

Project Control & Follow-up with openSE

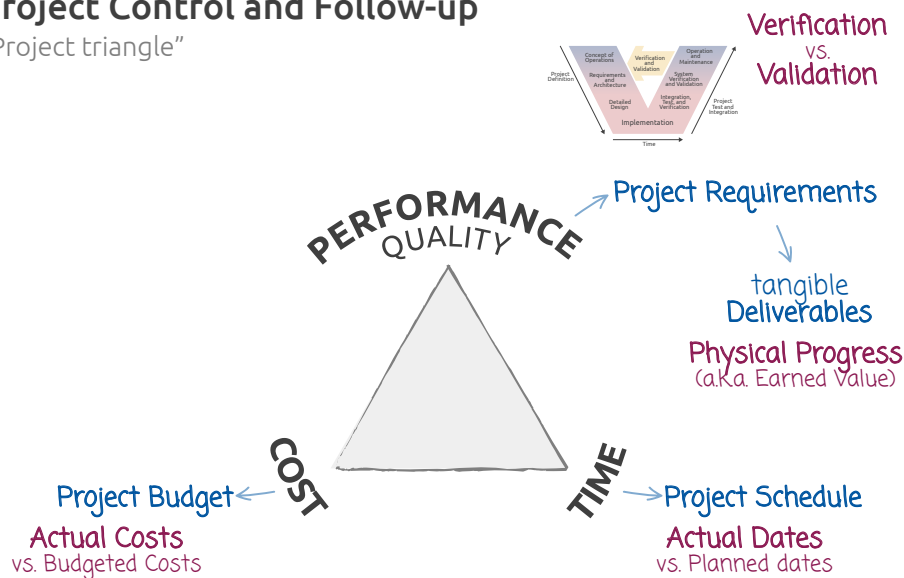
Part 5

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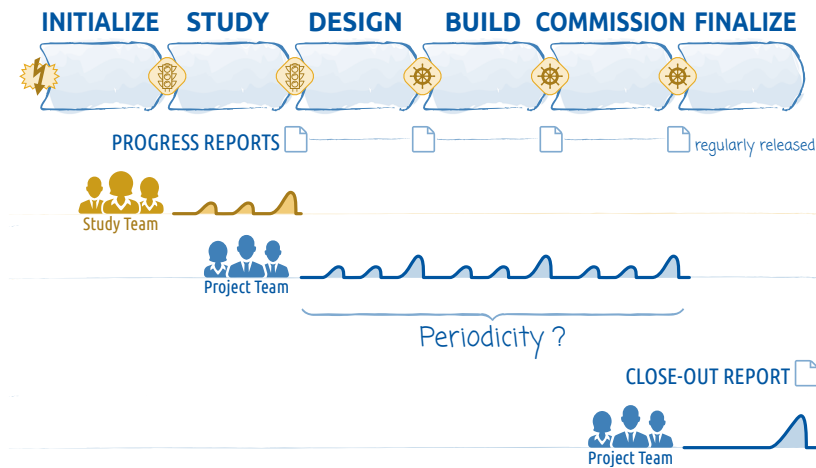
Project Control and Follow-up

"Project triangle"



Project Control and Follow-up

When and which effort?



Project Control and Follow-up with openSE

3 levels of implementation

3. **Advanced** approach
2. **Intermediate** approach
1. **Simple** approach

 The preferred project control and follow-up approach shall be defined in the Project Management Plan

The 'simple toolbox'

Project Control and Follow-up

The 'basic toolbox'

SIMPLE
approach



- 1 Major achievements (as bullet points)
- 2 Problems encountered
- 3 Cost and schedule statuses
 - 3.1 Cost status
Table (actuals vs. budgeted)
 - 3.2 Schedule status
Milestone Trend Chart
(**Milestone Plan**)
 - 3.3 Physical progress status
Dashboard
- 4 Work laying ahead (as bullet points)
- 5 Risk Register update (limited to changes)

Project Costing

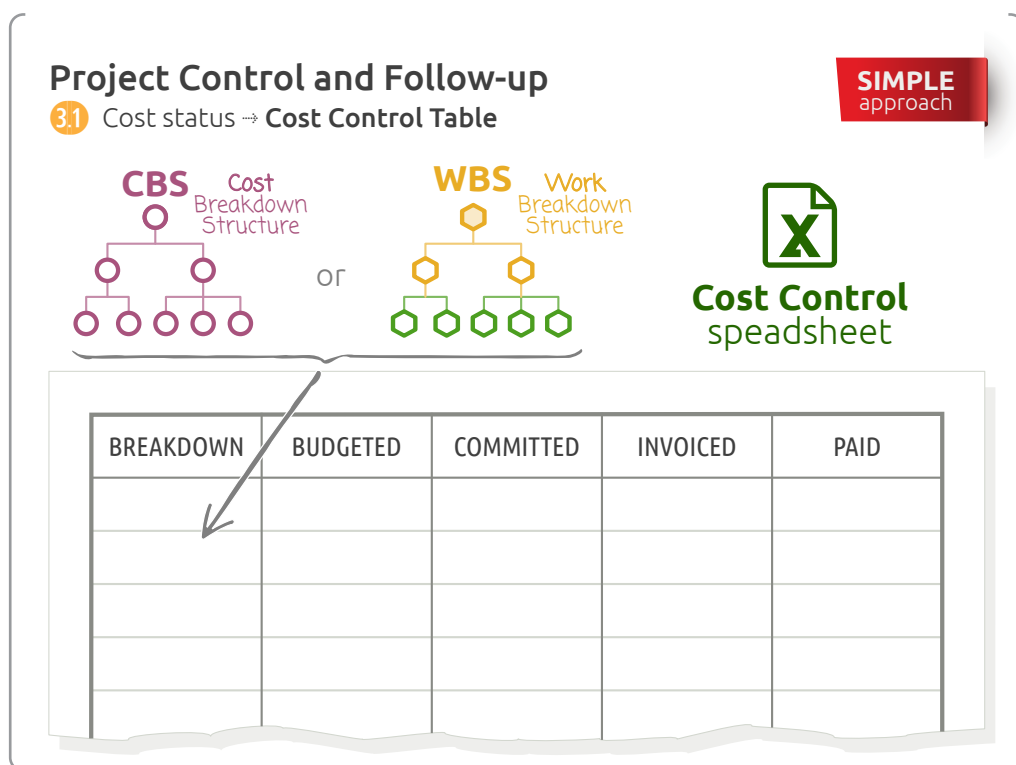
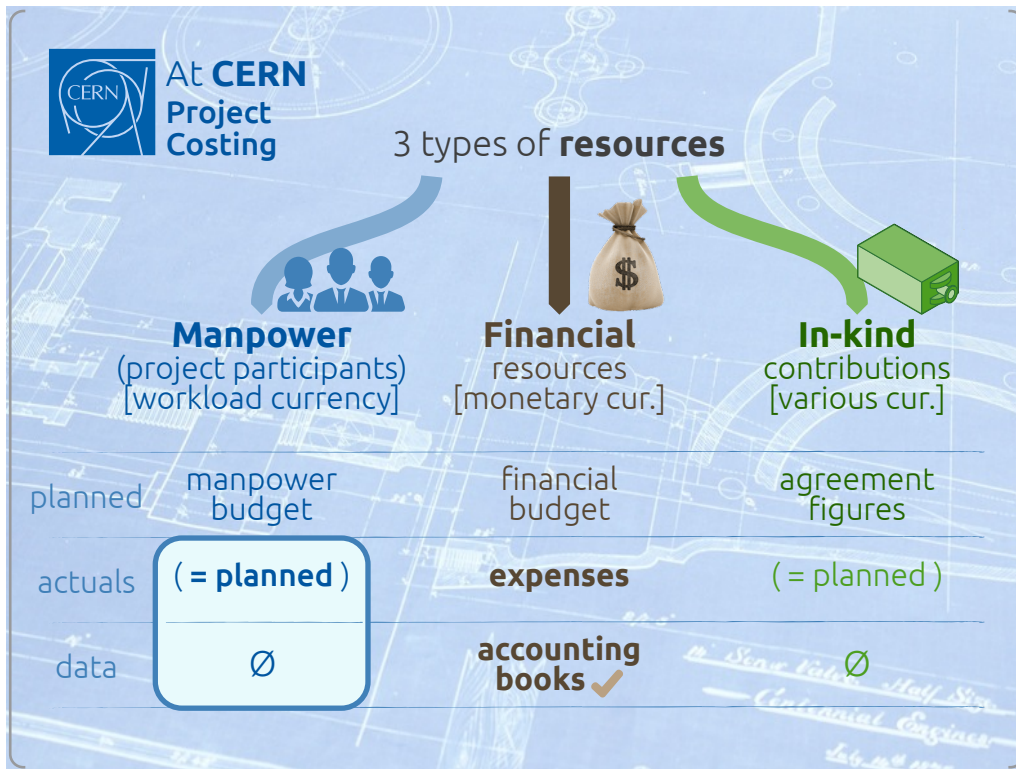
3 types of **resources**

Manpower
(project participants)
[workload currency]

Financial
resources
[monetary cur.]

