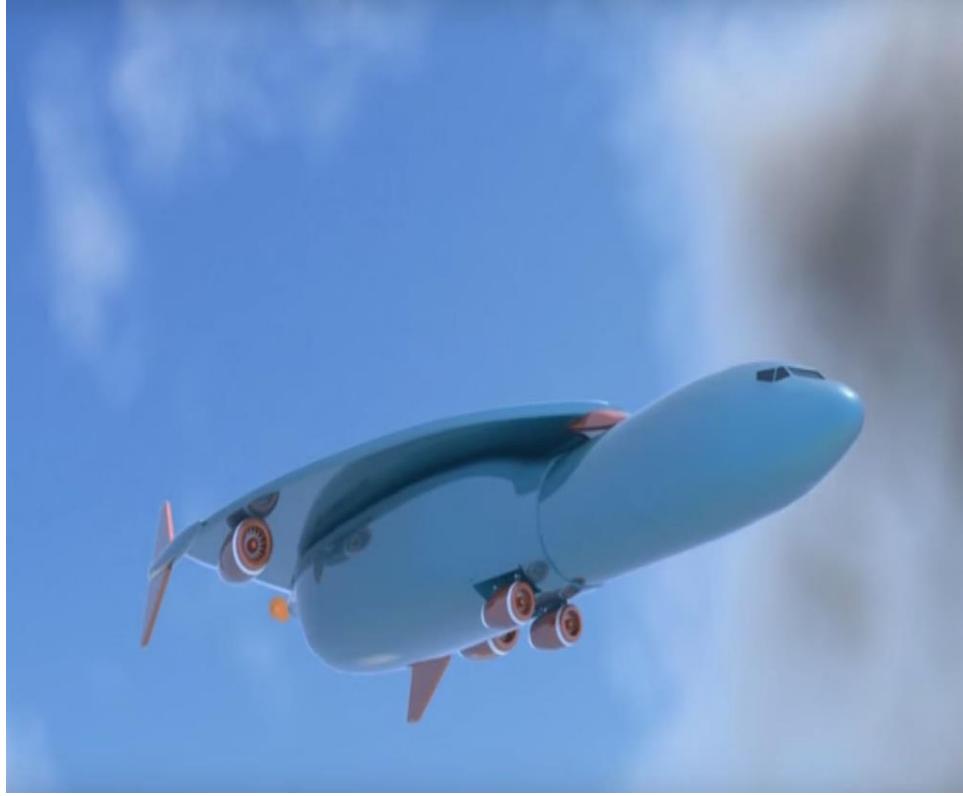
Background slides



CERN Ideas

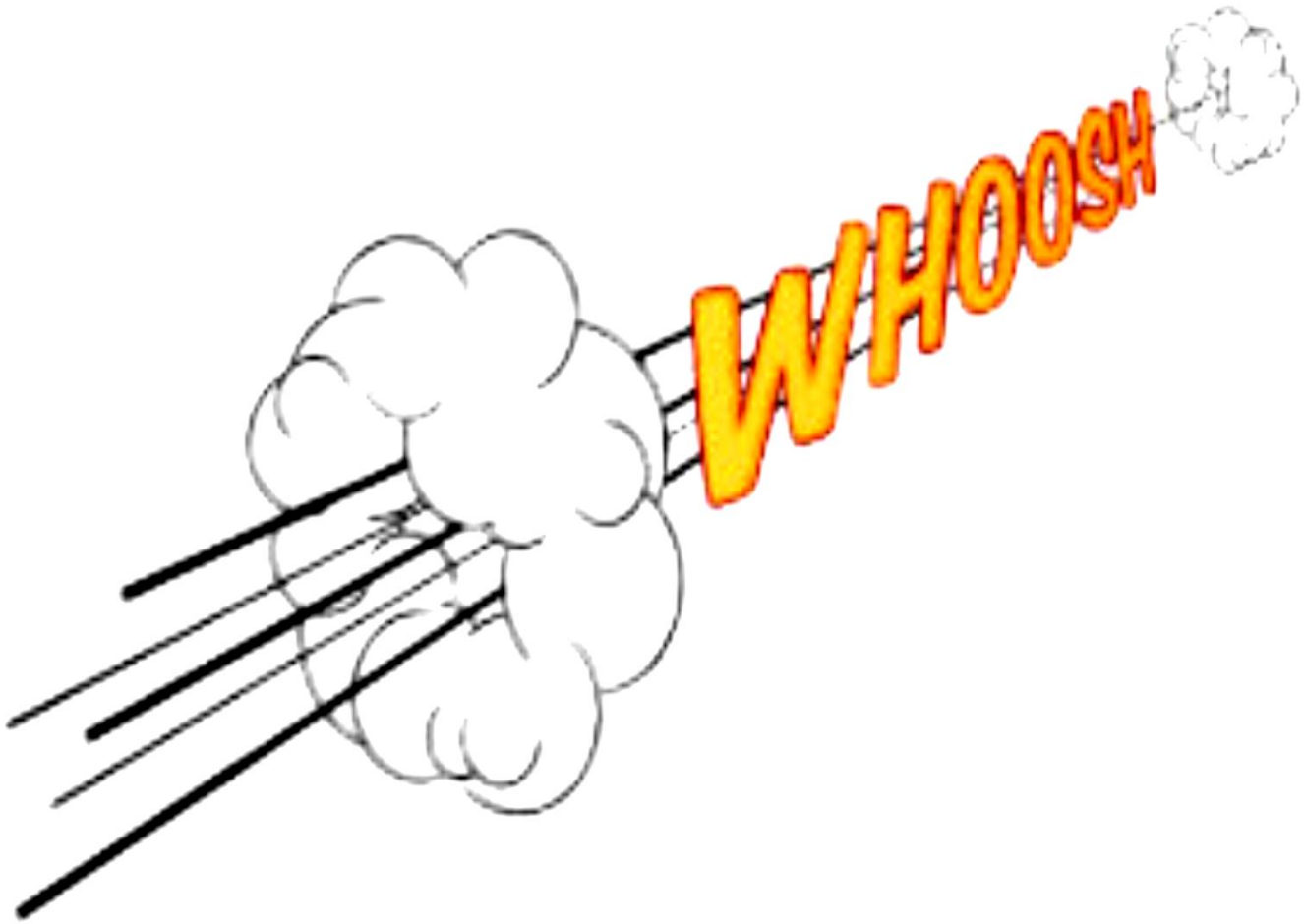
esa European Space Agency

easn

High Speed Initiative (Workshop Porto, October 21st, 2016)

Why this initiative?

- High-speed air transport remains a "big challenge" both as an engineering and a business case.
- It has the potential to transform our lives and economies.
- It is a complex challenge where many disciplines are interlinked (engineering, business, design, etc).
- Addressing this complexity requires a large collaborative effort engaging and educating different actors and institutions.



Why an educational approach (driven by engineering)?

