Status of CAD data lifecycle and synchronization

(decisions, organization, example EN-MME design office)

Diego Perini on behalf of the many* who have contributed
to the preparation proposal and approval of this project

* Stéphane Bally, Alessandro Bertarelli, Francesco Bertinelli, Jurgen De Jonghe, John Evans, Per-Olof Friman, Yvon Muttoni, Antti Onnela, Marc Timmins, CAEC working groups.

Why synchronization and data consolidation?

✓ <u>The situation today:</u>
Two PLM systems not communicating. Since 2012 we know that we have to synchronize them if we want to minimize troubles in case of a migration.
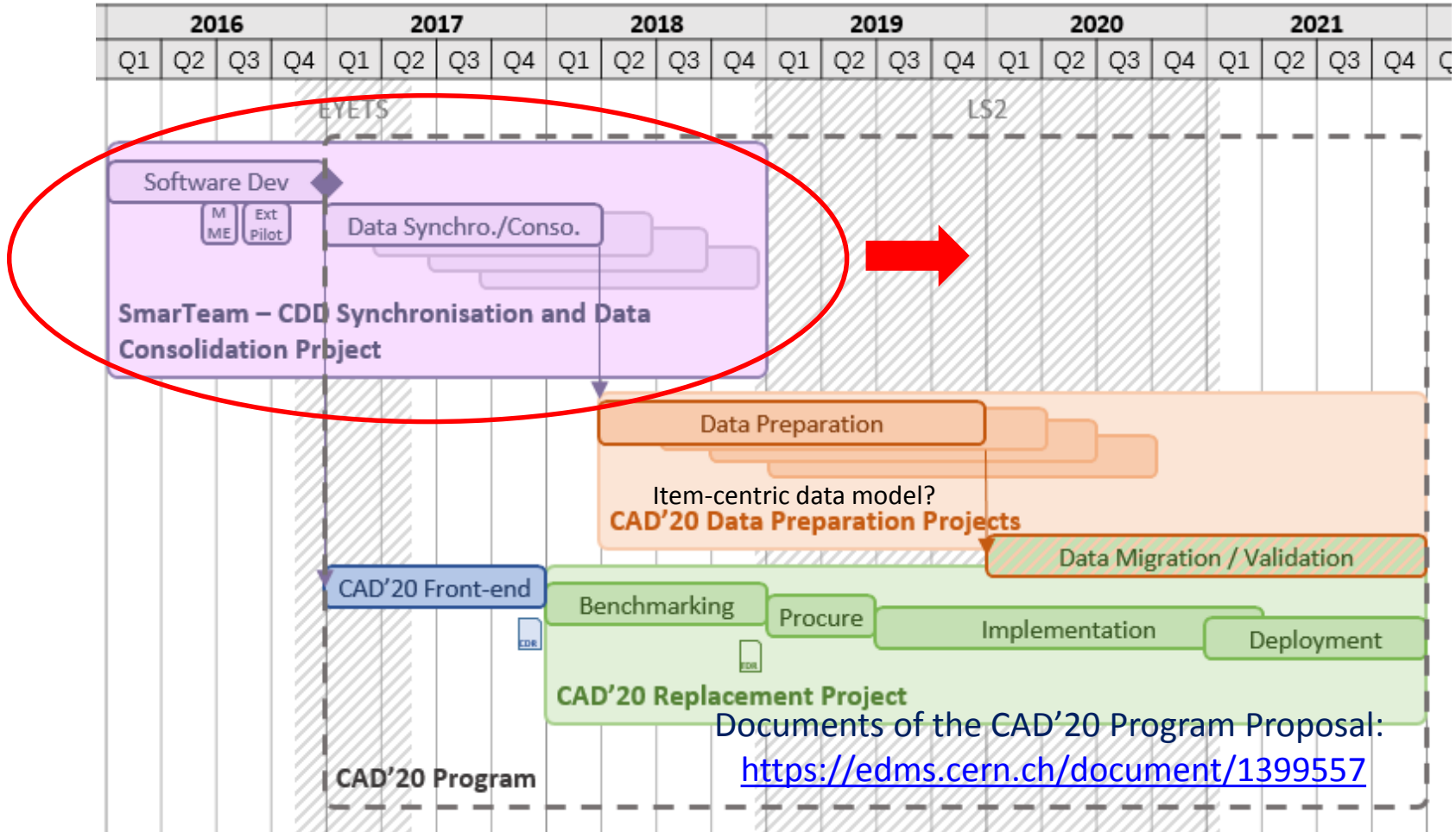
✓ <u>Which is the goal:</u>
long-term traceable CAD data (3D & 2D).

