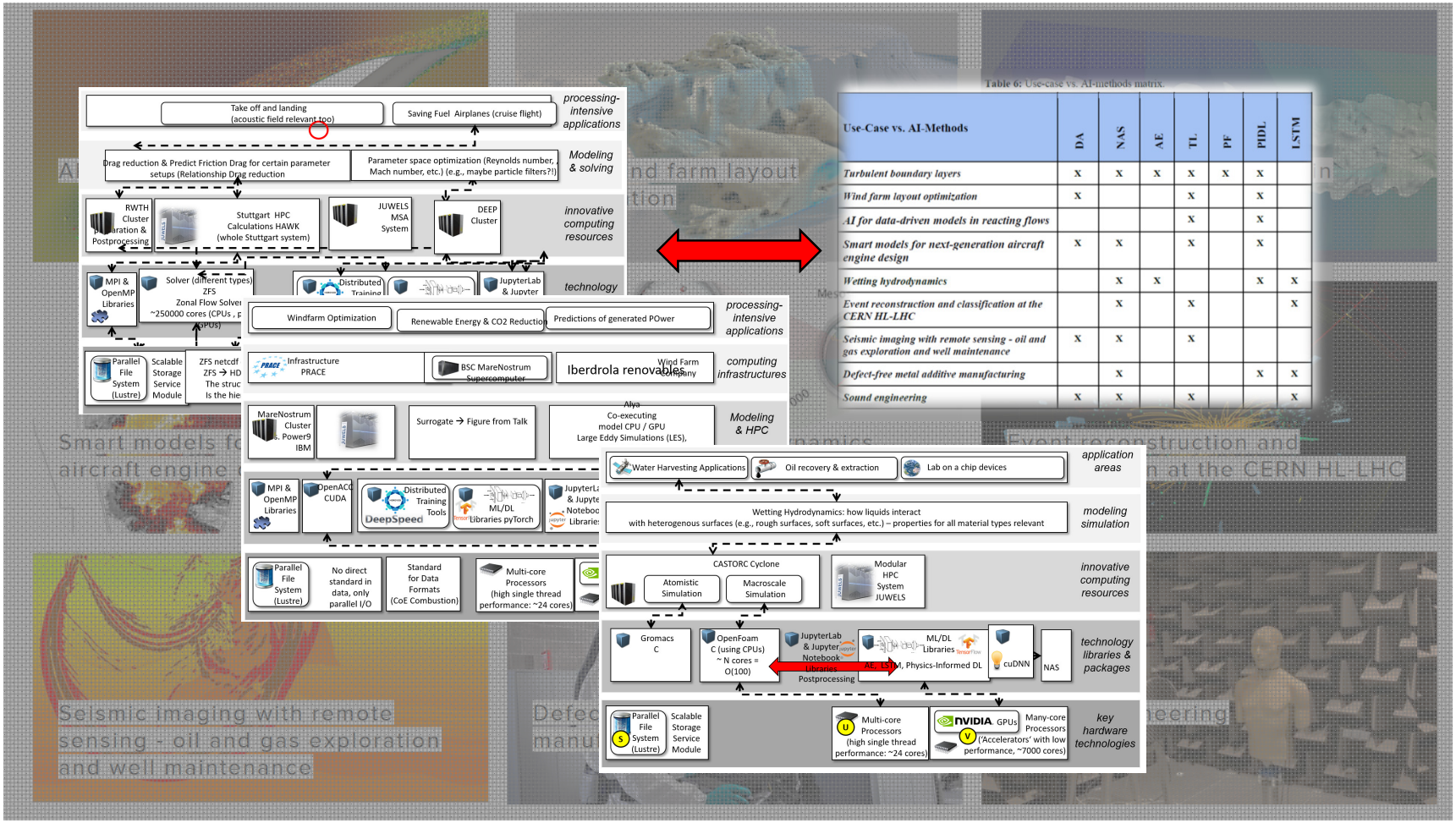
input to Interaction Room process





- https://gitlab.version.fz-juelich.de/riedel1/raise-wp2/-/issues

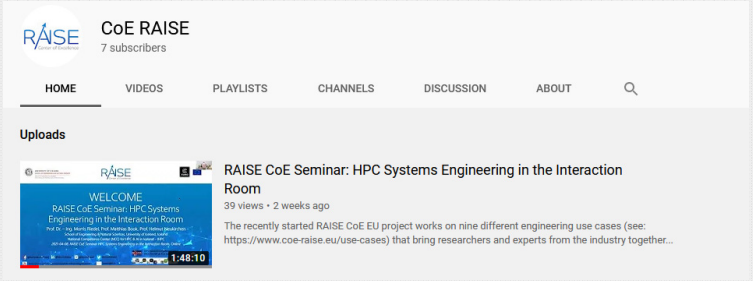
WP2 Updates – Action Item Fact Sheets (all use cases done)