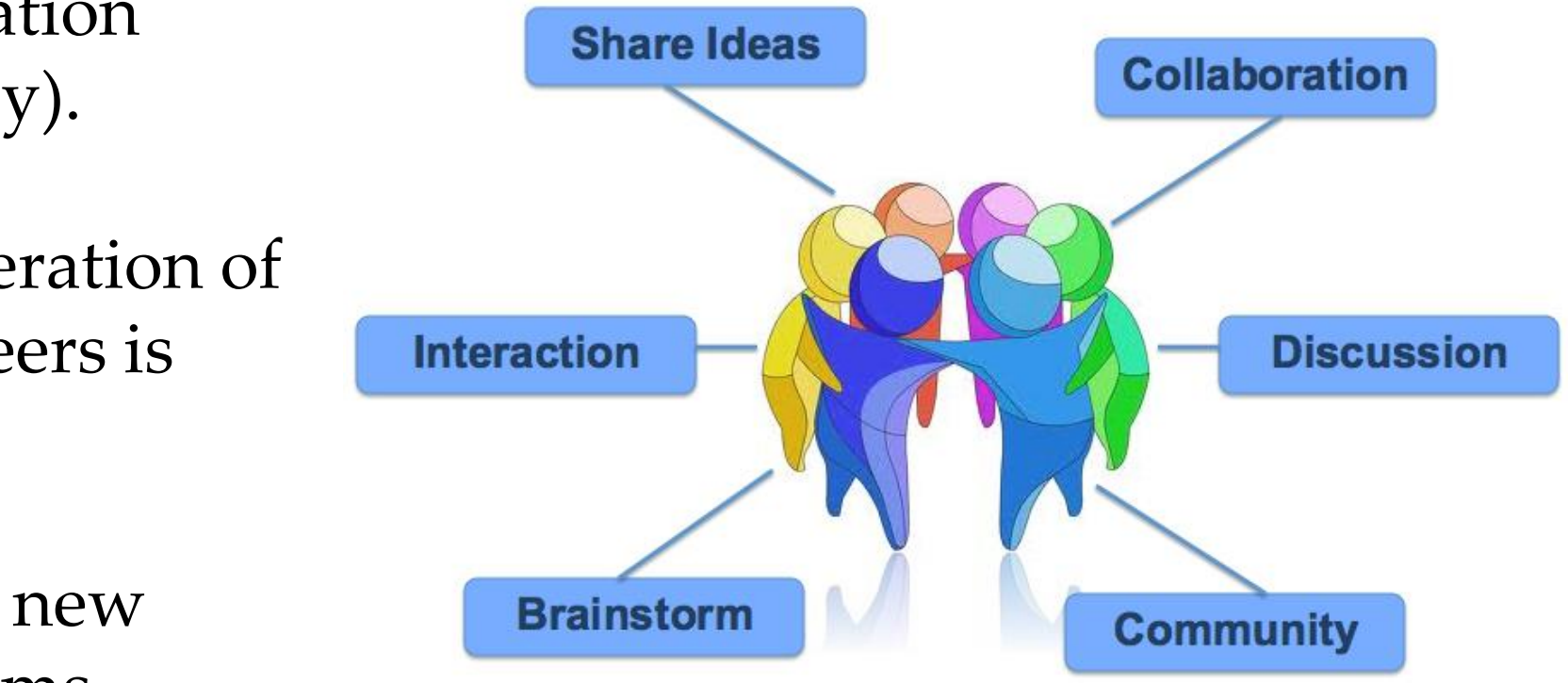
- A challenge of a 300 passenger high-speed airplane…we think is a highly motivational project for a wide range of students (…the "I contributed to it" philosophy).
- Students think without prejudices…they challenge all assumptions.
- Developing an open platform for such a collaborative effort acts as a pilot project for other engineering & societal student challenges

Are we ignoring past efforts or industry?

- Absolutely NOT (We are aware: Hikari, LAPCAT, etc).
- Industry advice and help is very welcome in sharing information. Our main driver is the educational component and openness.

Will CERN, EASN and ESA now build together a high-speed aircraft?

- Absolutely NOT (Our focus is HEP, Space and Aviation Research respectively).
- Educating next-generation of scientists and engineers is important to us.
- We are interested in new collaborative platforms.



General characteristics (1)

- Educational and collaborative initiative with a strong engineering component, as proposed by CERN-EASN-ESA.

- Long term (approx. 7 years).

- Holistic (i.e. not only the vehicle but also infrastructures, regulations, business models, user-experience, etc).

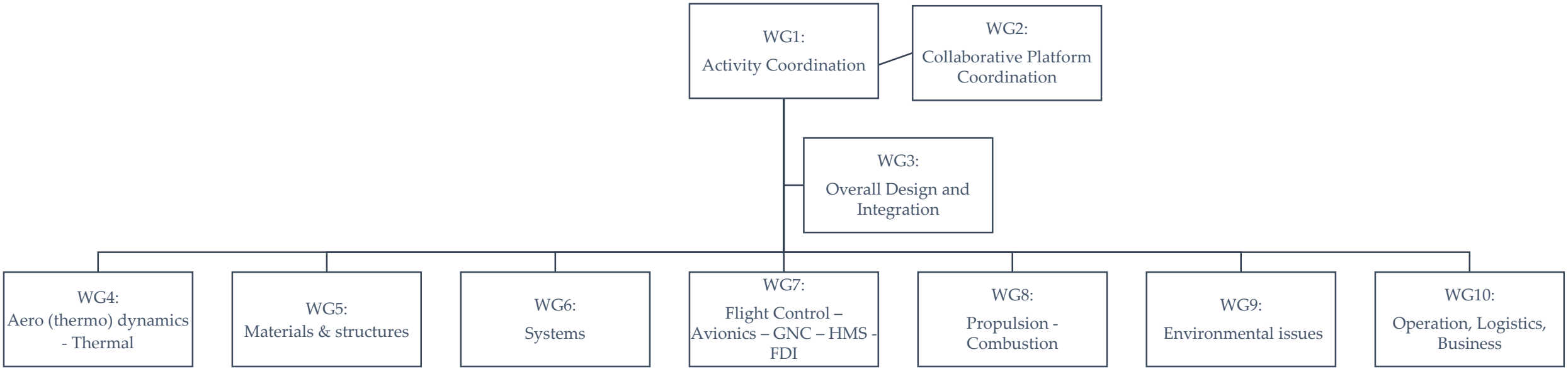
- "Out-of-the-box" thinking when possible (i.e. technology dictate the rules but technology can be challenged).