✓ <u>Resources needed:</u>
It will not be a transparent process. How do we minimize the impact on users of design offices.

✓ <u>And if someone does not do anything?</u>
Invest today to save in the medium and long term.

The CAD20 proposal went through different phases (presentations, re-scoping and re-scaling) and is not approved at the moment, but:

Meeting of the CERN Enlarged Directorate, 18 April 2017

Forthcoming changes in CERN CAD data management

Antti Onnela, EP-DT, chairman of CERN Computer-Aided Engineering Committee (CAEC)*,

on behalf of CERN CAD support and CAEC working-groups PLM-WG and GUCS,
in particular Stéphane Bally, EP-CMX, Jurgen De Jonghe, EN-ACE, Per-Olof Friman, EN-ACE,
Diego Perini, EN-MME and Marc Timmins, EN-MME

* CAEC https://caec.web.cern.ch/
- Steers the activities concerning tools and support for computer aided mechanical engineering and related fields at CERN. To this aim it requests and controls the budget covering the purchase and maintenance of standardized software.
- CAEC budget is managed in IT department and was 712 kCHF in 2016:
560 kCHF software maintenance, 120 kCHF software investments and 32 kCHF consulting.

CAD data management at CERN

CATIA V5 is CERN's official CAD system for mechanical and infrastructure design. **Smarteam** software is used for managing the CATIA CAD data.

Two major tasks need to be launched and accomplished on CERN's CAD data management:

Task 1: CAD Data Consolidation

- Allow approval and safe storage/distribution of 3D data
- Consolidate 2D and 3D data currently stored in different systems.

Task 2: Replacement of Smarteam

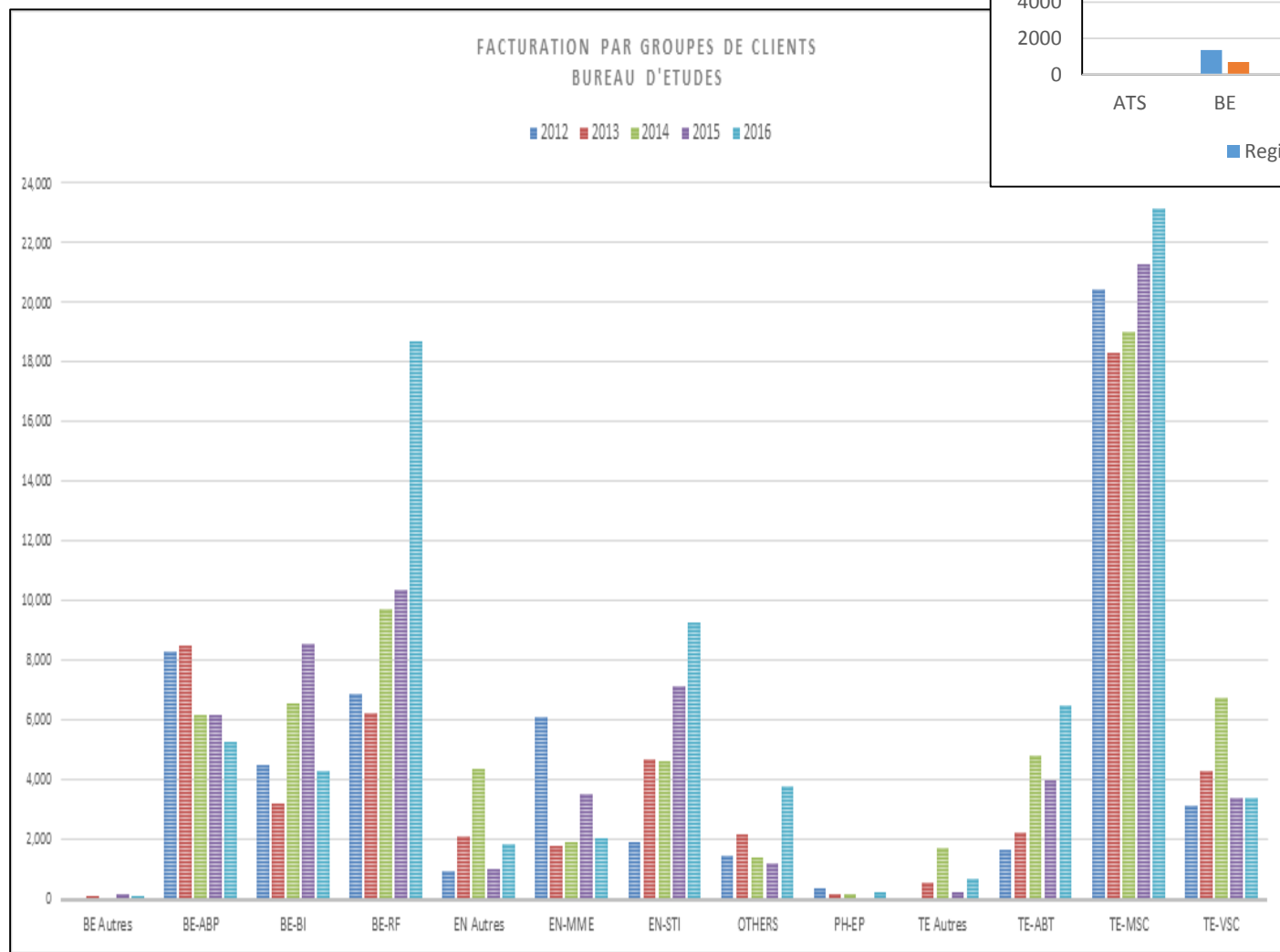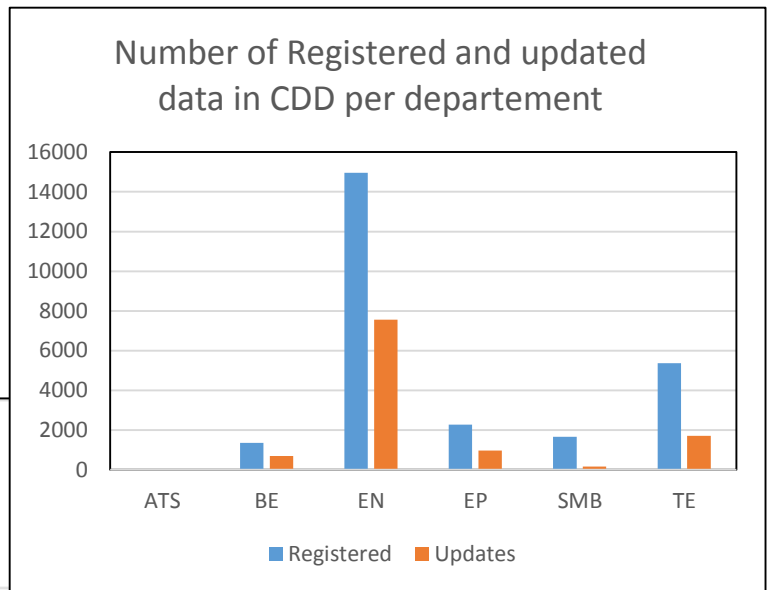Dassault Systèmes has announced to stop supporting Smarteam in 2020.