In-kind
contributions
[various cur.]

planned	manpower budget	financial budget	agreement figures
actuals	time spent	expenses	(= planned)
data	timesheeting system ⚠	accounting books ✓	Ø

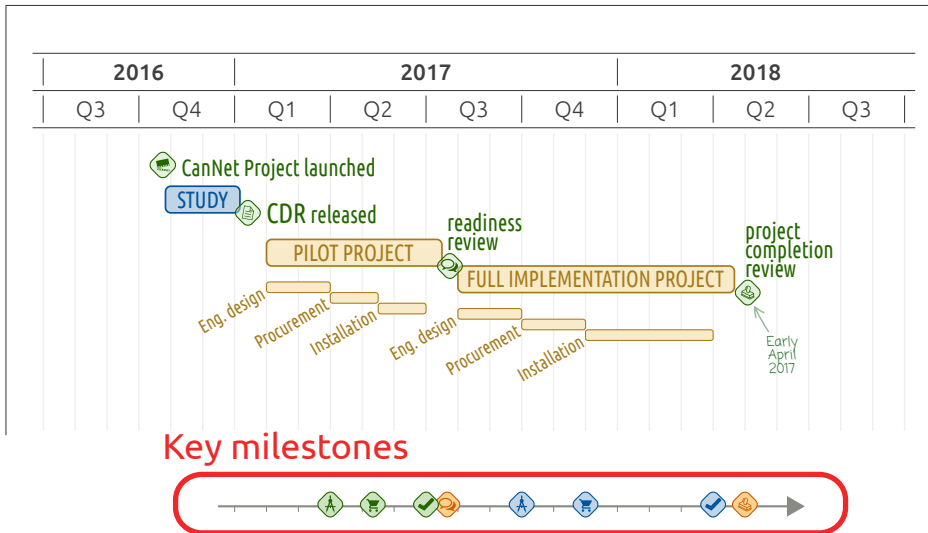


Milestone Trend Chart

Project Control and Follow-up

32 Schedule status → Milestone Trend Chart

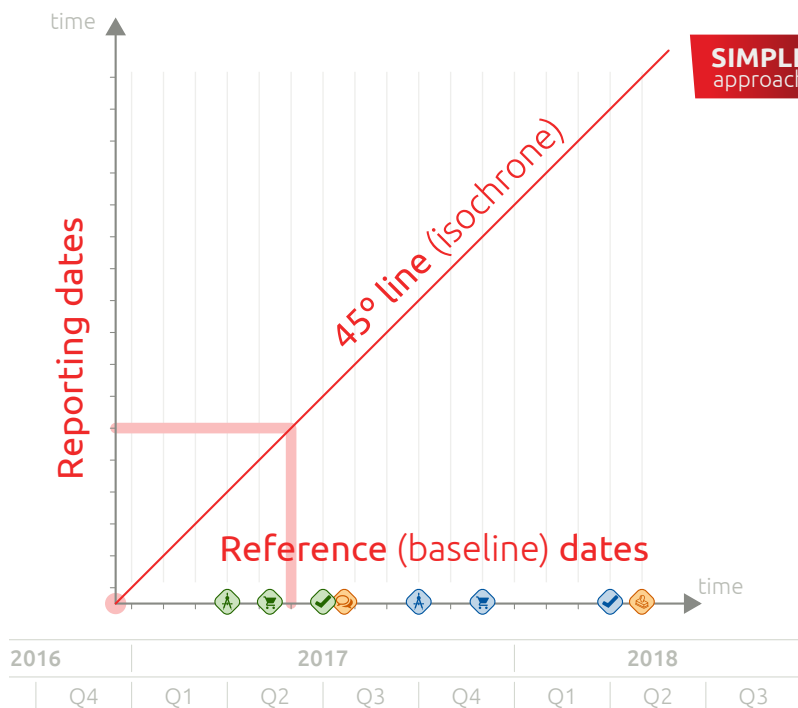
SIMPLE
approach



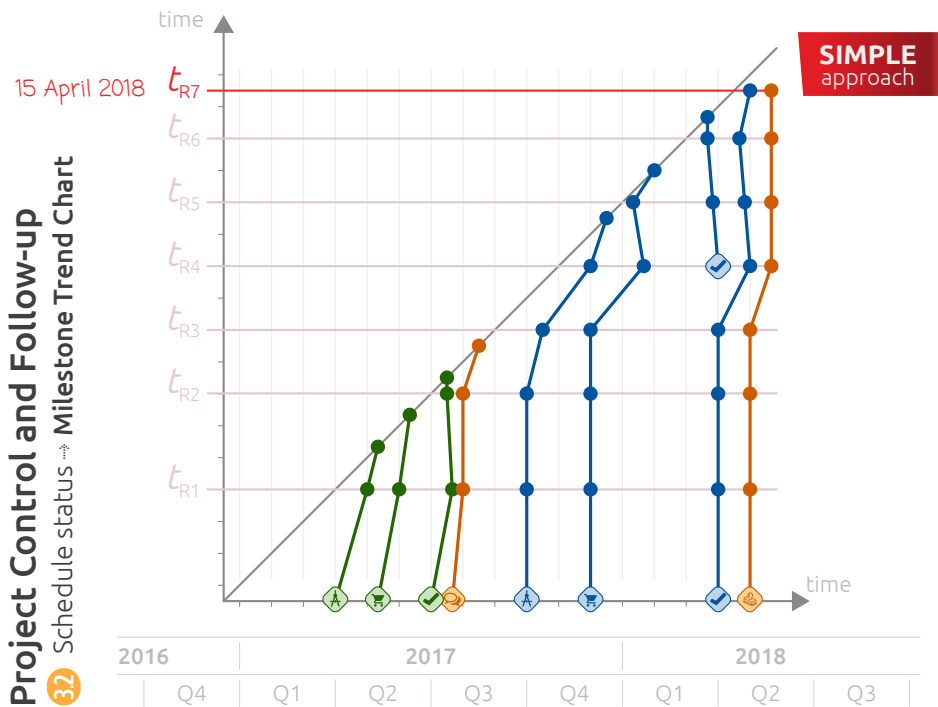
The CanNet Pilot Project

Project Control and Follow-up

32 Schedule status → Milestone Trend Chart



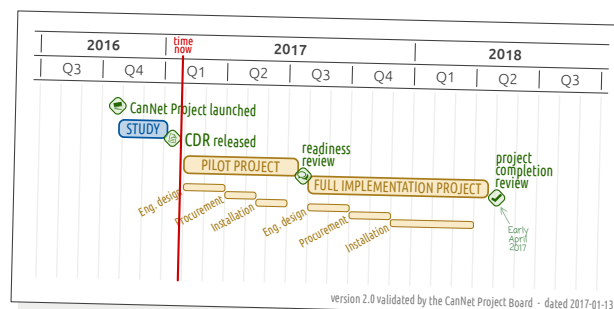
SIMPLE
approach



Milestone Plan

Project Control and Follow-up

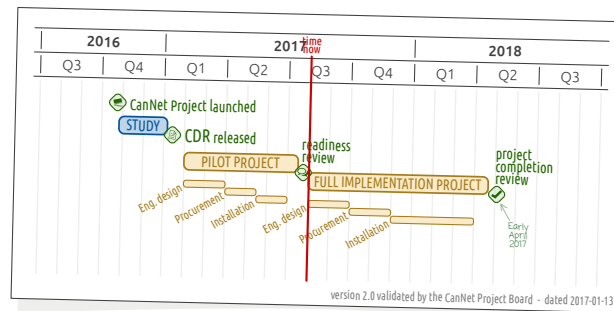
3.2 Schedule status
Milestone Plan
© gdpm



DATE	Project Board	Eng. Team	Proc. Team	Site Activities	MILESTONE DESCRIPTION
31.01	PPL				When the CanNet Pilot Project is formally launched by the Project Board
31.03		Eng			When the engineering design tasks of the Pilot Project are completed
15.05			Proc		When the procurement contract is signed
30.06				Inst	When the installation and commissioning works for the three tanks are completed
15.07	PPR				When the CanNet Project Readiness Review is held
31.10		Eng2			When the engineering design tasks of the Full Implementation Project are completed

Project Control and Follow-up

3.2 Schedule status
Milestone Plan
© gdpm



31.07.2017

DATE	Board	Eng. Team	Proc. Team	Site Activities	MILESTONE DESCRIPTION
31.01	PPL				When the launch is planned
31.03		Eng			When the Pilot Project is launched
15.05			Proc		When the Procurement is planned
30.06				Inst	When the works for installation are planned
15.07	PPR				When the CanNet Project Readiness Review is held
31.10		Eng2			When the engineering design tasks of the Full Implementation Project are completed