- Open to all institutions willing to participate as well as open to outside world (i.e. no NDAs, "no secrets").

General characteristics (2)

- Requires in-kind contributions.
- Public funding can help -- but it is not a must.
- Students are the main executors under expert supervision.
- Remote collaboration through tailored platform will be promoted.
- Final “Product Integration” done by the institutions (not left to students)

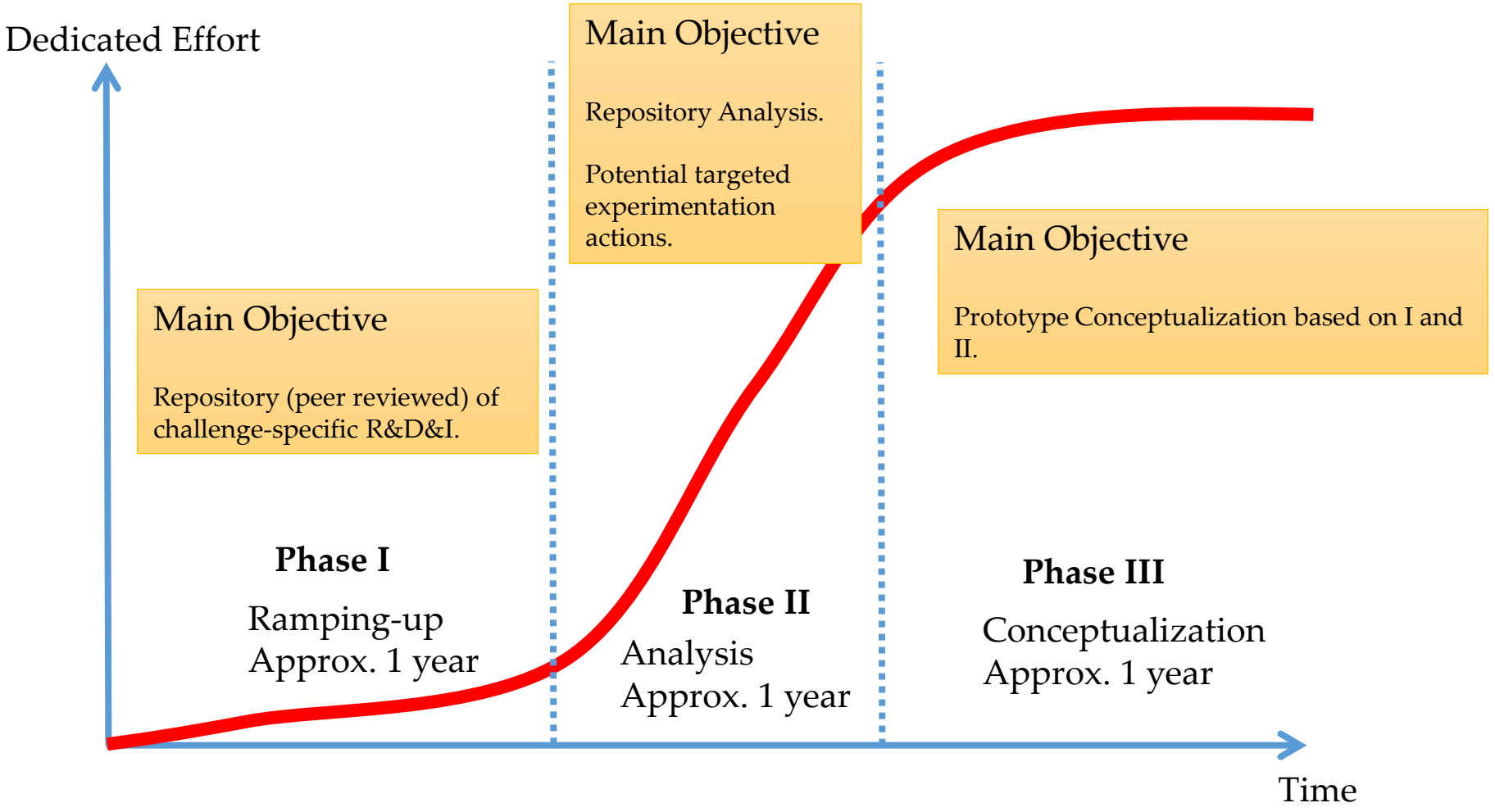
Suggested Working Groups



Initiative overview

Minimum effort is 3 years;

If EU funding available it could be extended.



Phase I: Ramping-up

Resources

- Existing curricular activities and resources in organizations.
- CERN first version of collaborative platform available (allows creating repository).

Effort

- Each organization requires limited effort.

Objectives

- After 1 year elaborate a peer reviewed database out of existing R&D&I activities specifically **challenge oriented.**
- R&D&I database (or repository) based mainly on students' projects (i.e. master thesis, PhDs, etc).

Modus Operandi

- Distribute participating organizations around the challenges (Work Groups).
- Each WG has an overall coordinator.
- Materials uploaded in repository should be peer reviewed by professors of each institution.

Phase I: Ramping-up

Must have

- In-kind contribution of participants.
- Basic collaborative platform.
- At least 2 meetings among WG Coordinators.

Nice to have

- Small EU funding (i.e. CSA type or COST) to cover “ramping-up efforts” (i.e. meetings, workshops, etc).
- General Workshop(s) for all participant organizations (i.e. to share and check challenges and repository).

Phase II: Repository Analysis

Resources

- **Within existing or beyond** curricular activities in organizations.
- Enhanced version of collaborative platform (CERN).

Effort

- Effort from each WG coordinator beyond "daily activities".

Objectives

