Finanziato dall'Unione europea
NextGenerationEU

Ministero dell'Università e della Ricerca

Italiadomani
PIANO NAZIONALE DI RIPRESA E RESILIENZA

INFN
Istituto Nazionale di Fisica Nucleare

EuAPS
1st Annual Meeting

INFN-LNS, 04/06/2025

EuPRAXIA
Advanced Photon Sources

WP.1
Project Management & Dissemination

Project Management perspective on EuAPS implementation and lesson learned from PNRR

INTRODUCTION

Project status, general overview and financial reporting already presented.

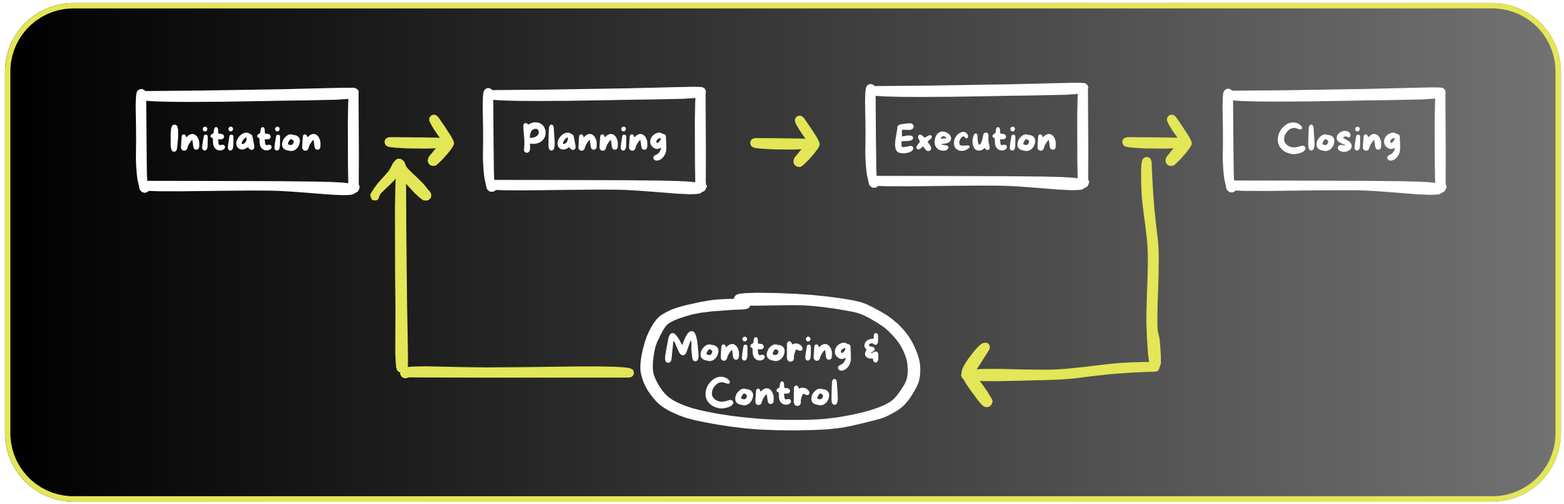
While the project is approaching the last months, it is time to reflect on the lesson learned and try to have a holistic perspective on how the project was prepared and executed.

Personal perspective, hopefully useful for a discussion and reflection. !

PM Best practices

The goal is to analyze the standard best practice in project management and how they have (or have not) been implemented and from there try to capture useful lessons learned and suggestion for future projects.

The typical life cycle of the project from the PMI standard is the following:



Initiation & Planning

Inititation & planning went in parallel on the submission of our proposal

The proposal was solid and well appreciated (1st ranked) with excellent comment from the evaluators.

We did not deviate from the original proposal. Project scope has been totally fulfilled.

→ Excellent job!!!

Boundary conditions:

- Only few weeks to prepare and plan the project.
- High Level WBS elaborated, but not a detailed project configuration (system design, layout, components).
- Very minimal support for the preparation
- Rules unclear that had an impact on the overall execution (31/12/2023 as deadline for the tender adjudication).
- 20% cut after "negotiation" → very minimal time for project remodulation.
- Few days after the submission of the proposal : Russia invasion in Ukraine and geopolitical scenario heavily affected