Planned

On-going

Completed

Late

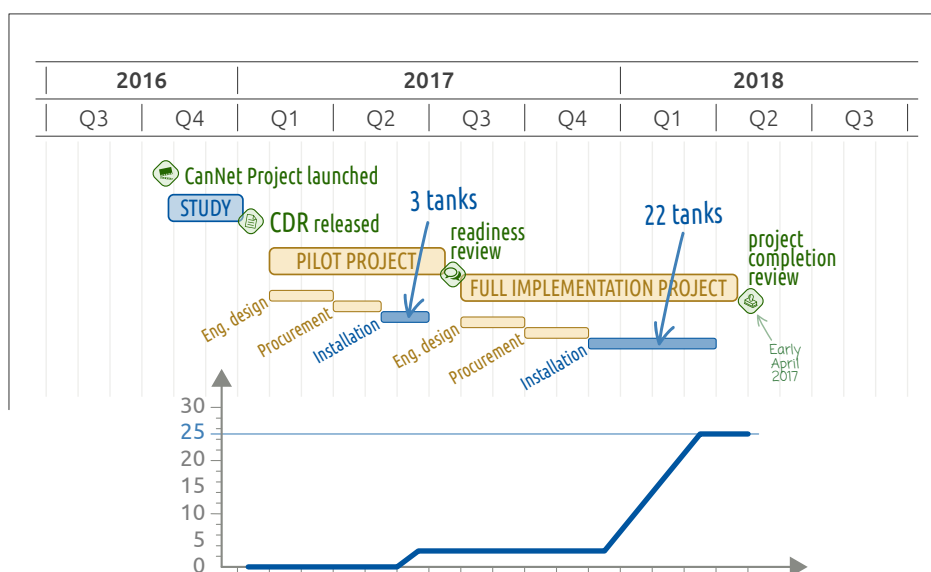
Critical

Progress Dashboard

Project Control and Follow-up

3.3 Physical progress status → Dashboard

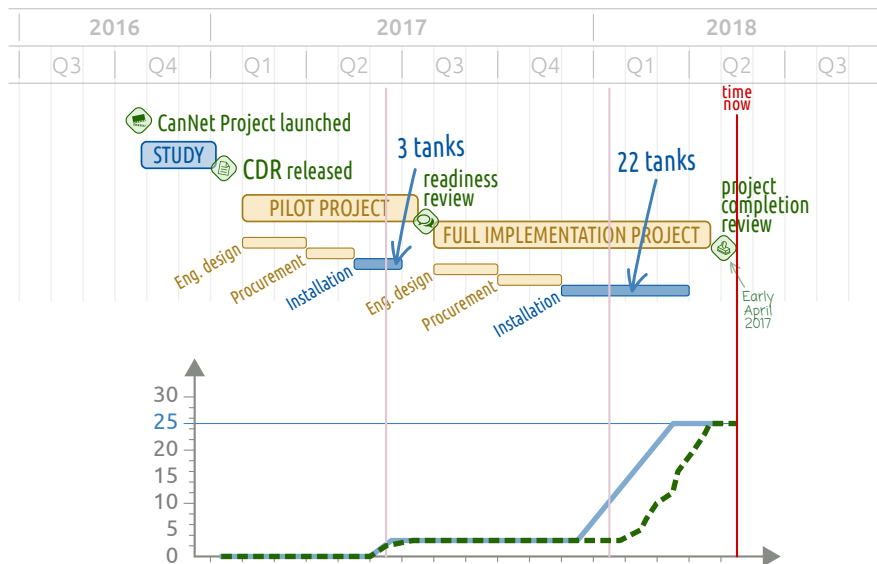
SIMPLE
approach



Project Control and Follow-up

3.3 Physical progress status → Dashboard

SIMPLE
approach



Project Control and Follow-up

The 'basic toolbox'

SIMPLE
approach

INTERMEDIATE
approach

ADVANCED
approach



- 1 Rationale
- 2 Major Achievements
- 3 Risks and Issues
- 4 Cost and Schedule
 - 4.1 Cost status
Table (actuals vs. budgeted)
 - 4.2 Schedule status
Milestone Trend Chart
 - 4.3 Physical progress status
Dashboard
- 5 Lessons Learned

The 'intermediate toolbox'

Project Control and Follow-up

The 'intermediate toolbox'

INTERMEDIATE
approach

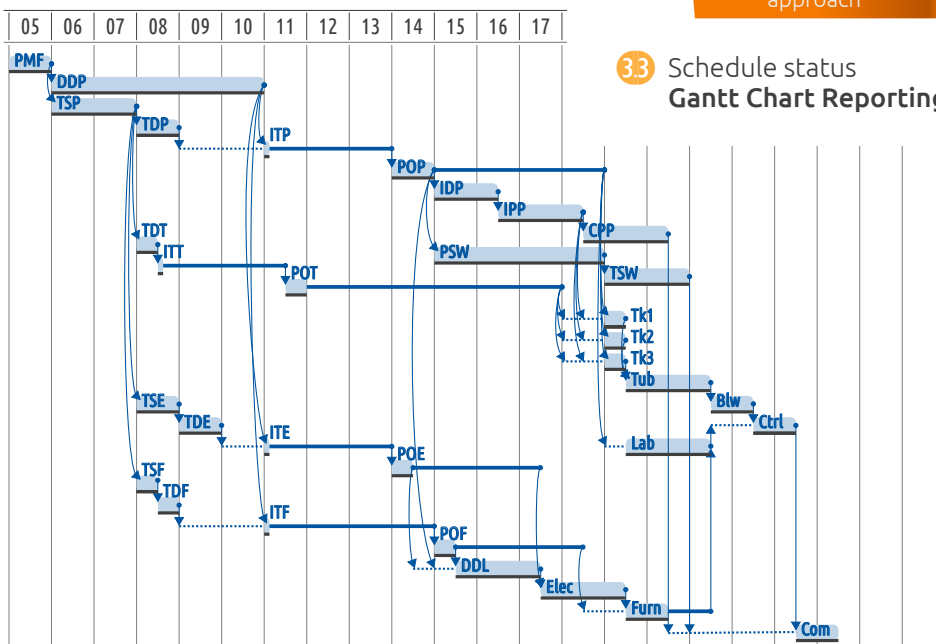


Gantt Chart Reporting

Project Control and Follow-up

INTERMEDIATE
approach

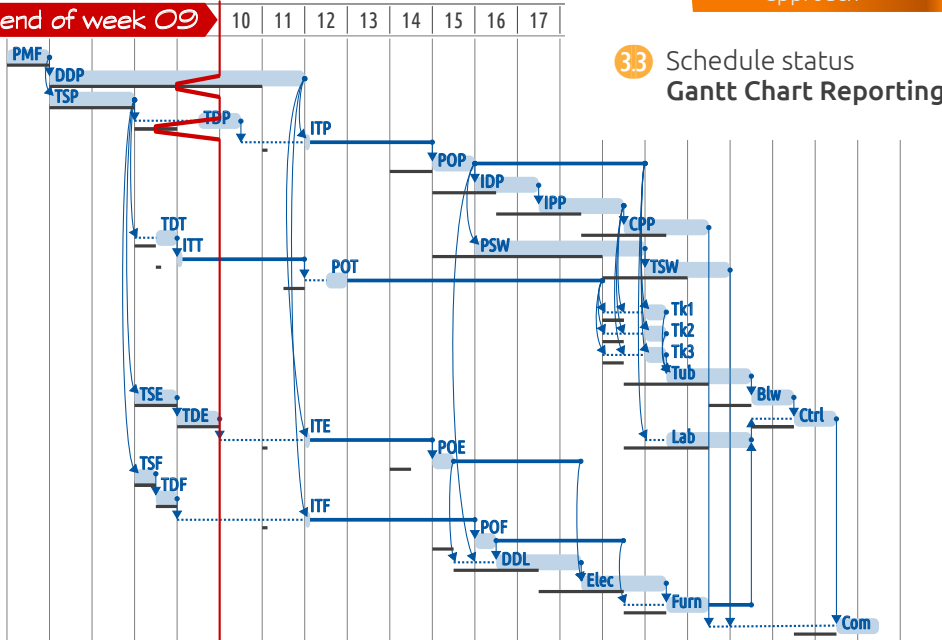
3.3 Schedule status
Gantt Chart Reporting



Project Control and Follow-up

INTERMEDIATE approach

end of week 09



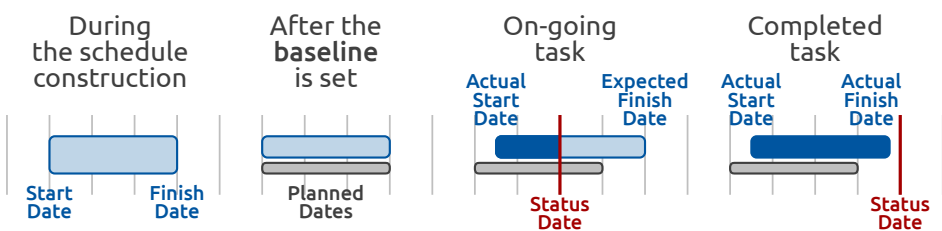
3.3 Schedule status
Gantt Chart Reporting

Project Control and Follow-up

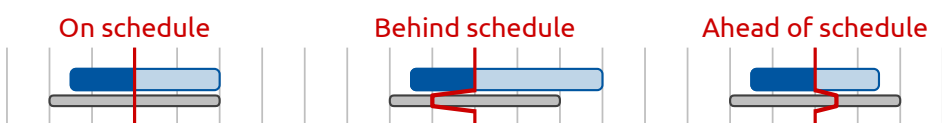
INTERMEDIATE approach

3.3 Schedule status → Gantt Chart Reporting

⇒ Reporting principles implemented in most project scheduling software:



⇒ Meaning of the **status line** (isochrone line*):





* A line drawn on a Gantt chart connecting points (tasks) at which something occurs or arrives at the same time

Project Control and Follow-up

3.3 Schedule status → Gantt Chart Reporting

INTERMEDIATE
approach

At a given **status date**, the focus is given on tasks that either **are on-going** () or that **should be on-going** ()

As a driving principle, duration of planned tasks (i.e. ) is not re-evaluated with each schedule status report