- After 2 years elaborate a synthesis of the gathered **challenge oriented** R&D&I.
- Propose complementary and missing key experimentation/ simulation suitable to be realised by students.
- Integrate results in the synthesis.

Modus Operandi

- Each WG coordinator spends time elaborating synthesis of results of Phase I and indicates key missing experiments/ simulations.
- Each organization determines the feasibility to carry on key missing experimentation/ simulation
- Each WG coordinator elaborates a final report per challenge.

Phase II: Repository Analysis

Must have

- In-kind contribution of participants.
- Enhanced collaborative platform.
- Final synthesis report per challenge.
- At least 3 meetings among WG Coordinators.

Nice to have

- EU funding to cover efforts related to synthesis and potential experimentation as well as other activities (i.e. design of enhanced collaborative platform, meetings, workshops, etc).
- General Workshop(s) for all participant organizations (i.e. to share and check challenges vs. synthesis).
- Extra key experiments/simulations based on synthesis report.

Phase III: Conceptualization

Resources	Effort	Objectives	Modus Operandi
• **Existing and beyond** curricular activities in organizations. • Enhanced collaborative platform.	• Each organization requires effort beyond “daily activities”.	• After 3 years conceptualise a prototype of the future 300 passenger civil supersonic aircraft.	• Organise participating organizations around the challenges (Work Groups). • Each WG has an overall coordinator. • General student activity: conceptualize prototype with information of all WGs.

Phase III: Conceptualization

Must have

- In-kind contribution of participants.
- Enhanced collaborative platform allowing WG collaborative work (synergies).
- Final conceptualization report.
- At least 3 meetings among WG Coordinators.
- General Workshop(s) for all participant organizations (i.e. to share and check challenges).

