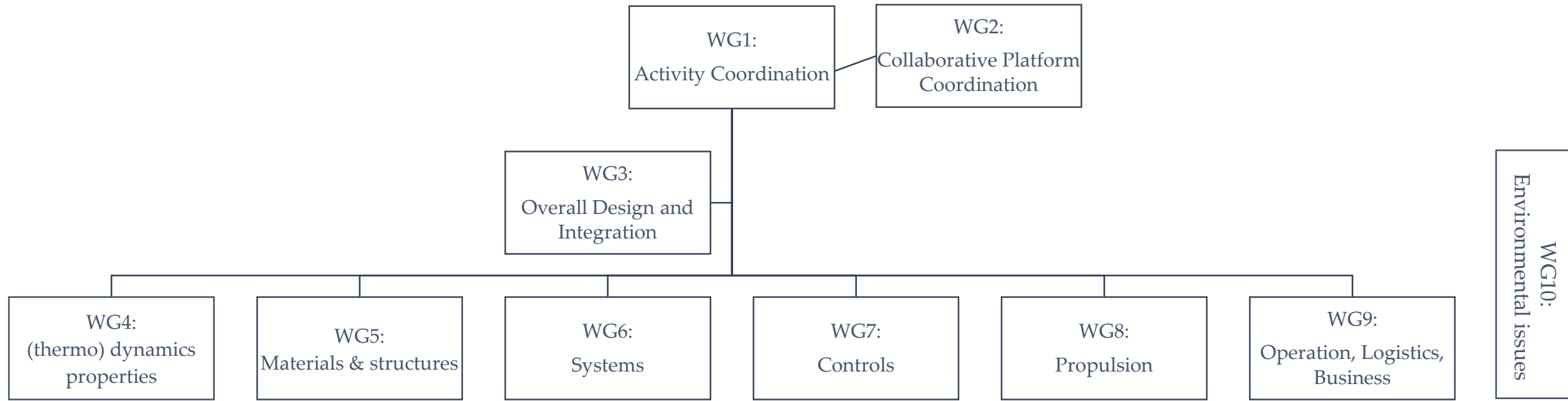


Nanosat Student Initiative (1st thoughts, September 3, 2019)

The student challenge: to design next-generation of nanosatellite(s) which combine new technologies and earth-observation challenges fulfilling Sustainable Development Goals. This will require detailed investigations among and across several disciplines where both experimental and modelling approaches are welcome. Potential sub-topics could include, among others:

- ***Thermal:*** thermal protection systems, insulation....
- ***Materials:*** light-weight materials development and characterization wrt thermo-mechanical fatigue, creep etc...
- ***Structures:*** static and dynamic behaviour of integrated, multi-purpose structures for the full application range; optimization of structural layout...
- ***Systems:*** design of on-board systems; electronics, power generation, communications and data links...
- ***Positioning & Propulsion:***
- ***Operation, Logistics, Business:*** network infrastructures and interfaces, launch planning, cost assessment for development-manufacturing-exploitation, commercial viability...
- ***Environmental issues:*** ...
- ***Overall Design and Integration***

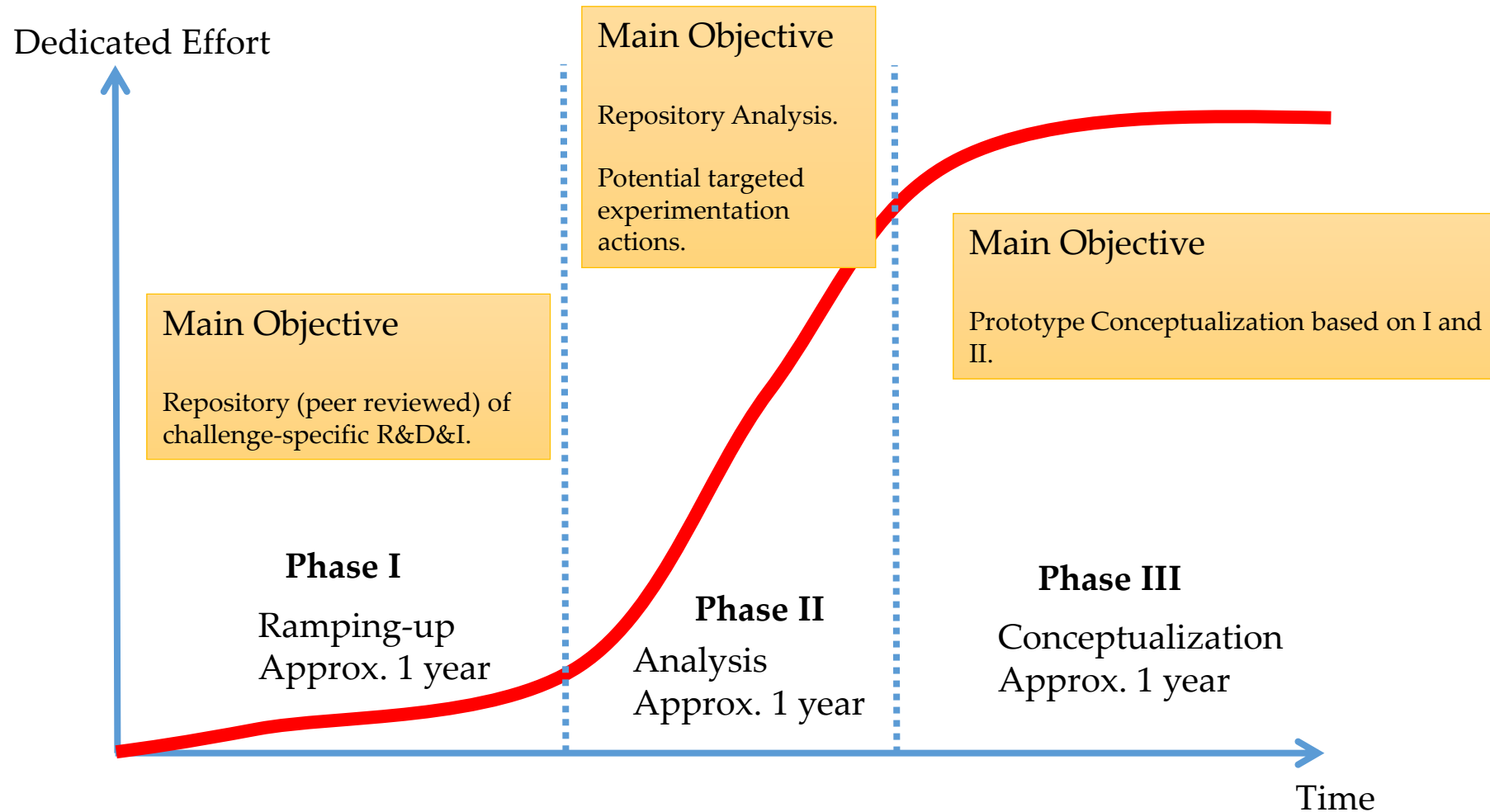
Possible Working Groups?



