COExperience

EXPERTS TOGETHER

APR 10-13, 2022

New Orleans, LA | Sheraton New Orleans Hotel

COMMUNITY OF EXPERTS
OF DASSAULT SYSTÈMES SOLUTIONS

Founding Partner
DASSAULT SYSTEMES

Success Factors for Migrating to 3DExperience

Windchill to 3DX in Aerospace Manufacturing

Philip Michaud Sales Executive
PROSTEP Inc.
philip.michaud@PROSTEP.com

Agenda

- Migration Roadmap and Planning
- Migration Strategies
- Execution and Considerations
- How to get it done correctly

Migration Roadmap and Planning

- Business drive the migration
  - Organizational Change Management is vital for any PLM Introduction and Migration.
  - Bring stakeholders in early and teach them what they will benefit from using the system.
  - Ensure executive sponsorship and have executive involvement from the start

- Think of migration requirements
  - What do you need to use the new system
  - What is required to decommission the old system.
  - Utilize or develop an archiving and other alternative strategies.

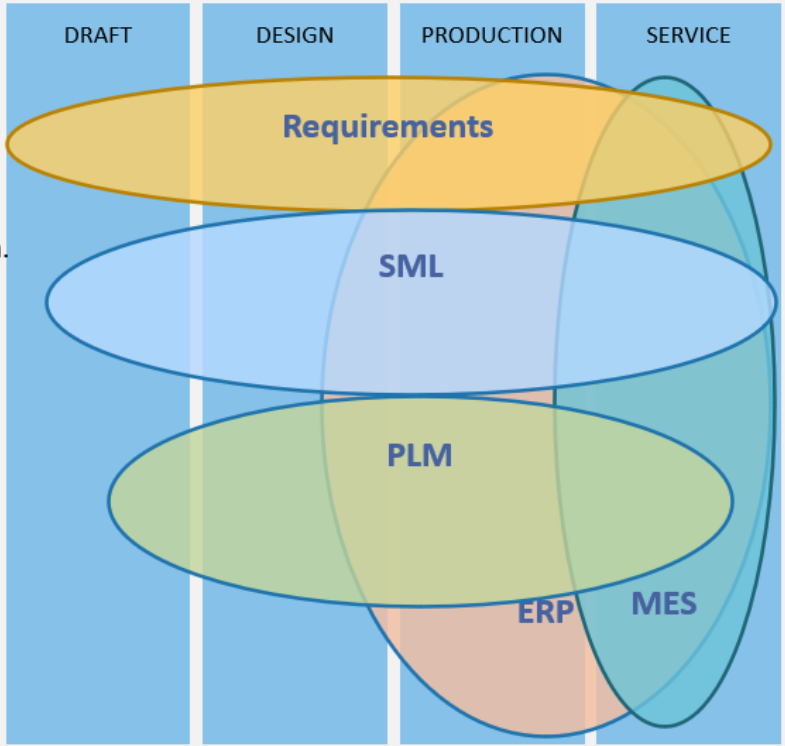
- Find a migration process strategy (roadmap)
  - Big bang versus incremental
  - Alignment with your business needs.
  - Don’t let the technology – let your business drive the adoption.

Business Drives Migration

- Data migration is a business issue with a technical solution
  - Data migration occurs because of an IT Project
  - IT projects exists to answer a business need
  - Business understands the meaning and relative value of its data
  - This knowledge defines cleansing, preparation, extraction, transform and load definitions
- Business knows requirements
  - Business has been running the legacy system and the legacy system was running the business
  - Business has the expertise to make judgements about the quality of data items
- Business is the key participant in the migration!
  - Subject Matter Experts need to drive the expected results
  - Agreement across the organization is paramount
  - Organizational Change management needs to be an intracal part of the solution

Understand your Data Maturity

- **REQ:** Process of defining, documenting and maintaining customer needs
  - 'As-expected" details
- **SML**: Model Based System Engineering
  - Initial Concept Designs, Structure, Behavior, Parametric
  - 'As-Idealized" details (iBOM) *"Phil's coined term"*
- **PLM**: Primary system for maintaining all engineering product data.
  - Handles Engineering Change, Release, Part(s), BOM(s), Classification, Requirements, Collaboration
  - "as-engineered" details (eBOM)
- **ERP**: Resource planning for manufacturing, managing manufacturing process, materials, supply chain, inventory, accounting, logistics.
  - "as-planned" details (pBOM)
- **MES:** Computerized systems used in manufacturing, to track and document the transformation of raw materials to finished goods
  - RFID, product details from the production floor
  - "as manufactured" details (mBOM)



Migration Requirements

Differentiate the requirements for decommissioning your legacy PLM from the requirements for introducing the new PLM

For Legacy PLM

- What is the required data that needs to be extracted?
- What version / iteration requirements? All history? Just released?
- How to handle “other” system data like tasks, workflow history, etc. that may not map to new PLM?