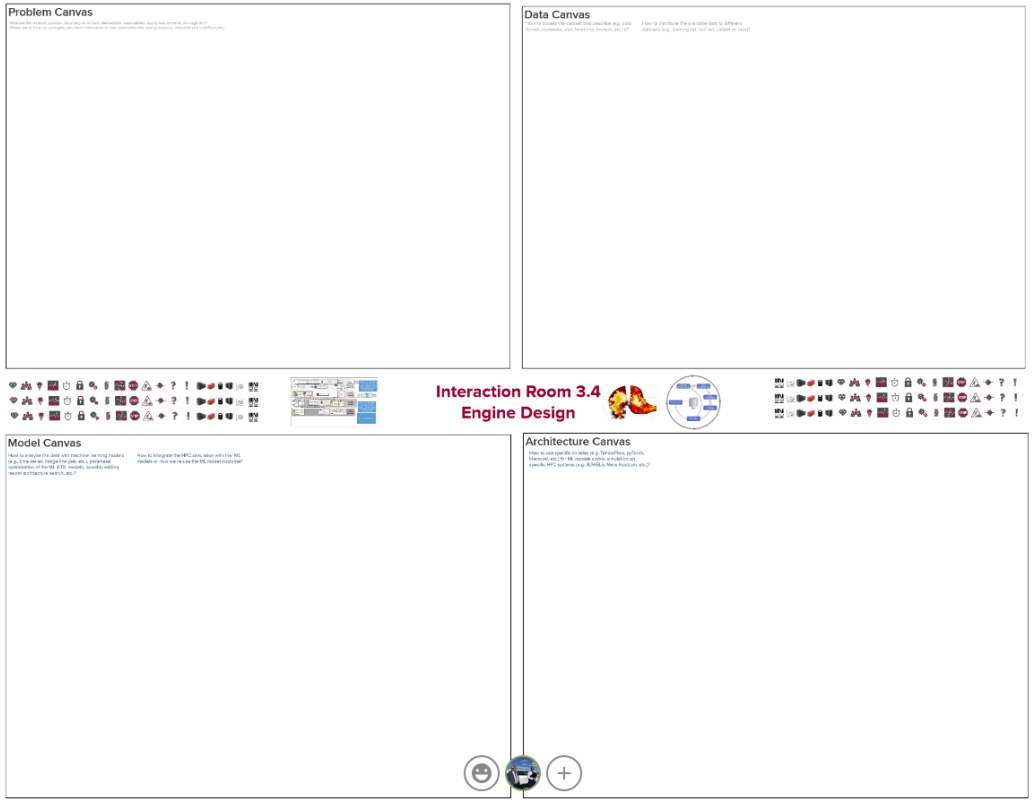
WORK IN PROGRESS

WP2 Seminar April – Interaction Room Performed on 8th April

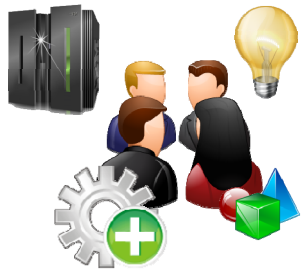
- Discuss shortly Feedback
  - Open to all communities (beyond RAISE)
  - Registration (input from WP6): enables user statistics & avoid trouble
- Material available on BSCW & RAISE@YouTube
  - https://bscw.zam.kfa-juelich.de/bscw/bscw.cgi/3396104
  - @WP2 team: Subscribe to YouTube channel RAISE: https://www.youtube.com/channel/UCAdIZ-v6cWwGdapwYxdN7dg



Interaction Rooms via MURAL Boards



- WP2
  - **Actions & Scoreboard**
    - Follow-through & Compelling Scoreboard
  - **Fact Sheets**
    - Fact Sheets & Materials
  - **Interaction Rooms**
    - **IR Mural Links**
  - **Library**



IR Mural Links

IR3.1 Turbulent Flow: https://app.mural.co/t/matthiasbook8855/m/matthiasbook8855/1621377866397/8613c384d54f66fb5e78599ff307a4ce8a9090c0?sender=u15e3008bb41d6628a5bb5701

IR3.2 Clean Energy: https://app.mural.co/t/matthiasbook8855/m/matthiasbook8855/1621377887905/cb44cca3eedd3bb9964fbfa36af16b1bfcce085f?sender=u15e3008bb41d6628a5bb5701