Initiation & Planning

Ambito ESFRI: **PSE**
Codice proposta **IR0000030**; Tipologia: **(ii) creation of a new RI**
IR, proponente e acronimo proposta: **EuPRAXIA (INFN): EuAPS**
Importo totale richiesto: **27.119.150€** di cui in quota Sud: **11.063.800,0€**
Responsabile Scientifico: **Massimo Ferrario**
Proponente: **Istituto Nazionale di Fisica Nucleare**
Co-Proponenti:
Università degli Studi di Roma "Tor Vergata
Consiglio Nazionale delle Ricerche - CNR

Esiti della valutazione

Ranking nel Panel: **1**
Punteggio complessivo: 191
Qualità scientifica: **50**; Impatto: **47**; Implementazione: **94**

Despite the difficulties to prepare such a complex grant in just few weeks the outcome has been outstanding!

we discovered later that it was just the beginning of a complicated journey

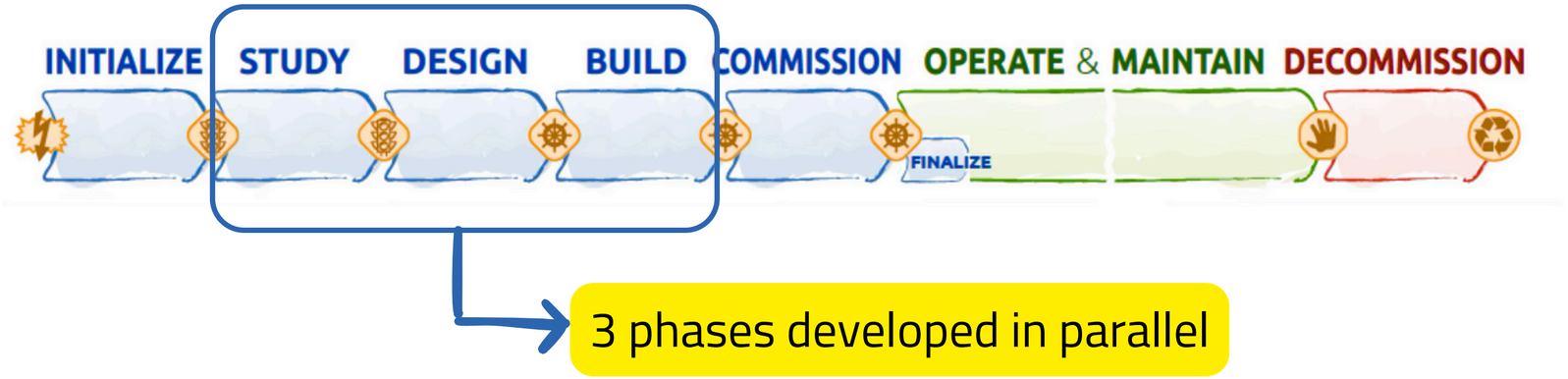
C.3 - robustezza e fattibilità nei tempi: **23** (min-max: 15 - 25)

Commenti al Punteggio: The description of the project management in this proposal is what one would expect for an outline project of the highest international standard. The proposal includes a detailed risk analysis, and an aggressive mitigation strategy, but the present geopolitical context is extremely volatile, and it is difficult to state with full confidence that the project will be delivered on time/on budget.

Initiation & Planning

It is evident that the boundary conditions since its inception highly affected the next phases. In particular the absence of an already approved TDR or at least an advanced engineering design made the assumption on the items to be procured rather unclear.

The standard approach of starting the implementation phase after a comprehensive design phase (openSE model) was not possible. Design & Procurement & Engineering all in parallel.



Execution

Scientific and technical execution proceeded very well.

High number of unexpected problem (or poorly estimated problem) essentially in the procurement phase.

Not having a definitive layout brought to unexpected expenses and a system engineering design progressing with the execution (design & procurement at the same time) made the implementation more complicated and at times a bit frustrating.

→ Excellent job!!!

Boundary conditions:

- Design and procurement at the same time is a risky activity
- Procurement rules somewhat over-regulating
- Change in the procurement law (codice appalti) → no visible advantage.

Monitoring & Control

Several layers of monitoring and control.

