

Interactive Session – Introduction

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Monday 13/11/2023

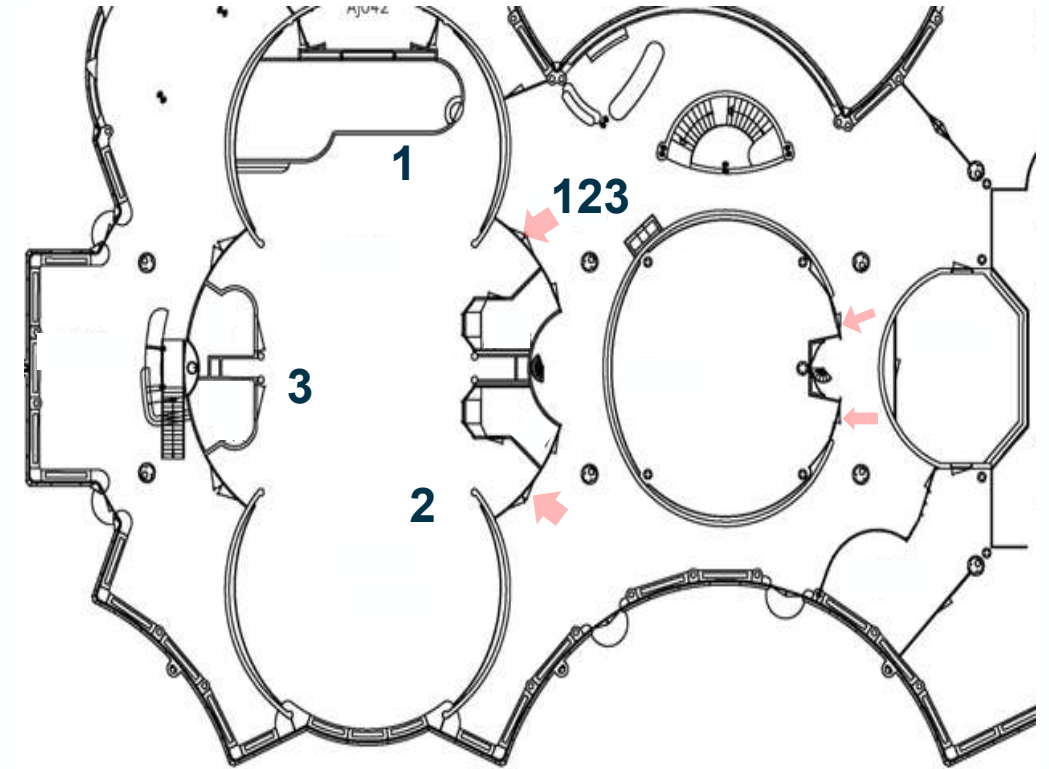
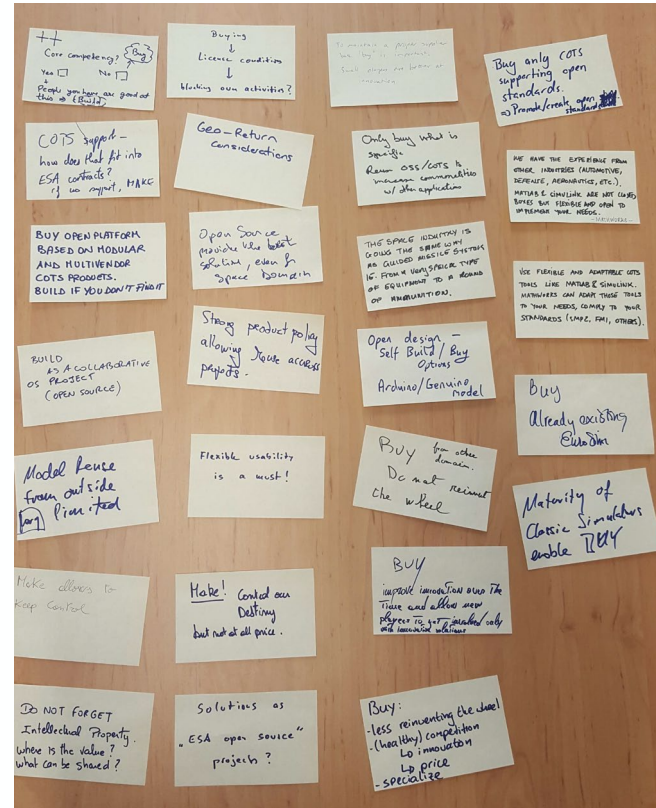
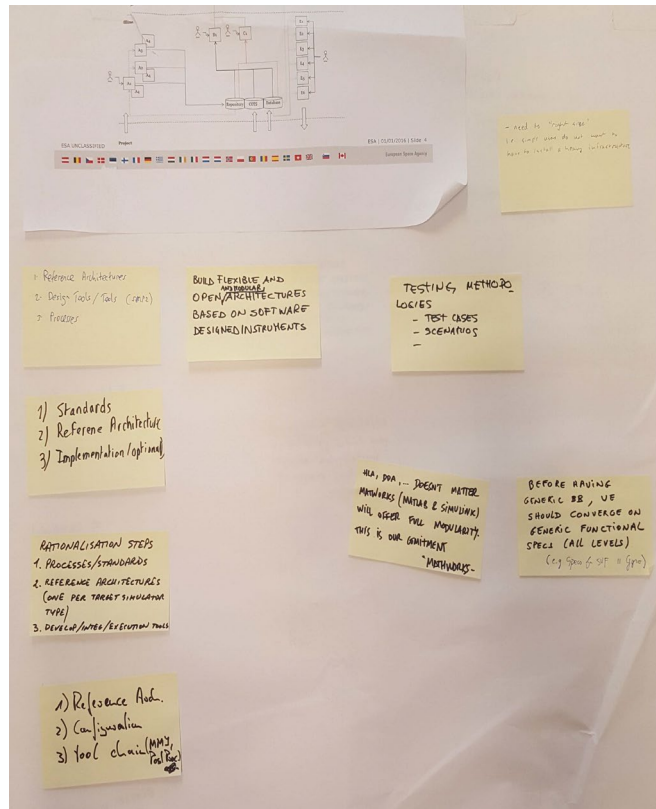
Interactive session on