IR3.3 Reactive Flows: https://app.mural.co/t/matthiasbook8855/m/matthiasbook8855/1621377959022/0c363886f24833ecb19b025d87324b57fd50e2db?sender=u15e3008bb41d6628a5bb5701

IR3.4 Engine Design: https://app.mural.co/t/matthiasbook8855/m/matthiasbook8855/1621377976343/8d7aba6be09af3b2ffd305d2f709c53661ac889d?sender=u15e3008bb41d6628a5bb5701

IR3.5 Coating: https://app.mural.co/t/matthiasbook8855/m/matthiasbook8855/1621377991014/7a5d7e1eaf230178342d1e1d4a84d656d9055d52?sender=u15e3008bb41d6628a5bb5701

IR4.1 Fundamental Physics: https://app.mural.co/t/matthiasbook8855/m/matthiasbook8855/1621378007555/6f0d5285fcaec5eafa515bd6676c84d8b4879d39?sender=u15e3008bb41d6628a5bb5701

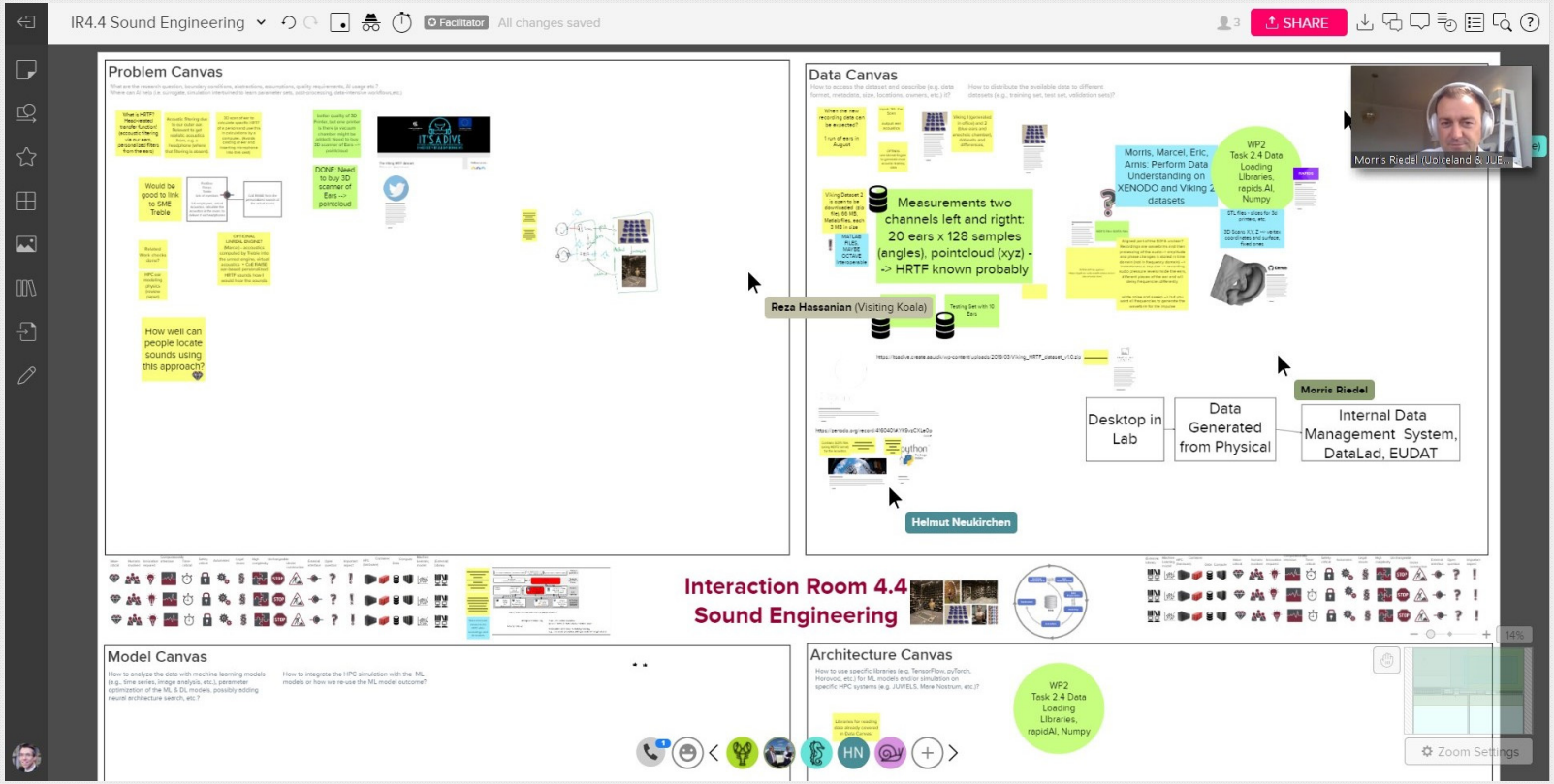
IR4.2 Seismic Imaging: https://app.mural.co/t/matthiasbook8855/m/matthiasbook8855/1621378023838/a0b9503abb837ae3e28af4bb8d9adbec33874998?sender=u15e3008bb41d6628a5bb5701