Earned Value Management

Earned Value Management

Earned Value Analysis 

creation



1969



1996

PMI

Practice Standard for
Earned Value Management



2005

American Military Standard

C/SCSC

Cost/Schedule Control
System Criteria



American National
Standard Institute



Electronic
Industries
Alliance

ANSI/EIA-748-C

NDIA

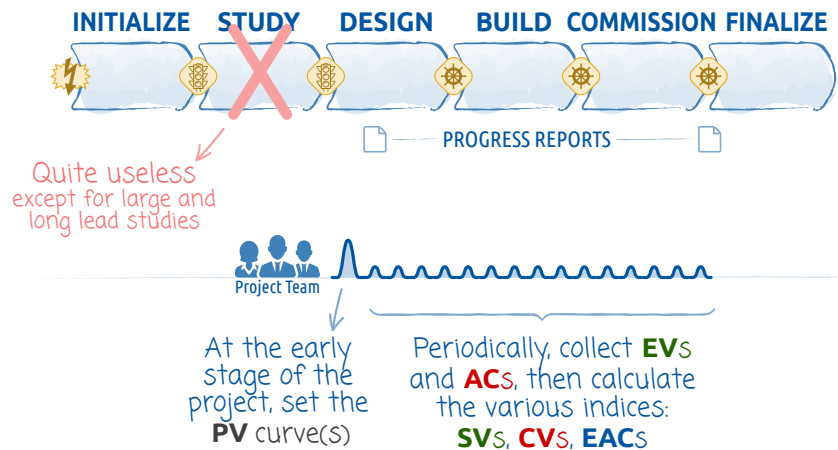
National Defense
Industrial Association

32 criteria/guidelines to consider

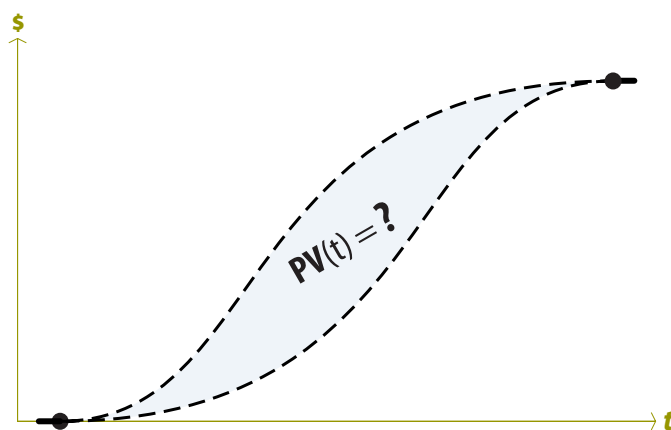
Earned Value Management

When and which effort?

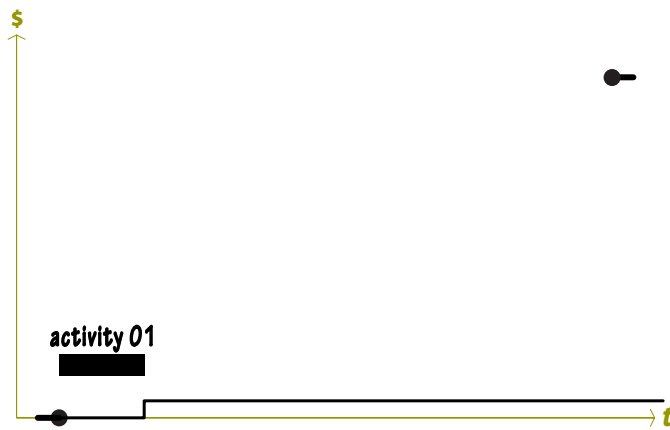
INTERMEDIATE
approach



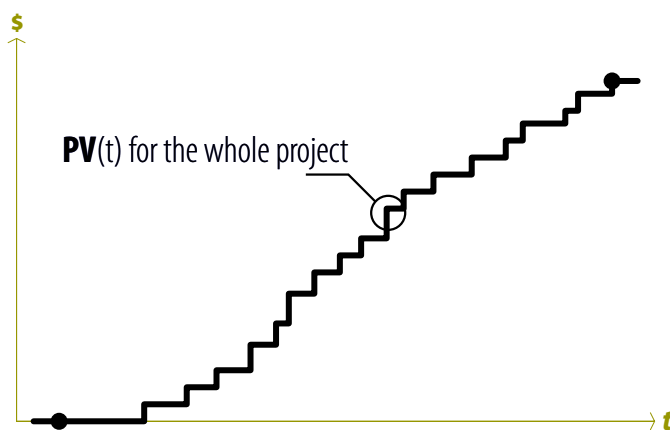
EVM Basics



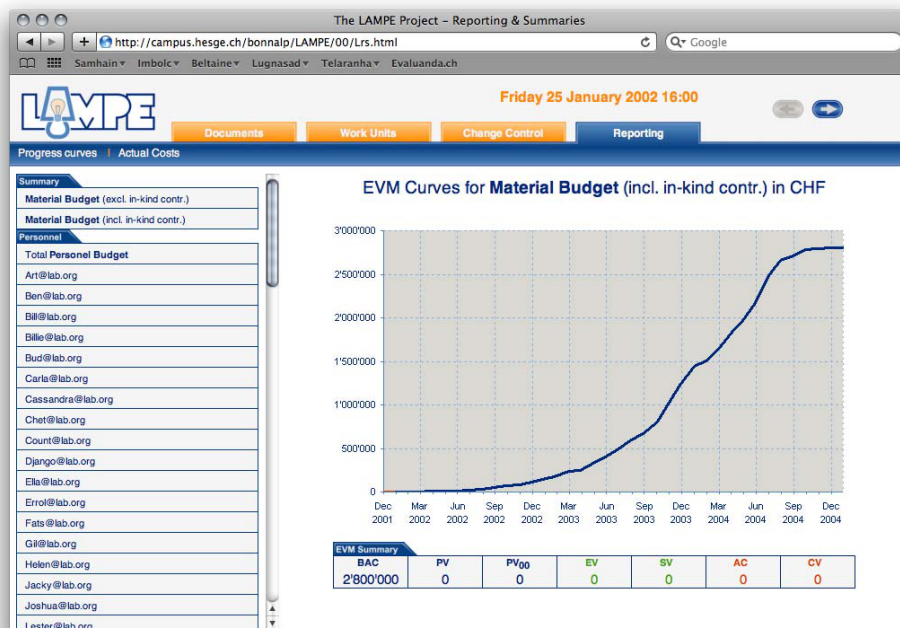
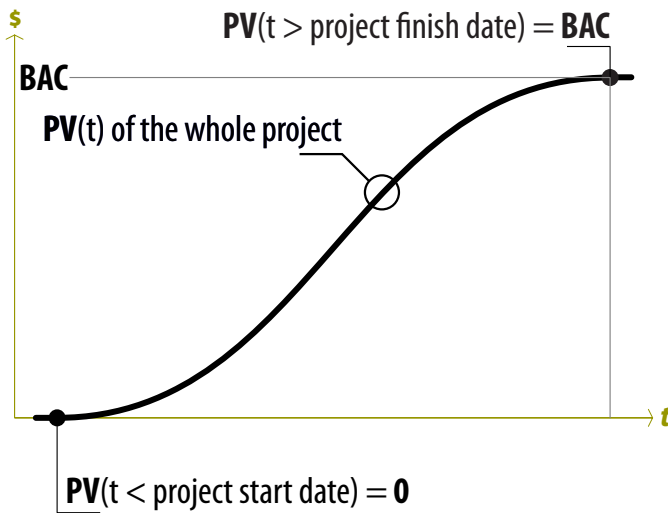
EVM Basics