“Making AR/VR a Reality in Space Mission”

- An interactive discussion around 3 selected topics
- Tuesday 12 December 16:00 – 17:00 in Newton
 - Part 1: Moderated discussion per topic (30 minutes)
 - Part 2: Moderators provide a synthesis (30 minutes)
- The results will be published on the workshop website

You can provide your input any time in advance of the session!

- The discussions will be centred around 3 flipcharts
- You may add your ideas and suggestions on sticky notes on the flipcharts
- The flipcharts will be outside of Newton before the session



Topic 1

Embracing AR/VR technology in organisations

“We need a new generation of engineers raised with XR gaming technology to lead the older generations to the uptake of it.”

“Large tech companies focusing too much on social immersive interaction are blocking the uptake of XR in business operations.”

the uptake of it."

"Large tech companies focusing too much on social immersive interaction are blocking the uptake of XR in business operations."

More knowledge transfer from game development world
"serious games"
UI/UX design

Social immersive interaction is an enabler for business ops

ON THE OTHER HAND, WE NEED RESPONSIBLE TECHNOLOGY
(KIDS NEED LESS, NOT MORE TECH)

Link the right people
XR experts and end-users
↓
telling how to make process more efficient w/ fresh ideas

It is a matter of mindset not age

Underline vision
for all:
AR/VR is easier to embrace when companies & agency pinpoint goals on short and longer run

Troubleshoot the best means to teach across generations: How to transfer new knowledge?
Youtube videos, workshops, mentor across generation at work

Gather use cases
create common ground
↓
develop standards for XR
ESA should lead this

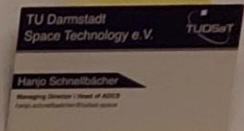
Better PR & Outreach from XR developers to show potential to funding entities

Take more risk - get funding (European problem)

Software development is often relying on internal funding

All dev is good dev in this point: it cannot hinder uptake of business ops when training for XR use is done well. → multi-disciplinary communication

The new generation
↓



create common ground
↓
develop standards for XR
ESA should lead this

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from XR developers
to show potential
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communication

Managers do not
understand how
much time it
takes to develop
XR apps → expectations
are off

Solution:
pilot projects

Create awareness on
changing technology
→ create overview
of which devices
are used, to have
the apps support

Topic 2

Maturity of AR/VR hardware devices

“Currently available XR hardware devices are a limiting factor.”

“The lack of visibility and reliability of future company roadmaps is hampering the adoption of new XR hardware devices.”

"The lack of visibility and reliability of future company roadmaps is hampering the adoption of new XR hardware devices."

PR, Design, Inspection

Ergonomics of different user environments can be limiting →
Understanding ergonomic needs (work, rest, etc.) remains a limitation

mainline
No clear path for each
Smartphone &
AR Apps
Comma-TB

AR

VR

Advanced AR devices are
too far for prototyping &
development.