IR4.3 Manufacturing: https://app.mural.co/t/matthiasbook8855/m/matthiasbook8855/1621378038069/93df6fa7a41093f4eaae7be9d72979dc2ba42b9d?sender=u15e3008bb41d6628a5bb5701

IR4.4 Sound Engineering: https://app.mural.co/t/matthiasbook8855/m/matthiasbook8855/1621378050431/b5fa12219002404059f90a4bbb0101fa379a8503?sender=u15e3008bb41d6628a5bb5701

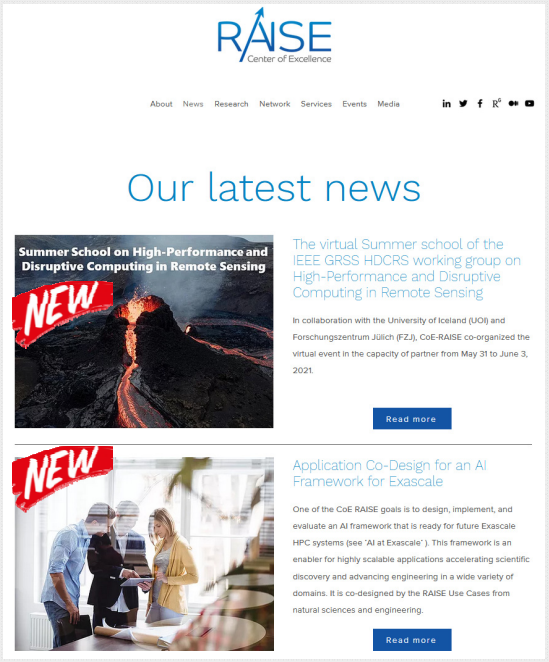
- https://bscw.zam.kfa-juelich.de/bscw/bscw.cgi/3591551

Interaction Rooms via MURAL Boards – Example (T4.4)



→ WP6 Input: News Item about Fact Sheet & Interaction Room Process Done (Morris, Helmut, Matthas)

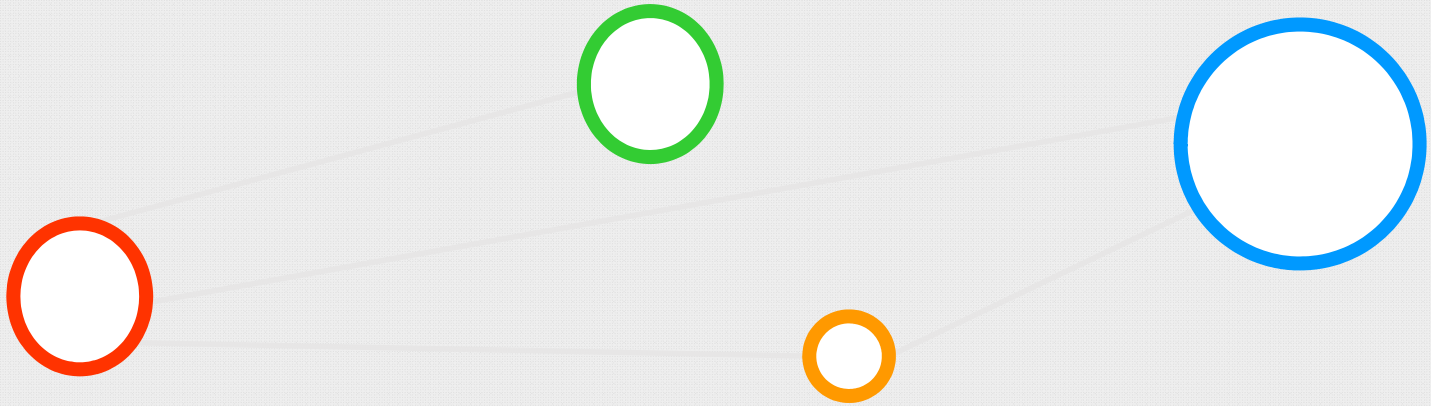
FactSheet & Interaction Room Webpage & WP2 News Items