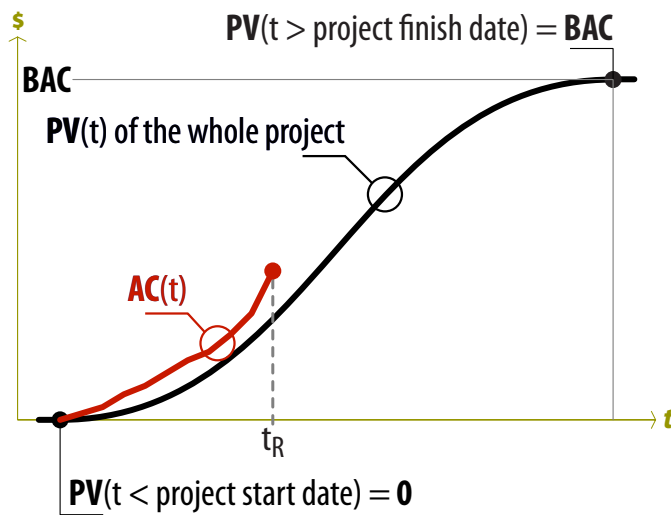
EVM Basics



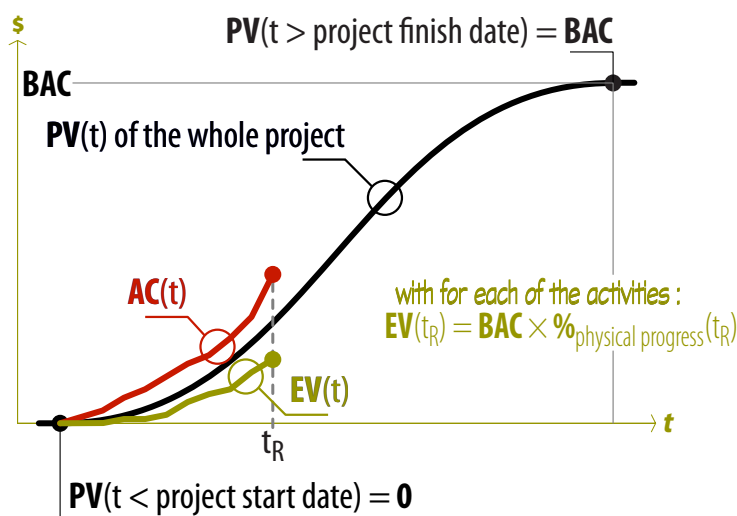
EVM Basics → PV, Planned Value



EVM Basics → AC, Actual Costs



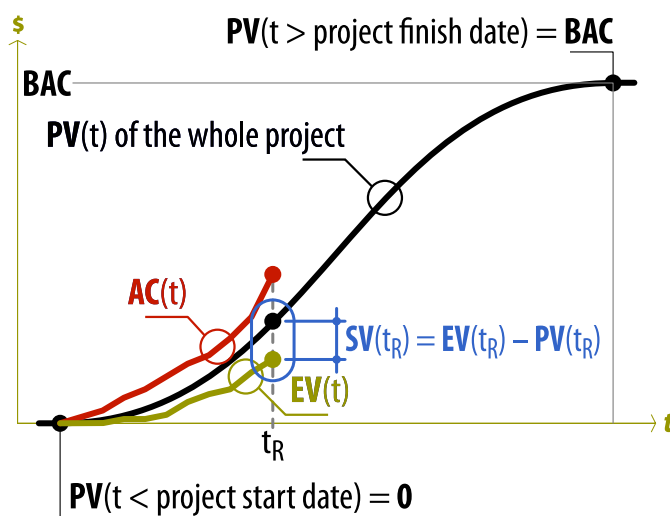
EVM Basics → EV, Earned Value



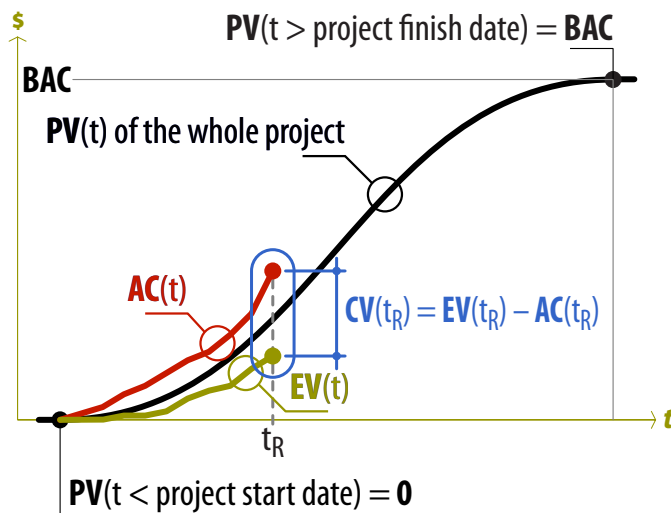
EVM Basics

AFITEP	C/SCSC	ANSI #748
CBTP Coût budgété du travail prévu	BCWS Budgeted Cost of the Work Scheduled	PV Planned Value
CRTE Coût réel du travail effectué	ACWP Actual Cost of the Work Performed	AC Actual Cost
CBTE Coût budgété du travail effectué	BCWP Budgeted Cost of the Work Performed	EV Earned Value
CTB Coût total budgété	BAC Budget at Completion	BAC Budget at Completion

EVM Basics → SV, Schedule Variance



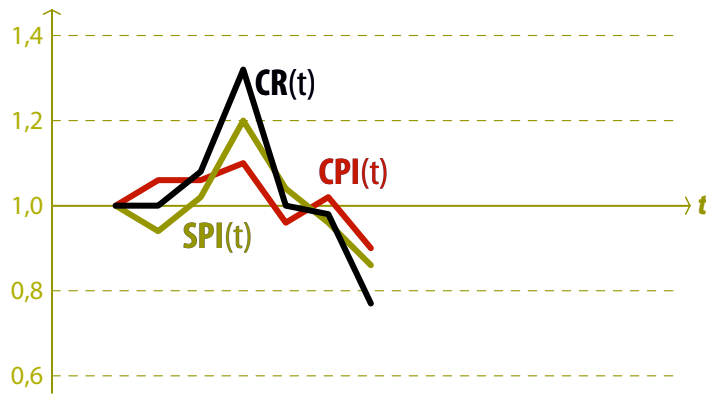
EVM Basics → CV, Cost Variance



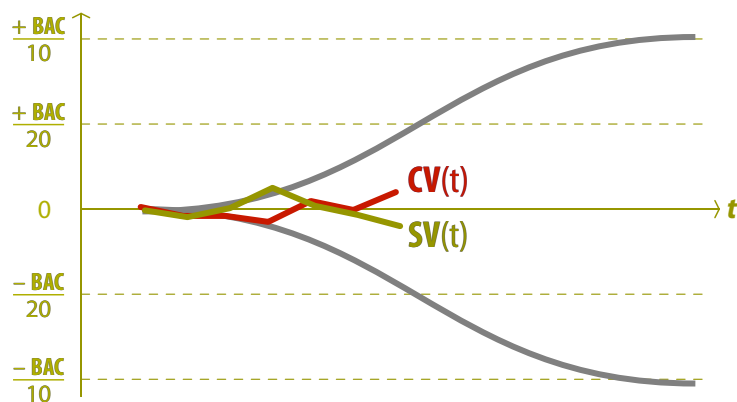
EVM Basics

Schedule Variance $SV(t_R) = EV(t_R) - PV(t_R)$	Cost Variance $CV(t_R) = EV(t_R) - AC(t_R)$
Schedule Performance Index $SPI(t_R) = \frac{EV(t_R)}{PV(t_R)}$ <div> $SPI(t_R) > 1$ 😊 $SPI(t_R) < 1$ ☹️ </div>	Cost Performance Index $CPI(t_R) = \frac{EV(t_R)}{AC(t_R)}$ <div> $CPI(t_R) > 1$ 😊 $CPI(t_R) < 1$ ☹️ </div>
Critical Ratio $CR(t_R) = SPI(t_R) \times CPI(t_R)$	Physical Progress $\varphi(t_R) = \frac{EV(t_R)}{BAC}$

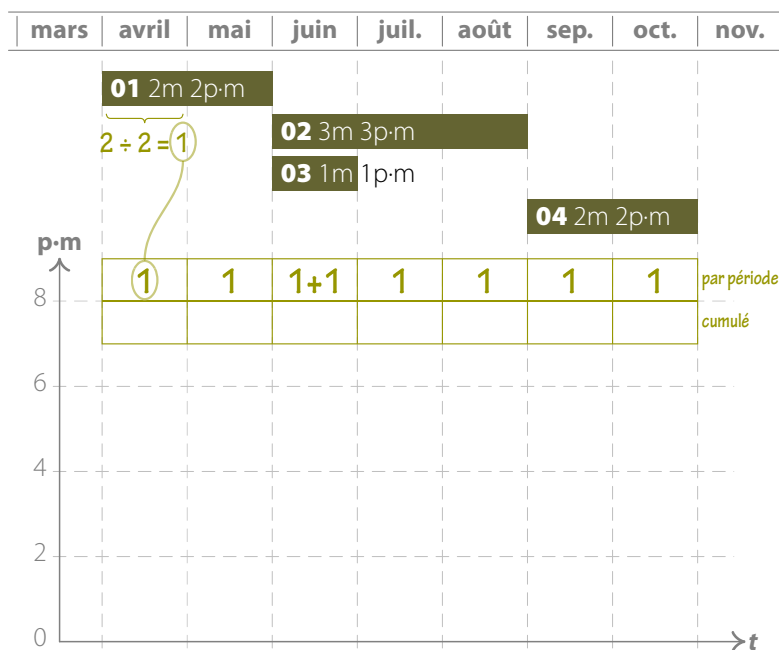
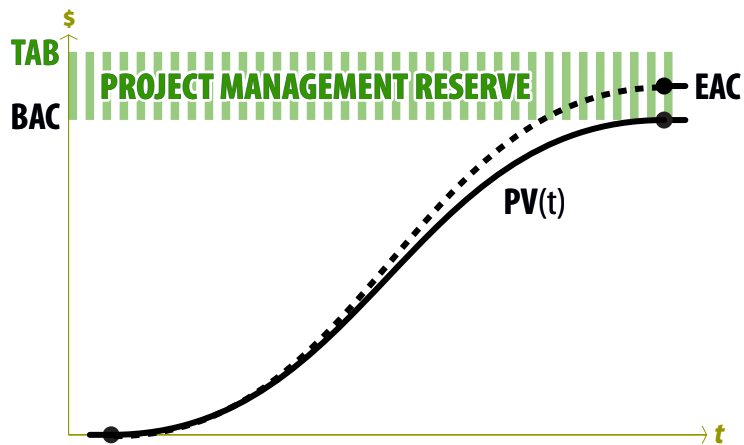
EVM Basics