Compatibility with present and future CAD codes !

Consequences of such change

The resource impact from the new process, in particular where old data used:

- Estimate: During three first years ~5% of designers' time.
  - ~200 users x ~5% = ~10 FTE / year
- Impact highest in the beginning, expected to shrink with learning and more data having passed through the consolidation process.
- The impact is CERN-wide, distributed over all design offices and projects using CATIA-Smarteam
  - ➢ Biggest impact in EN-MME with its main design office.
    MME has requested from EN two additional designers to consolidate the CERN standard CAD part catalogues, and fix problems with existing models.
  - ➢ *How to support all other design offices (BE, EP, TE, SMB)?*
    Additional temporary resource (one person?) in the CAD support team (EN-ACE) to respond quickly to problems from the design offices.
    This resource has not been requested yet and is not clear how to obtain it.

Design office EN-MME, 55 full time designers.
Mechanical design, main users in BE, AT and EN.
Registration of new drawings in CDD: ~12000 in MME,
(14000 in EN –> 60% of the CERN total).

Number of Registered and updated data in CDD per departement

FACTURATION PAR GROUPES DE CLIENTS
BUREAU D'ETUDES

2012 2013 2014 2015 2016

➢ Pilot projects on the new CAD data process: on-going since autumn 2016

➢ Consolidate CATIA standard part libraries: before summer 2017 – on-going in EN-MME.

> Are there other repositories? What to do for them?
> Why not a single centralized one?

➢ Start using the new process in new design projects/jobs: June 2017

➢ All projects/jobs: October 2017

EN-MME design office – <u>Jobs are invoiced to the projects</u>

➢ The cleaning of our legacy has an impact on our activities. We are working with EN-ACE to keep the effect on users as low as possible.

➢ We can count on a budget of 200'000 CHF per year for this year and the next two (pending approval of FC in June).

➢ This money will be used to pay the extra hours.

   ➢ Example 1: Job of 100 hours, in old configuration -> 100 hours invoiced to the project BC.
   ➢ Example 2: same job in the new configuration -> 100 hours invoiced to the project BC, 5 cleaning hours paid with the special budget.

➢ We will apply a very controlled and transparent account of the cleaning hours.