→ WP6 Input: News Item about Fact Sheet & Interaction Room Process Done (Morris, Helmut, Matthas)

https://www.coe-raise.eu/news-2021-05

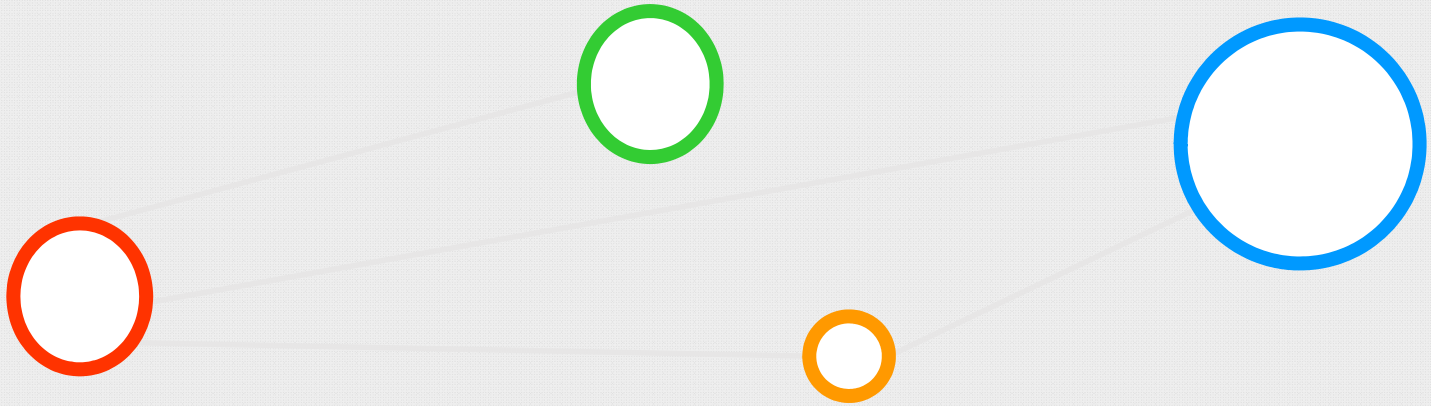
Agenda Item (3) – Status D2.6 "Support Report (M6)"



Agenda Item (3) – Status D2.6 "Support Report (M6)"

- Eray Inanc / Marcel Aach

Agenda Item (4) – Upcoming Milestone AI/HPC Methods (M7)



Upcoming Milestone AI/HPC Methods (M7)

- Discussions with PMO
  - Should be a formal report (not too long, not too short)
  - Links to MURAL Boards included
  - Summarizes findings of MURAL Board discussions (w.r.t. Model/Data/Architecture Canvas)
  - Refining our initial Matrix of Methods
  - Start writing from next week (TBD: Andreas Template? Morris first draft with others)