- Internal control at project management level:
  - Project meeting (every 2 weeks)
  - PMO Meeting (every month)

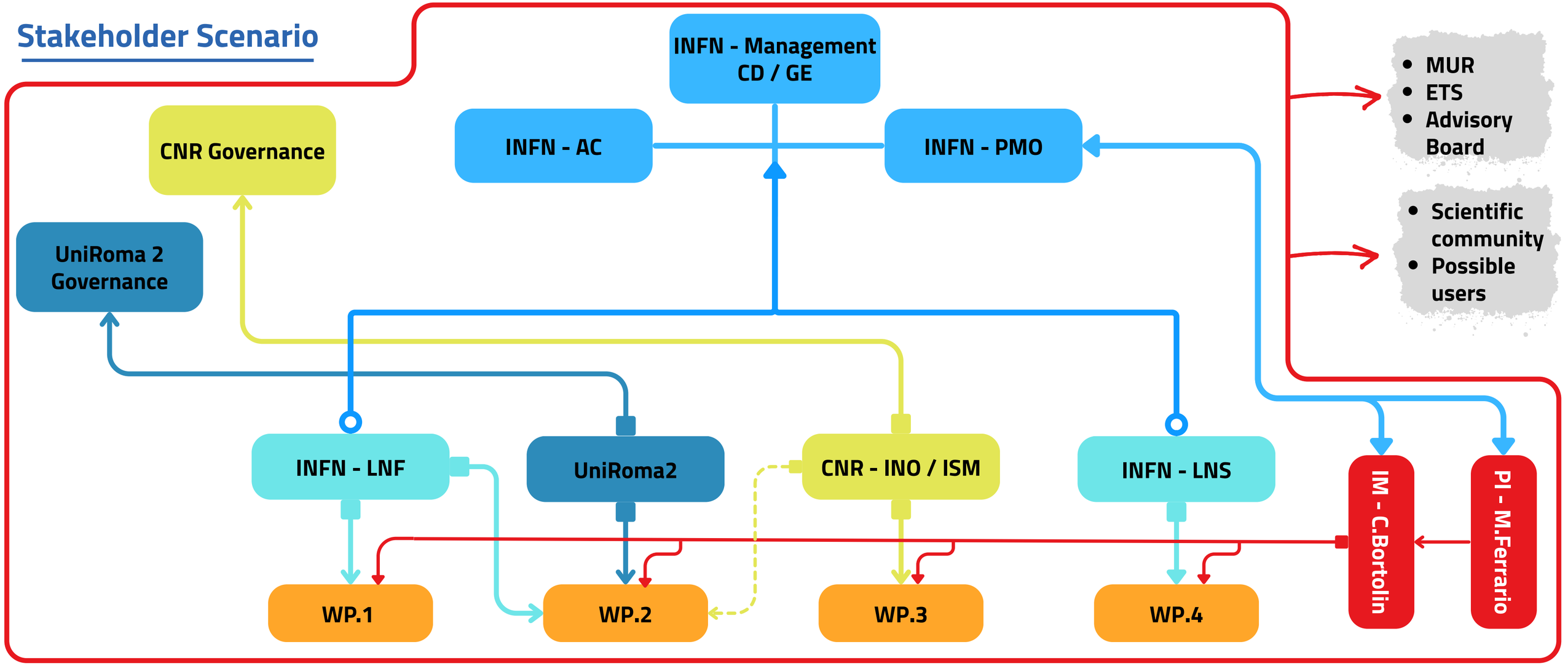
- Bi-monthly reporting with three different level:
  - Financial
  - Physical Advancement
  - Procedural advancement.

→ Quite stringent process and often last minute alignment required

Change management

Readjusting the baseline w.r.t. actual status of the project is possible within certain limit and with a quite time-consuming approval process which slow down the execution.

Stakeholder Scenario



Stakeholder Scenario

- Highly articulated and complex stakeholder scenario and governance framework.
- Several bodies at different levels played an important role in the project execution
- Although each role was important and effective, the chain of command was at times overly long and complex, making it difficult to manage efficiently.
- In any case the committment and effort of all the bodies played an indisputable role in the project success.