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

- Increased engagement of Universities
- 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 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/simulation 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

- **Existing and beyond** curricular activities in organizations.
- Enhanced collaborative platform.

Effort

- Each organization requires effort beyond “daily activities”.

Objectives

- After 3 years conceptualise a prototype of the future nanosat(s).

Modus Operandi

- 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).

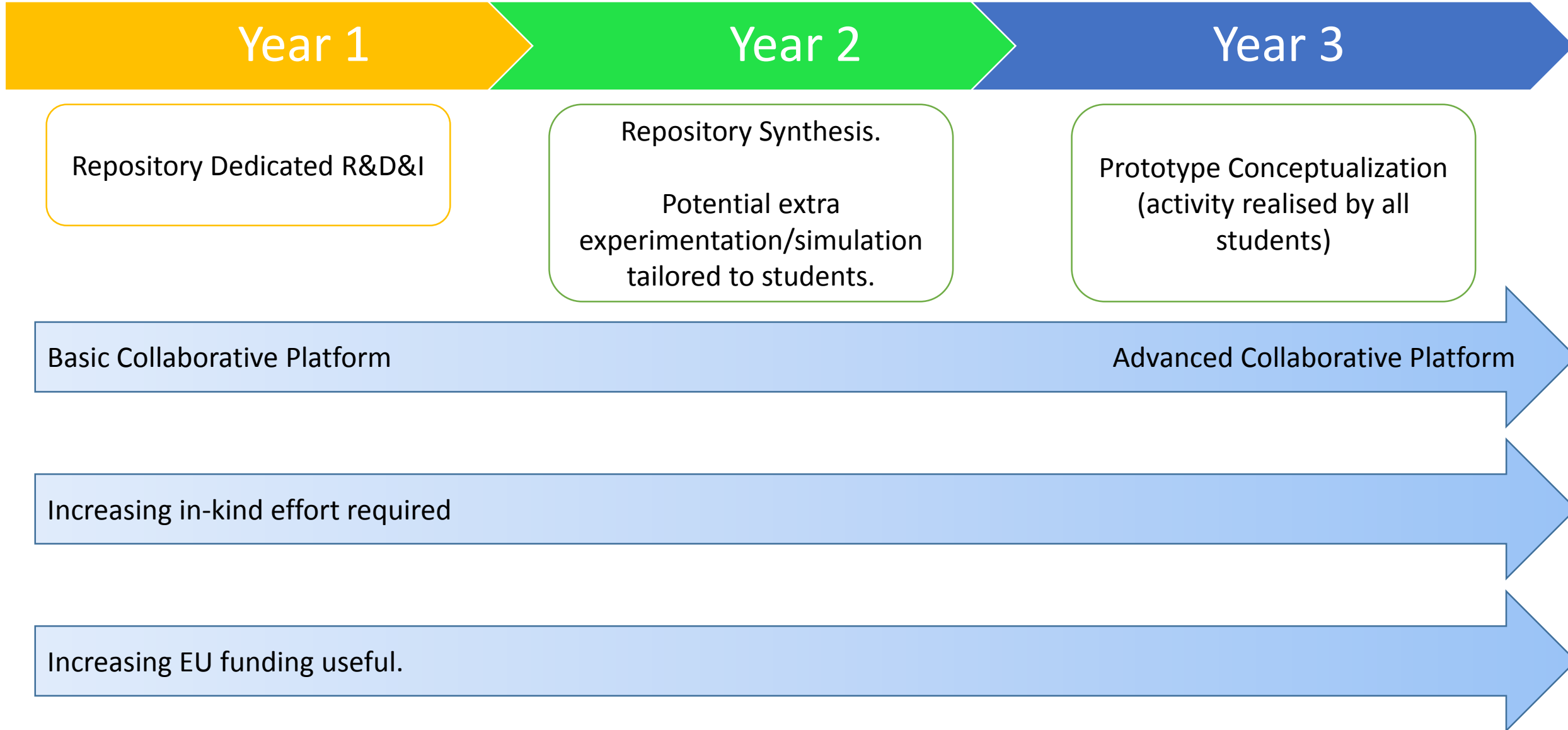
Nice to have

- EU funding to cover efforts related to conceptualization and potential experimentation/simulation 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 Meeting

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