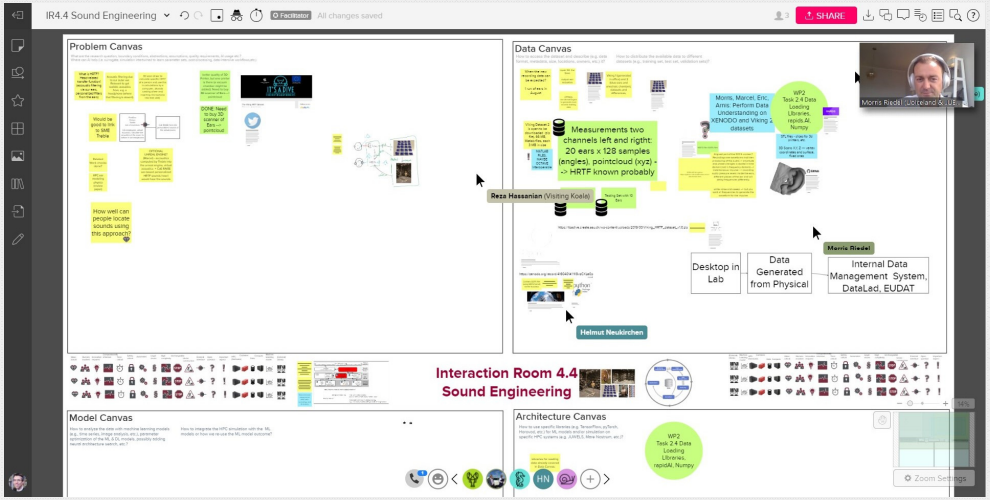
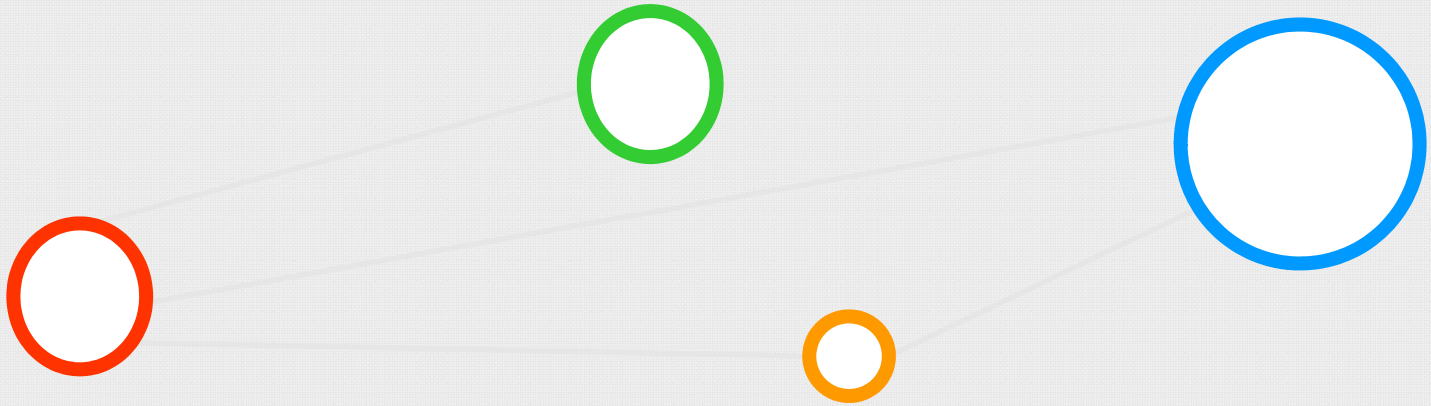


Table 6: Use-case vs. AI-methods matrix.

Use-Case vs. AI-Methods	DA	NAS	AE	TL	PF	PIDL	LSTM
Turbulent boundary layers	X	X	X	X	X	X	
Wind farm layout optimization	X			X		X	
AI for data-driven models in reacting flows				X		X	
Smart models for next-generation aircraft engine design	X	X		X		X	
Wetting hydrodynamics		X	X			X	X
Event reconstruction and classification at the CERN HL-LHC		X		X			X
Seismic imaging with remote sensing - oil and gas exploration and well maintenance	X	X		X			
Defect-free metal additive manufacturing		X				X	X
Sound engineering	X	X		X			X

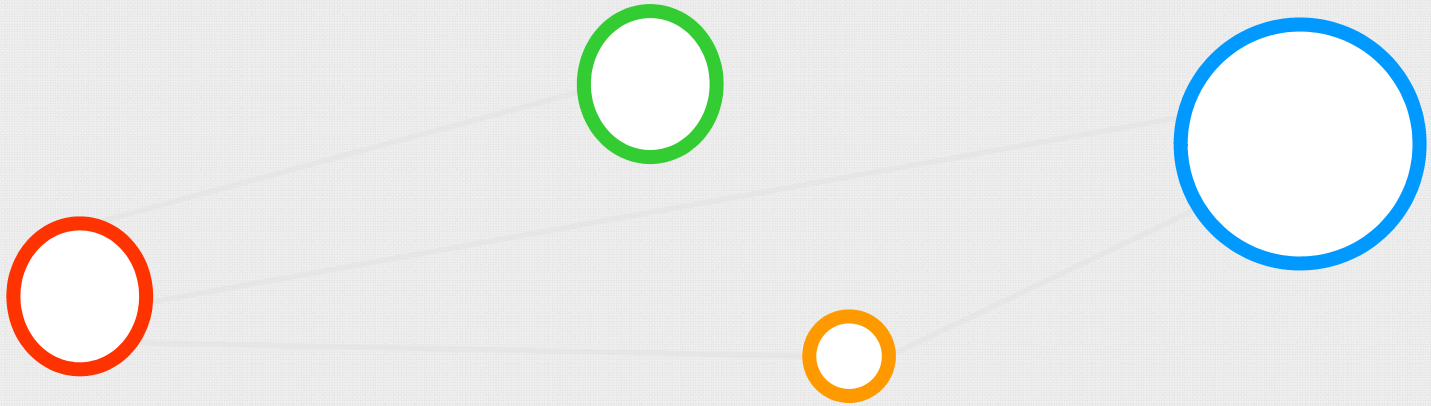
Agenda Item (5) – Status RAISE Data Project