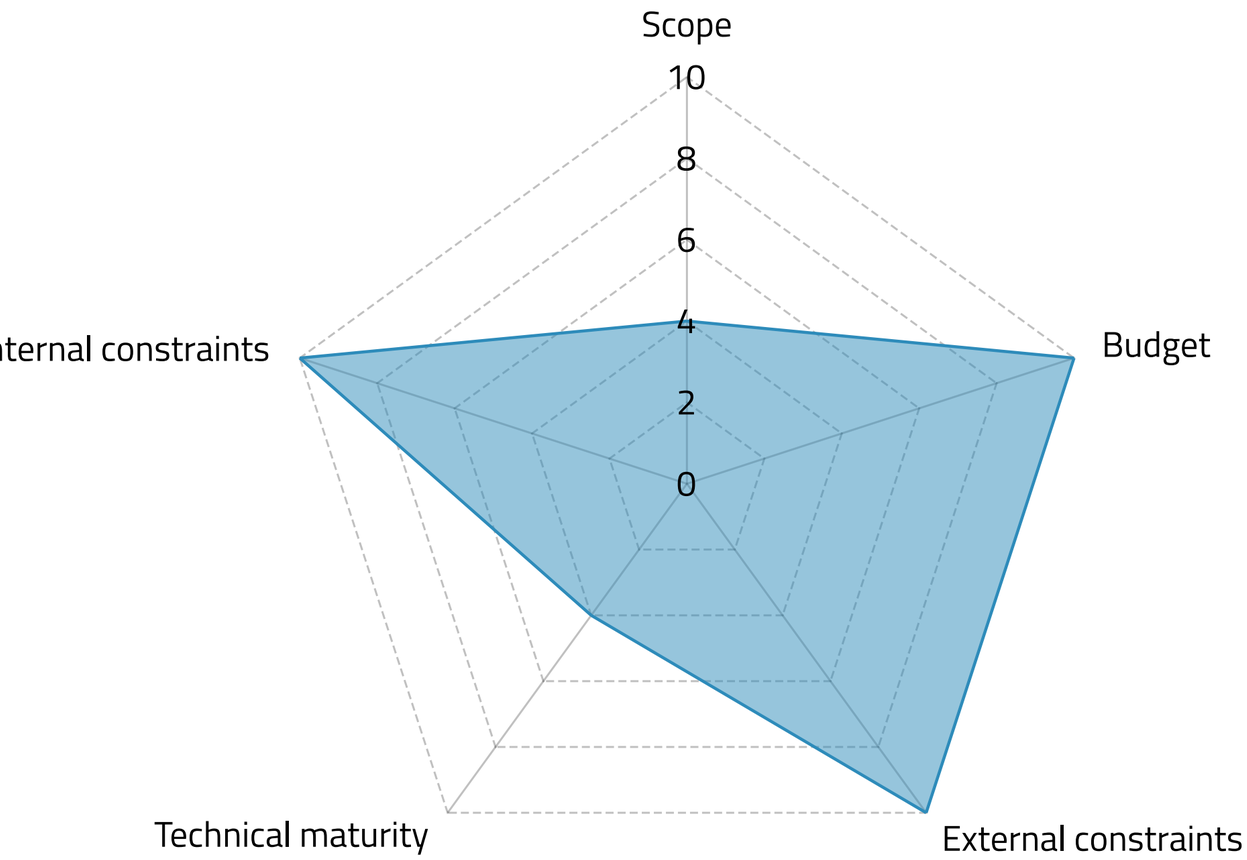
Boundary conditions

5 dimensions that constrained and shape the project:

- Scope
- Budget
- External constraints
- Technical maturity
- Internal constraints

From 0 (full adaptative) to 10 (full predictive)

Scope and technical development heavily constrained by rules and budget limits



What was difficult

Bureocracy

Ad-hoc procedures many of them new (e.g. DNSH)
Procurement law was changed in the course of the project
New procurement tools
Highly regulated reporting rules.

Unclear rules

None of them provided a significant advantage or simplification they rather add a layer of complexity and uncertainty.
Heavy bureocracy lead to uncertainty and unclear procedures (especially at the beginning)

Over-reporting

While it is understandable a certain degree of control over the project execution from the funding agency, it seems a bit over-regulated and not in line with other funding lines (Horizon Europe Funding, EFRD funds, regional funding).

From one side it helped to keep a good pace on the project, on the other hand it absorbed a remarkable amount of work for report preparation.

In contrast with the emerging principle ***"Trust first, scrutinize later"*** in the EU Context

Lesson Learned

External constraints imposed severe boundary conditions.

Some of them were unexpected and others might be better anticipated. A strict project management approach has to be compensated with a good amout of:

Flexibility

Ability to adapt quickly to unexpected problems.