AR

We have now one fully
functional VR headset
in order ... How to
tackle the environment or
additional headsets??

MR not good enough to
replace AR, because of:
- delay
- depth perception
- safety & robustness

Future of AR

Market?
improvements needed:
- accurate depth perception
- model for current AR
- Battery life
- Ergonomics & comfort
- Resolution

Projector tech
may be an alternative,
but needs to mature

Bio-monitoring to
improve ergonomics

AR entering a too inaccurate
to use for simulation
- better alternatives
- image
- mini video's
Comma-TB

Use-work safety
research needed

System fragmentation
of tracking solutions

Topic 3

Justifying the benefits of using AR/VR technology

“The benefits do not outweigh the efforts required to develop and configure XR applications.”

“The focus is currently too much on technology push rather than on addressing the user needs.”

Technology Path & Objectives
 - we need to
 - can be mapped
 - via design tools
 - including multi-disciplinary
 - analysis, training in technology
 - projects
 - some more to do

VR/AR Training Case
 - going to the moon and beyond
 - require the astronaut to
 - be capable of getting out
 - of the claustrophobic environment
 - of the space laboratory
 - and transportation vehicles and
 - into the hostile environment of space
 - in preparation for a mission
 - to Mars

Risk for AR/VR adoption
 in relevant space missions
 with ESA industry to
 facilitate co-engineering,
 efficiency and reliability, as in
 demonstration, training...

Hauke Ernst, Airbus
 Support the alignment of related
 ESA activities, industrial capabilities
 and SME products towards a
 modular, interoperable framework
 of standards and interfaces for
 AR/VR / Digital Twins, in order to
 achieve interoperability, e.g. from
 S4A-X marketplace for building

A COMMON ONTOLOGY
 WOULD ALLOW A
 MORE CONSOLIDATED
 START POINT

EMILIO CAJALINI, PRIMI
 CHECK WITH CURRENT
 USE OF VR & IMMERSIVE
 HEALTH CARE SCENARIOS:
 - PAIN MANAGEMENT (IN CASE
 OF WOUNDS IN SPACE)
 - MEDICAL TRAINING OPS

Hauke Ernst, Airbus
 Support TRC raising ~~some~~
 together with industry,
 demonstrating customer pull
 - joined R&D
 - requirements/incentives in space
 missions

NEED TO INVEST
 MORE ON LOOKING
 FOR REAL USE CASES
 (BENEFITS OUTWEIGHING EFFORTS)

IS AR/VR the best training
 Solution?
 -> learner needs analysis
 -> Are the learning objective
 actually met?
 Dominique TFS

- INCLUDE USERS FROM STEP 1 OF THE
 DESIGN PROCESS
 - ASSESS THE SYSTEM IMPACT ON
 END USERS
 - STANDARDIZE DESIGN AND ASSESSMENT
 METHODS

Creating standards for UI/UX
 design
 Users can create their interface
 without development.

AR for ~~mission~~
 AIT/VR
 mission
 We need to make
 authoring easier and
 more standardized
 if we want ~~to see this~~
 this to be generally adopted

with an
associated cost-
effectiveness and ability, eg.
training, maintenance...

- saved R&D
- requirements/incentives in spec missions

We need to make
authoring easier and
more standardized
if we want ~~to make~~
this to be generally adopted

INVEST ON STANDARDS
AND INTERFACES
TO REDUCE EFFORT/COST
(OSC? ISO?)

Creating and updating
scenarios must become easy to
do to not be blocking or too
difficult/expensive to implement

XR SHOULD NOT FOCUS
JUST IN THE "PHASE"
E.G. USING SAME DATA
DESIGN → TRAINING → WORK
(VR) (VR/MR) SUPPORT (AR)

Portability - helps
experience, etc. between
different projects not
sufficient.

Creating adequate
content is key

AR interfaces need
to be designed to be
intuitive → focus on UX/UI.

XR-SYSTEM SHOULD BE
IMPLEMENTED TO ACTUAL
PROCESS. OTHERWISE IT IS
DOUBLE WORK TO DO
CONTENT.

In general, users not
sufficiently well
connected in AR/VR
initiatives presented
why? lack of time?
lack of priority?

Usage of AR/VR
as a program
requirement (by ESA
NASA...)

Push for better
open source solutions
required (standards...)

If we take all ideas and
suggestions from engineers
and launch into account
this would result in
invaluable experience
keep good user design in
mind.