For New PLM

- Define what is needed to be operational in your new PLM system?
- Is all the CAD history required or maybe just the top 20 programs CAD data?
- Do you have an alternative archiving strategy for unused legacy data?

PLM Migration Roadmap

AS-IS ANALYSIS

PLM Architecture
PLM Information Flow and Capabilities
Challenges and Discontinuities
Compare to Market
Statistics (Data, Performance, Usage)

TO-BE DEFINITION

Business Strategy Definition / Future Topics
Major PLM Concepts
Business Processes Realignment
Reference Customers and Best Practices
Vendor Presentations
Business & IT Requirements Spec
Migration Strategy Selection

SYSTEM SELECTION

Pilot / Proof of Concept
RFP
Assessment
Contracting
HW/SW Procurement
Implementation Specification
Migration Project Planning

IMPLEMENTATION

IT Project Management
Bulk Migration and Conversion Implementation
Data Reporting, Cleanup, and Alignment
Co-existence Synchronization Implementation
Business Processes Implementation
System Interfaces Implementation
Validation & Verification

GO-LIVE PREPARATION

UAT
End User Training
Admin Training
Migration Dry-runs / Rehearsals
Synchronization Testing
Rollout Scheduling

GO-LIVE

Rollout
Delta Migration
Ongoing Synchronization
On-site End User Support

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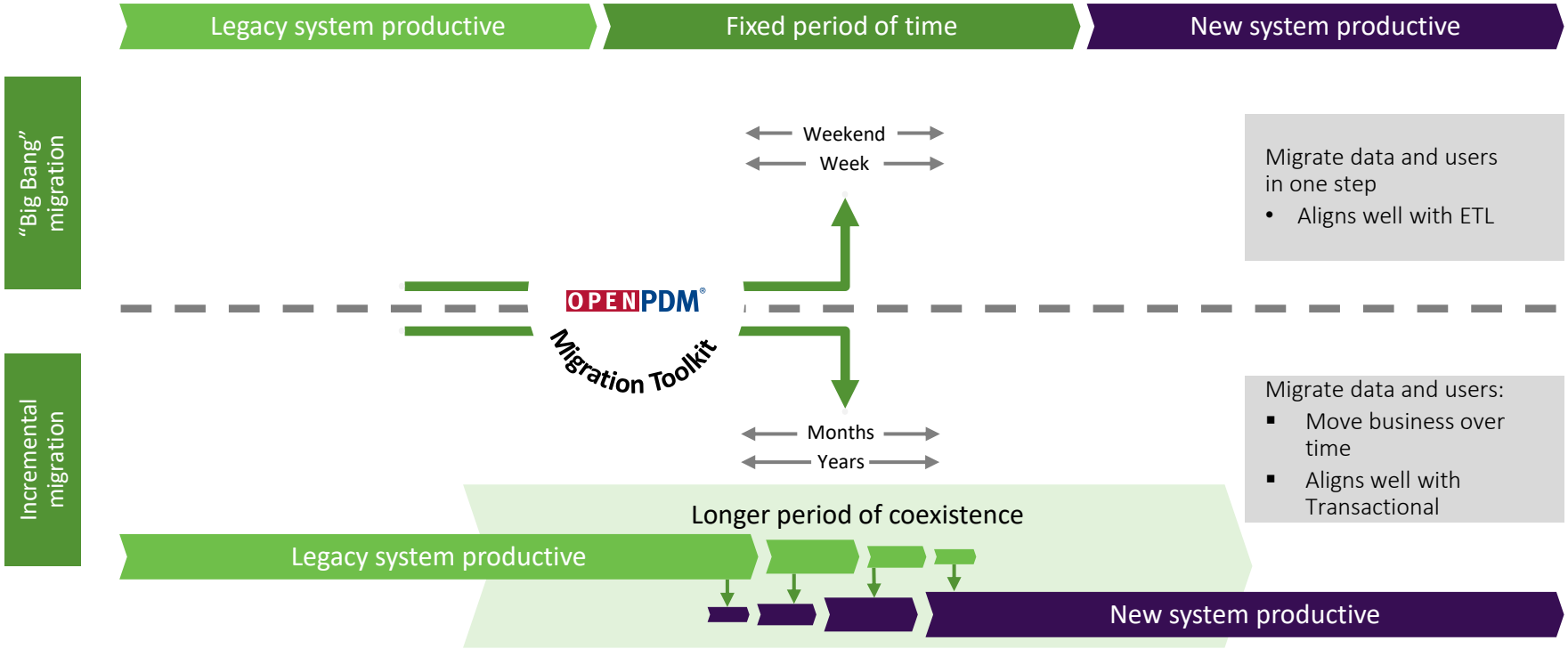
Migration Strategy