Resilience

Being persistent in facing bureocratic issues (e.g. signature of the contracts)

Creativity

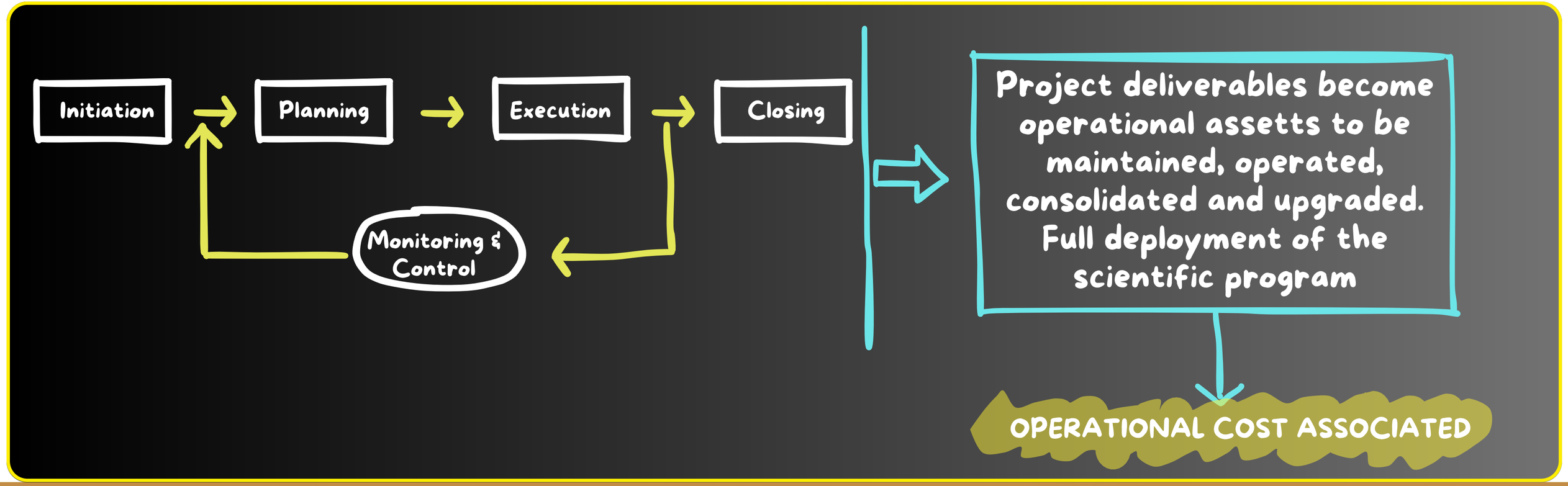
Find alternative solution to solve unexpected problems.

Team spirit

Committment from all the project members to work together...and answer to last-minute requests!

Project closure - What next?

A project completed is not the end of the story it is rather the beginning of a new one.



What next?

EuAPS is about to become fully functional facilities based on different labs.
It is crucial that the work done so far will be supported in the future for a proper operation and consolidation.

EuAPS represents the first building block of EuPRAXIA initiative and if the operational phase will be fully supported it will mark a significant milestone in the EuPRAXIA implementation.

ESFRI committments : within 2031 EuPRAXIA should become a functional facilities. Having at least one set of scientific program completed it certainly will be a remarkable achievement.

Correlation with EuPRAXIA Conceptual Design Report

2.1.2 Flagship Science Goals

Flagship Science Goal 1: EuPRAXIA will deliver free-electron laser (FEL) X rays with 10^9 – 10^{13} photons per pulse to user areas, covering wavelengths of 0.2 nm to 36 nm. The EuPRAXIA FEL pulses are naturally short (down to 0.4 fs) and will therefore provide users with tools for investigating processes and structures in ultra-fast photon science at a reduced facility foot print.

→ **EuPRAXIA@SPARC_LAB**

Flagship Science Goal 2: EuPRAXIA will deliver betatron X rays with about 10^{10} photons per pulse, up to 100 Hz repetition rate and an energy of 5-18 keV to users from the medical area. The much reduced longitudinal length of the X ray emission area (point-like emission) leads to an important improvement in image resolution compared to other techniques.

→ **EuAPS @ LNF**

- **High Power Laser Beamline (@INFN-LNS)**
- **High Repetition Rate Laser Beamline (@CNR-INO)**

→ **Functional to flagship science goal 6 and 7**

Conclusions

Standard PM methodologies can be applied with some limitations and in any case they have to be highly adaptative given the external constraints and real-life scenario. They help to navigate in a complex scenario, but it is impossible to apply blindly methodologies without considering the boundary conditions.

External constraints imposed by funding agencies don't allow a full predictive approach and a remarkable amount of flexibility is required

Bureocracy is a limiting factor (as it should be), there's nothing we can do about it, but we can anticipate problems.

As in an orchestra, all the players should work in synchronous to make things happens.