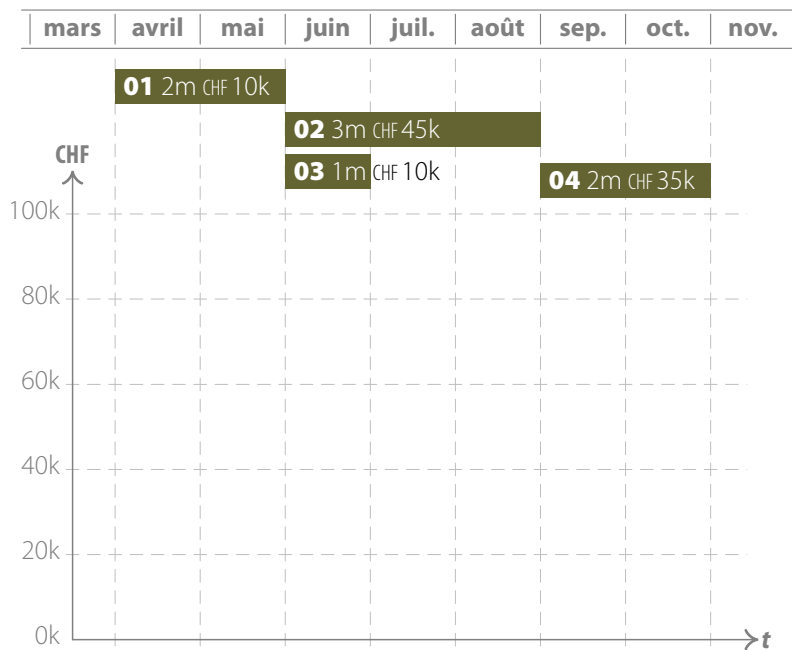
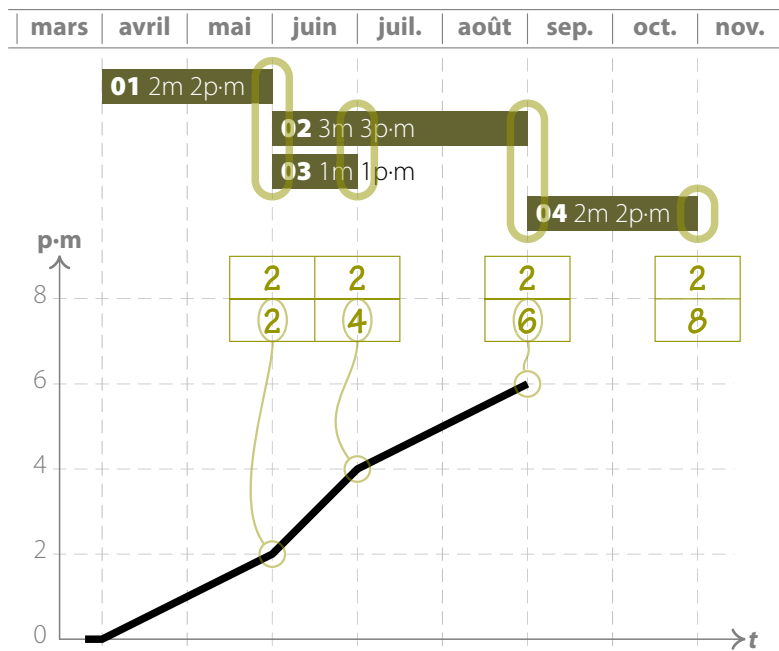


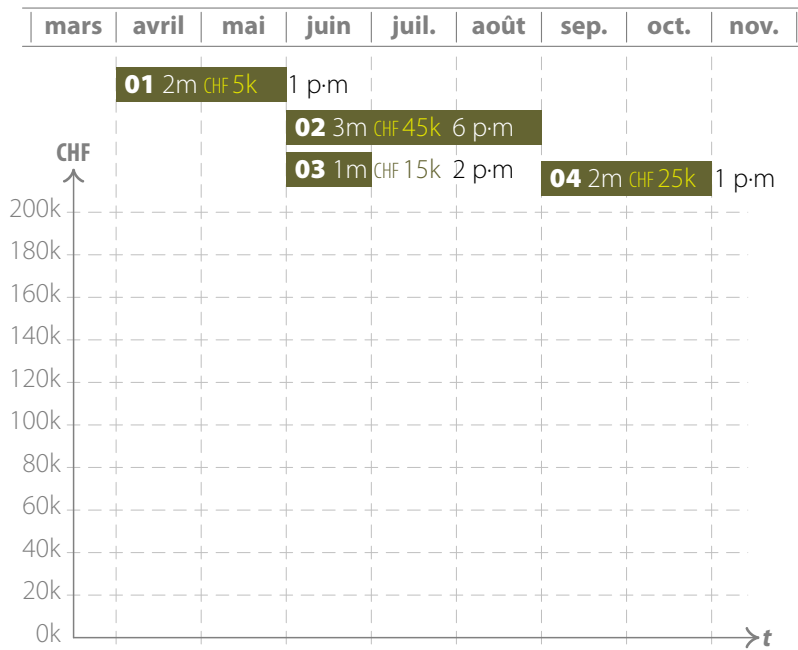
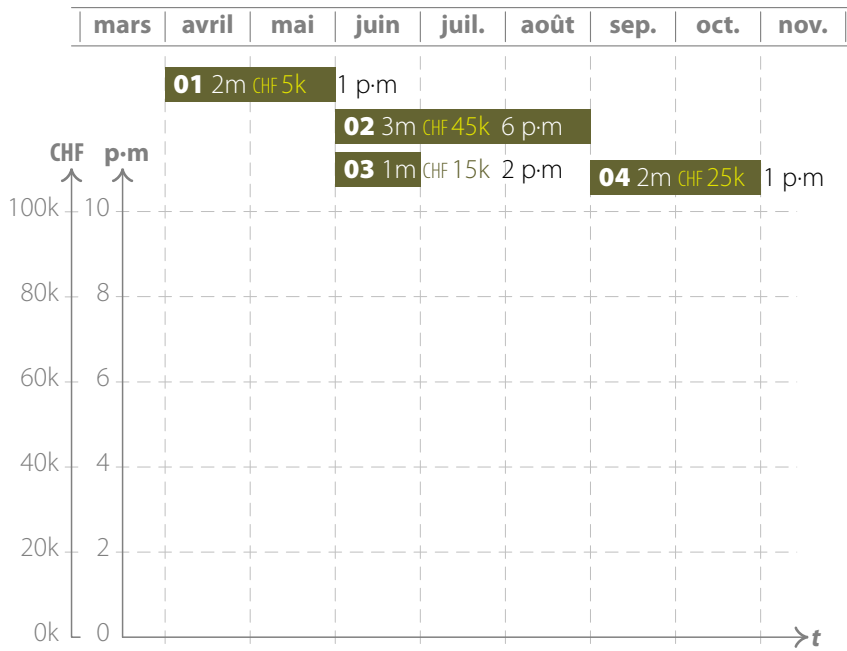
EVM Basics