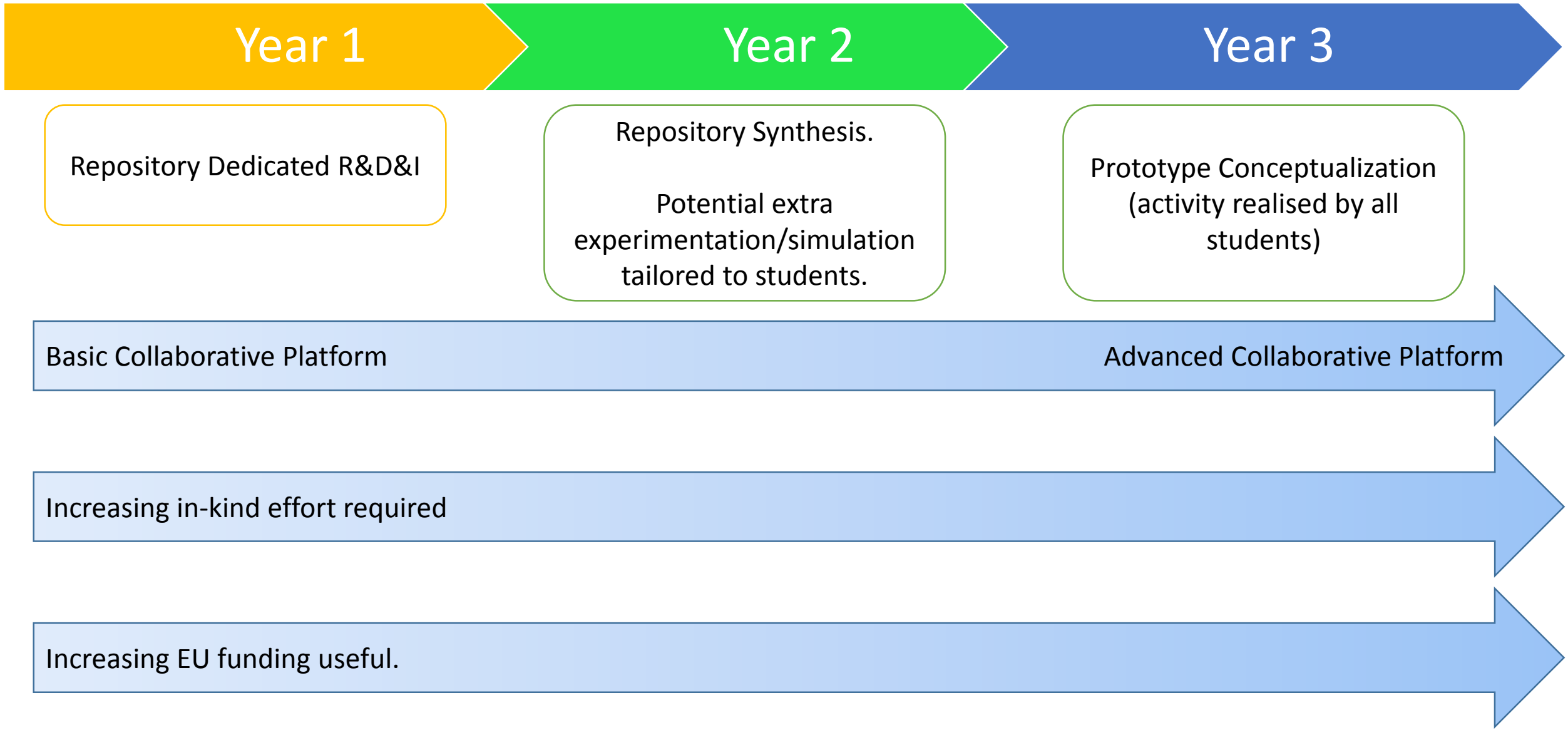
Nice to have

- EU funding to cover efforts related to conceptualization and potential experimentation as well as other activities (i.e. design of enhanced collaborative platform, meetings, workshops, etc).

High Level Gantt Chart

Minimum effort is 3 years;

If EU funding available it could be extended.



Next steps: organizing the ramping up

- ❑ Identify those of you willing to take part in this initiative.
- ❑ Populate the different Working Groups and challenges.
- ❑ Nominate WG Coordinators.
- ❑ Start developing the R&D&I repository.

Thanks for your presence here today

Questions