Agenda Item (5) – Status RAISE Data Project

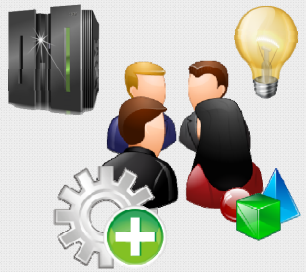
- Andreas Lintermann

Agenda Item (6) – Compelling Scoreboard Review & Next Steps



Interaction Room Status & Discussions – WP3/WP4 Overview

- WP3
  - T3.1: Turbulent Flow (started)
  - T3.2: Clean Energy (started)
  - T3.3: Reactive Flows (started)
  - T3.4: Engine design (partly covered by T3.4)
  - T3.5: Coating (started)
- WP4
  - T4.1: Fundamental physics (pending)
  - T4.2: Seismic imaging (pending)
  - T4.3: Manufacturing (started)
  - T4.4: Sound engineering (started)



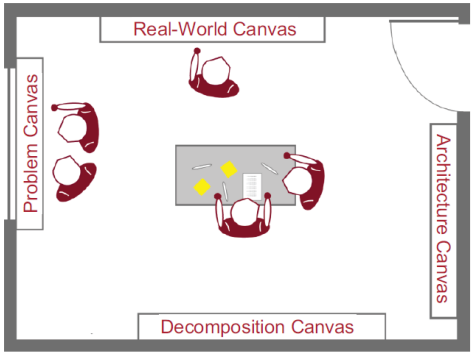


Table 6: Use-case vs. AI-methods matrix.

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Wind farm layout optimization	X			X		X	
AI for data-driven models in reacting flows				X		X	
Smart models for next-generation aircraft engine design	X	X		X		X	
Wetting hydrodynamics		X	X			X	X
Event reconstruction and classification at the CERN HL-LHC		X		X			X
Seismic imaging with remote sensing - oil and gas exploration and well maintenance	X	X		X			
Defect-free metal additive manufacturing		X				X	X
Sound engineering	X	X		X			X

- Next Steps
  - Interaction Room scheduled with all teams
  - Carve out more details on AI/HPC methods
  - Identify concrete detailed algorithms

Compelling Scoreboard Review – Use Case Progress

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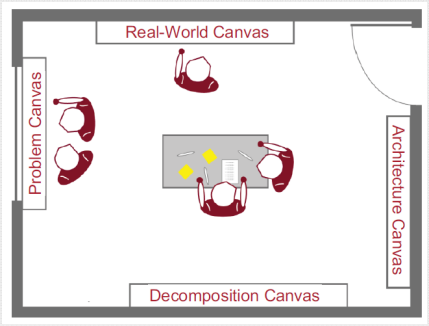
❖ **Fact Sheet Process & Interaction Room (started): revision & refinement process more dense (initial round)**



Next Steps:

- Interaction Rooms for AI Methods & Fact Sheet Refinements
- TBD(Morris, Helmut, Matthias): invite to doodle polls for finding meeting spots over the next weeks
- Pace: ~2-3 Interaction Rooms per week
- Continuing until ~mid July
- Input to Milestone

Compelling Scoreboard Review & Next Steps

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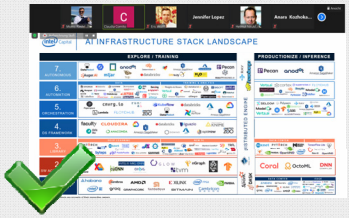
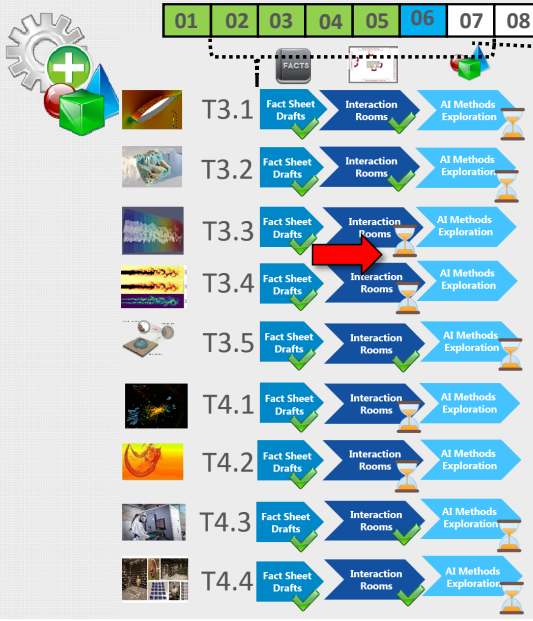
- ✓ Call for Monthly Meeting February & check missing people in WP2 (Kick-off)
- ✓ Monthly Meeting February
- ✓ Final D1.5 (M2) & D1.2 (M2)
- ✓ Monthly Meeting March
- ✓ IR Seminar 2021-04-08
- ✓ Monthly Meeting April
- ✓ Monthly Meeting May
- ✓ DataLad Seminar 2021-05-28
- ✓ HeAT Seminar 2021-06-28
- ✓ Report on support activities (M6)
- ▪ Quaterly Report 2 (M6)
- ❖ AI/HPC Methods (M7)
- ▪ D2.12 Software layout plan for a unique AI framework (M9)
- ❖ Horovod Seminar ~end July