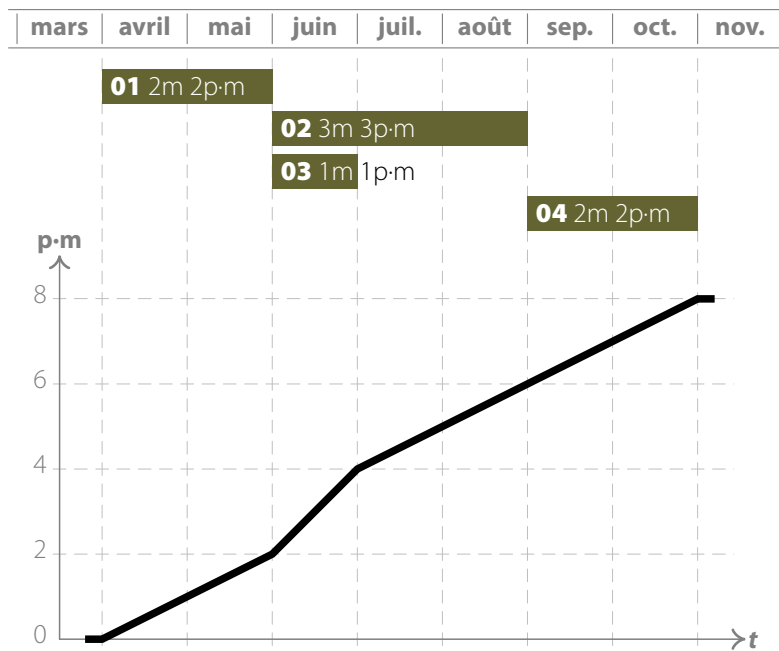


EVM Basics → TAB, Total Allocated Budget

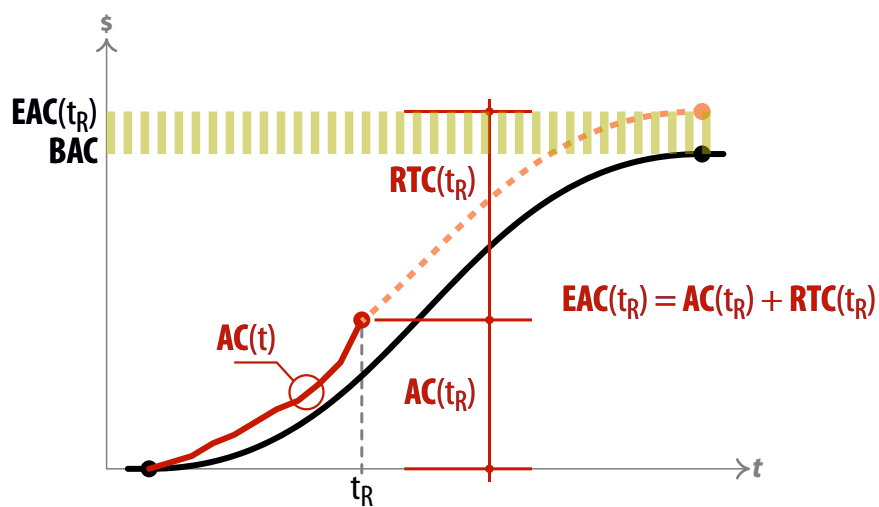




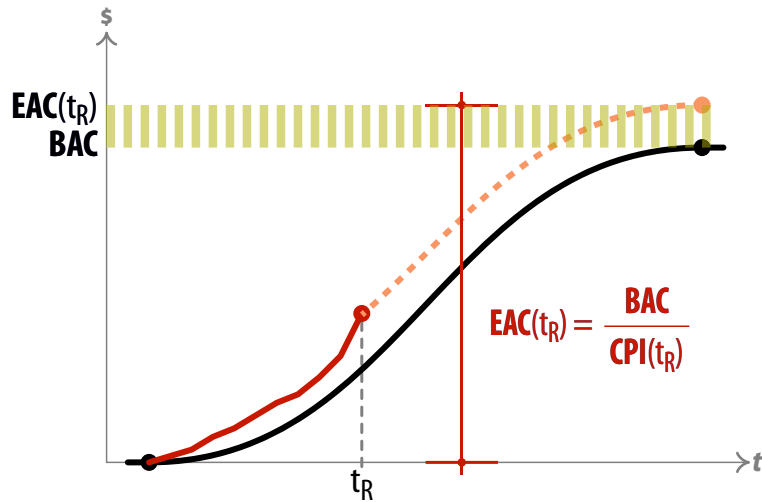




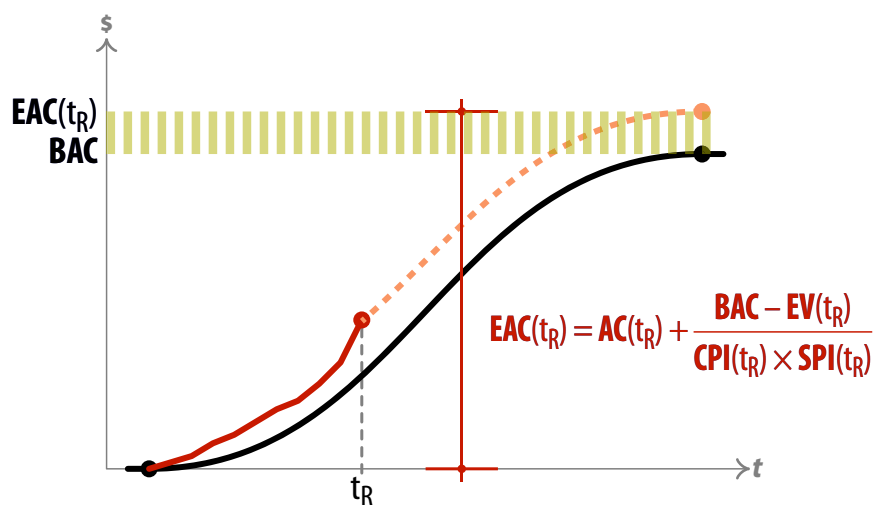
EVM → EAC, Estimation à l'achèvement,
Estimate At Completion.



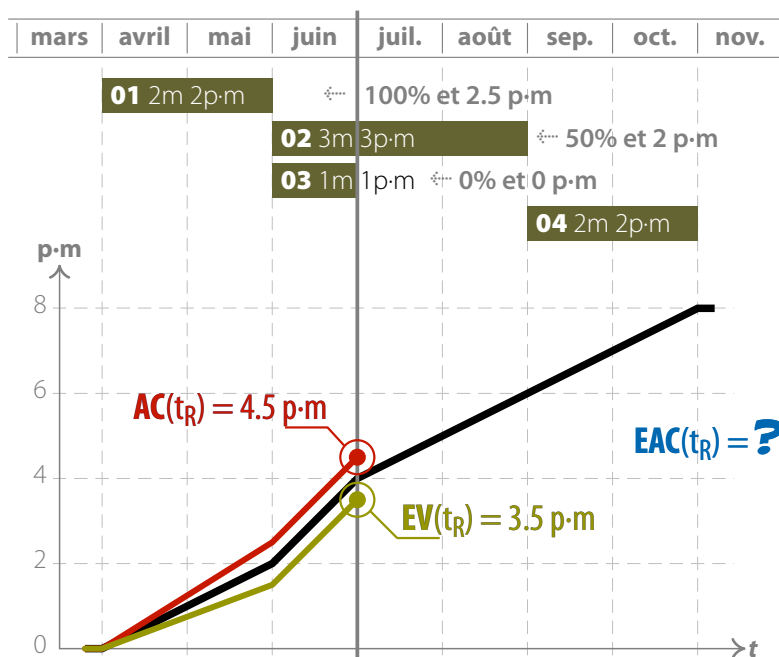
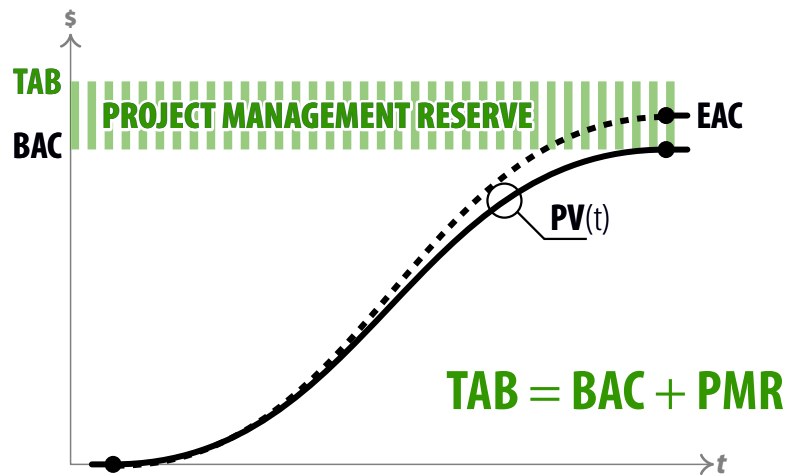
EVM → EAC, Estimation à l'achèvement,
Estimate At Completion.

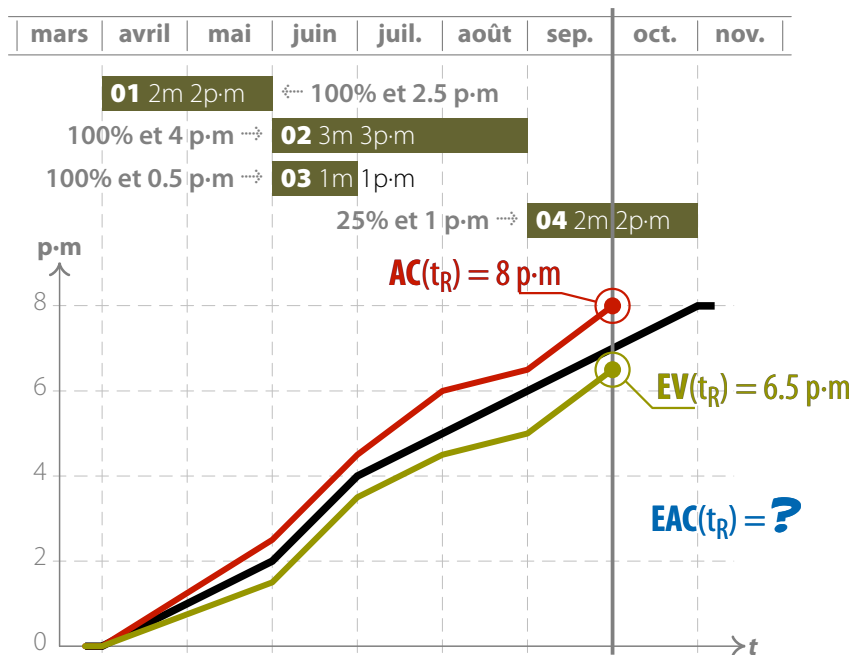


EVM → EAC, Estimation à l'achèvement,
Estimate At Completion.



EVM → TAB, Budget total alloué,
Total Allocated Budget.





32 Guidelines of ANSI/EIA-748-C

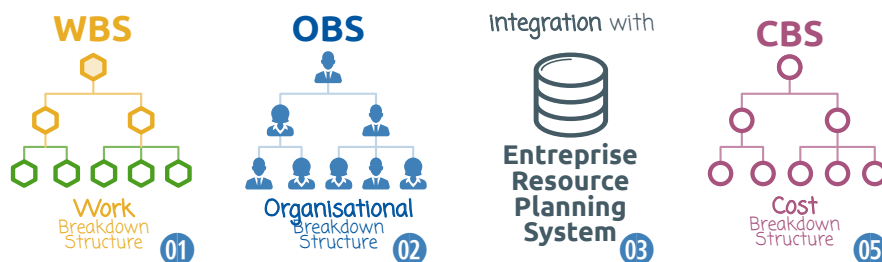
32 Guidelines of ANSI/EIA-748-C

Group 1 → Five **organization** criteria

INTERMEDIATE approach

Guideline #

- 01 Define the work scope → **WBS**
- 02 Define the project organization → **OBS** (and RACI matrix)
- 03 Integrate the project control processes to those of the organization
- 04 Organize overhead management → **indirect costs**
- 05 Integrate (i.e. matrix) the WBS and OBS → **control accounts (CBS)**



INTERMEDIATE approach


approach

- 

INTERMEDIATE approach

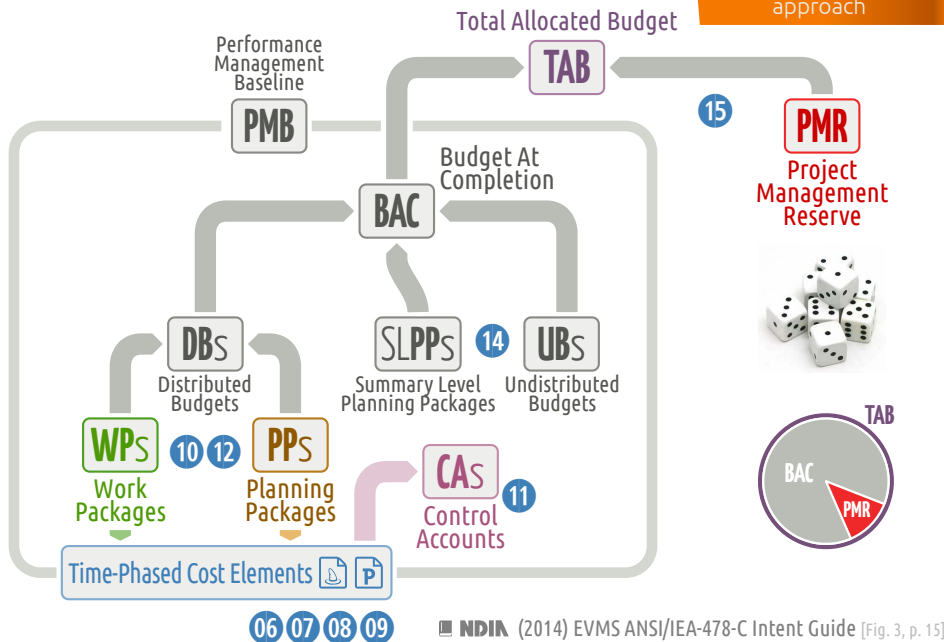
- ## Level-of-Effort task



-  LoE tasks distort overall performance measurement

Budget Element Hierarchy

INTERMEDIATE approach

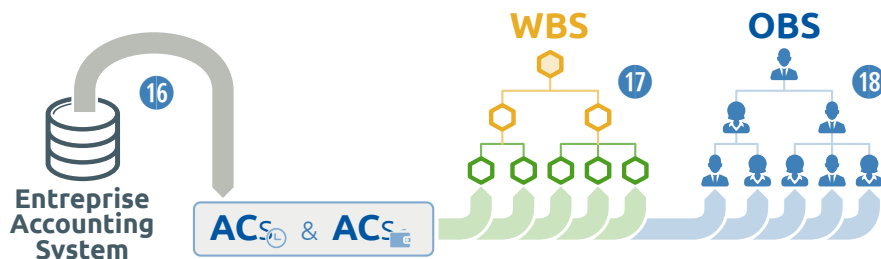


32 Guidelines of ANSI/EIA-748-C

Group 3 → Accounting consideration criteria

INTERMEDIATE approach

- 16 Record **direct costs** from the accounting system → ACs
- 17 Summarize direct costs by **WBS** element
- 18 Summarize direct costs by **OBS** element
- 19 Record/allocate indirect costs
- 20 Identify unit costs or lot costs
- 21 Track and report material costs and **quantities** → EVs

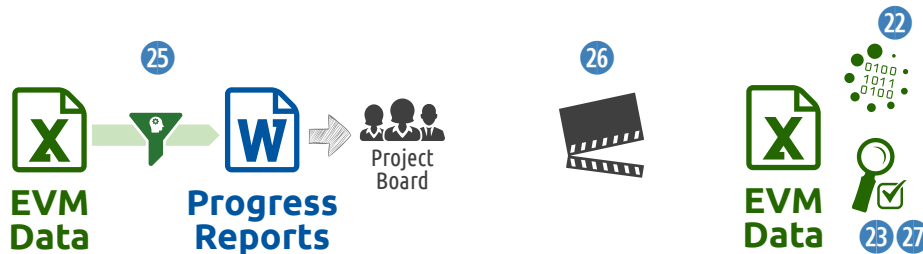


32 Guidelines of ANSI/EIA-748-C

Group 4 → Analysis and management reports criteria

INTERMEDIATE approach

- 22 Calculate (at least monthly) EVM **indicators** → **SV, CV, SPI, CPI, EAC**, etc.
- 23 Explain **significant variances**
- 24 Identify and explain indirect cost variances
- 25 Summarize EVM information for the **project board**
- 26 Implement **managerial actions** as result of guideline 26
- 27 Revise **estimates at completion** → **EACs**

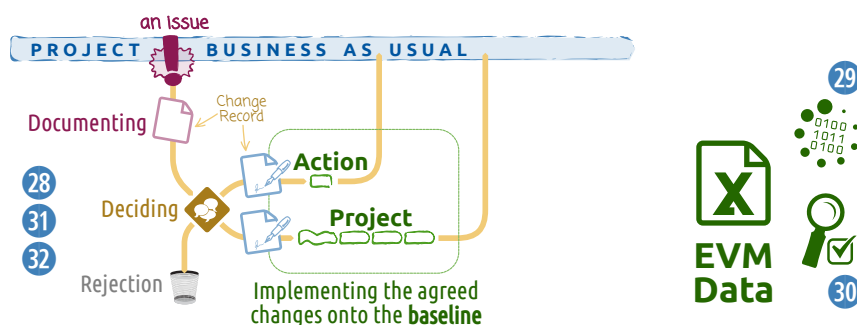


32 Guidelines of ANSI/EIA-748-C

Group 5 → Revision and data maintenance criteria

INTERMEDIATE approach

- 28 Incorporate **changes** in a timely manner
- 29 Reconcile current budgets with prior budgets
- 30 Control retroactive adjustments (commercial and economical fluctuations)
- 31 Prevent all but authorized budget changes
- 32 Document changes to the performance measurement baseline

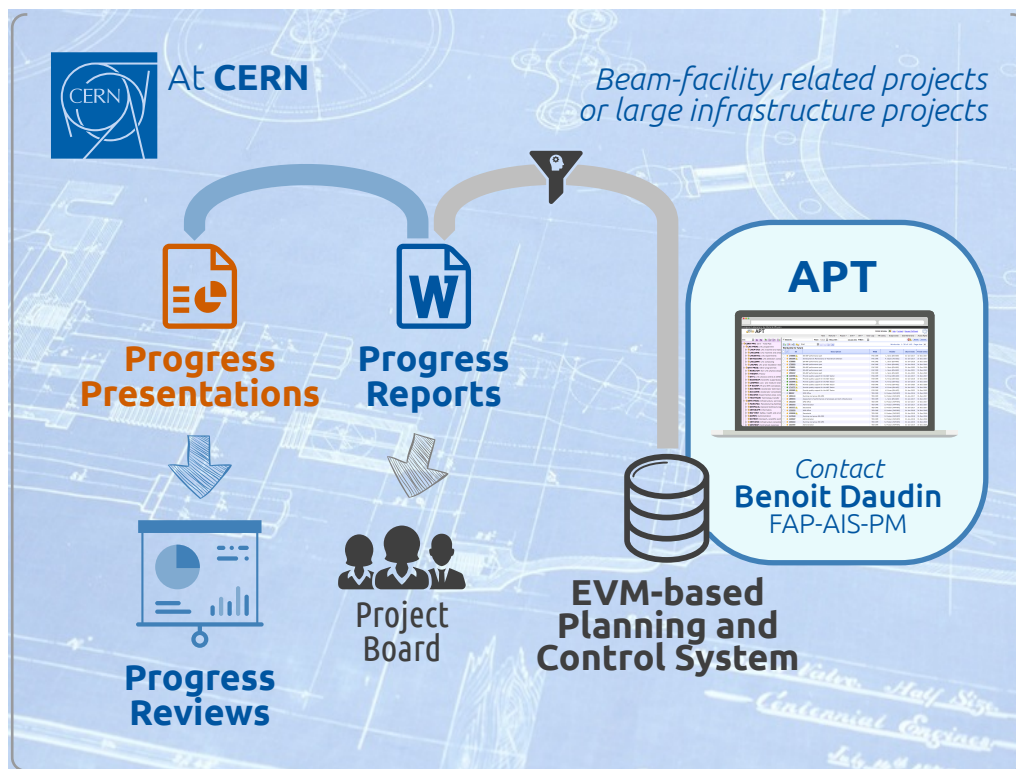
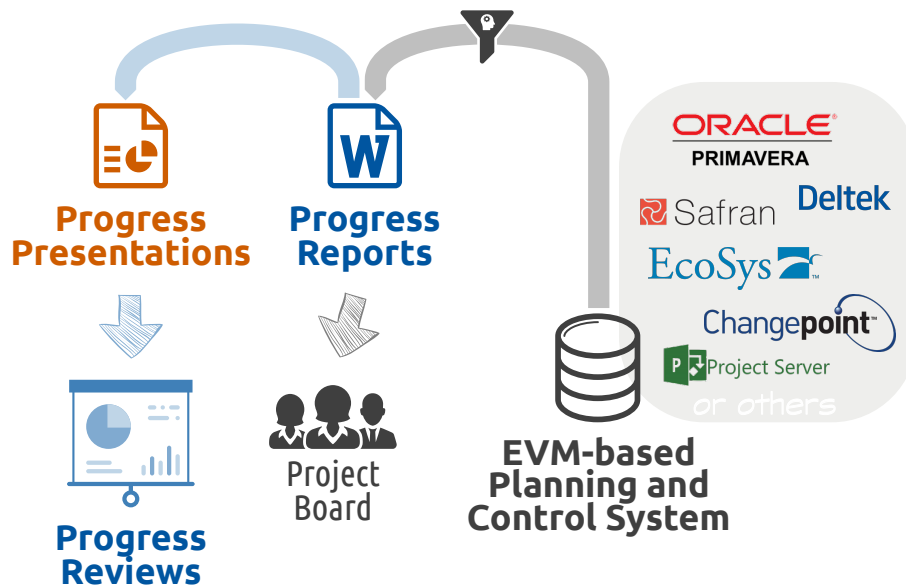


The 'advanced toolbox'

Project Control and Follow-up

The 'advanced toolbox'

ADVANCED
approach



Project Control and Follow-up

The 'advanced features'

ADVANCED
approach

- ➔ **Deliverable**-oriented earned value management approach
- ➔ Dealing with **price escalation, inflation**, the **economical context**
- ➔ Augmenting earned value with **earned schedule**
- ➔ **Buffer**-based schedule progress monitoring
- ➔ Using stochastic models, vector machines, machine learning, etc. to derive **more accurate estimates at completion**