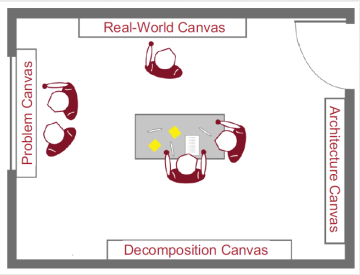
HEAT Helmholtz Analytics Toolkit

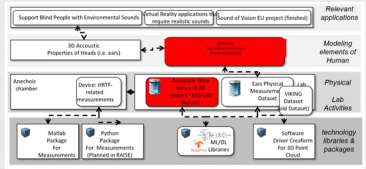


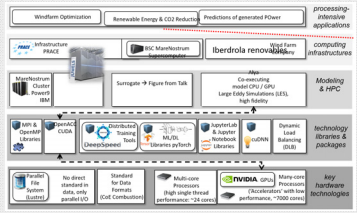
01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36



❖ Fact Sheet Process & Interaction Room (started): revision & refinement process ongoing



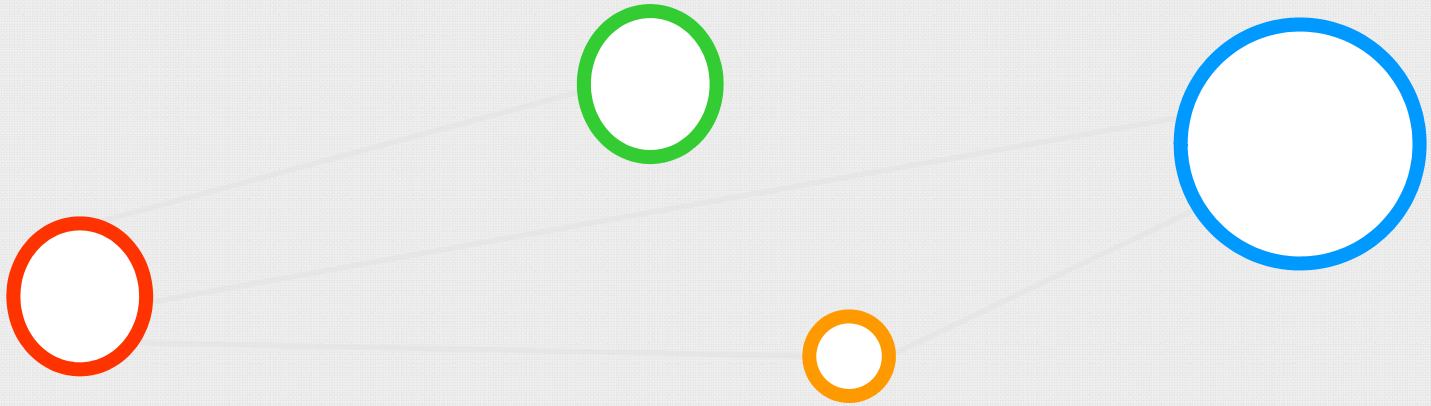




Next Steps:

- Milestone M7 and QR2!
- Continue Interaction Rooms & Update our Fact Sheets over time

Agenda Item (7) – Vacation WP2 Meeting July & AOB



Agenda Item (7) – Vacation WP2 Meeting July & AOB

1. Vacation Periodin July?
    1. July meeting feasible (Milestone, deliverable upcoming, etc.)
    2. Doodle poll to find out, maybe before mid july 12-16 July
    3. Seminar in July ok because recorded, but speakers also from us (e.g., Eric, Atos team, etc.)
2. AOB
    1. New slide templates from PMO?
    2. Galaxy to share data?
    3. Schedule in Outlook for Friday Interaction Room! 9:00 GMT / 11:00 CEST

drive. enable. innovate.

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The CoE RAISE project have received funding from
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Research and Innovation Framework Programme
H2020-INFRAEDI-2019-1 under grant agreement no. 951733