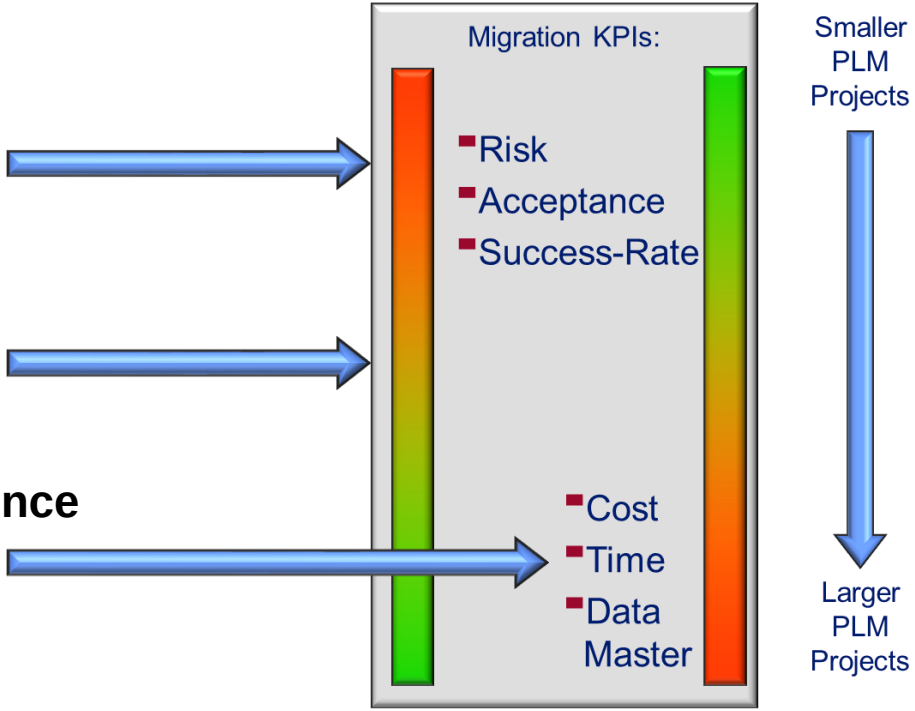


ETL vs. Transactional

- ETL Benefits
  - Ability to modify data and correct issues in the staging database
  - Good performance for large volume of data
  - Lends itself to good repeatable testing scenarios
  - High quality results for a one-time first go-live of new PLM
- ETL Risks
  - Staging database gets out of sync quickly
  - Intermediate database means export / import is done twice
  - Modification of data does not always sync up to legacy PLM or 3rd party integrations
- Transactional Benefits
  - Enables staged migration of data
  - Staged migration allows for easier PLM adoption strategies
  - Errors are more easily controlled and corrected
  - Enables migration to move at the pace of business
- Transactional Risks
  - Garbage in, Garbage out
  - Order of import operations is not always transparent
  - Performance is not as good
  - Testing can be cumbersome

Strategy Recommendations

- **One Time Migration**
  - Exact preparation
  - Long test phase
  - Emergency plan to go back
  - Unidirectional
- **Staged Migration**
  - Process oriented
  - Focus on semantic group of data
  - Controlled Replication
- **Incremental Migration, Coexistence**
  - Transfer of small data packages
  - Controllable in going step by step
  - Bidirectional



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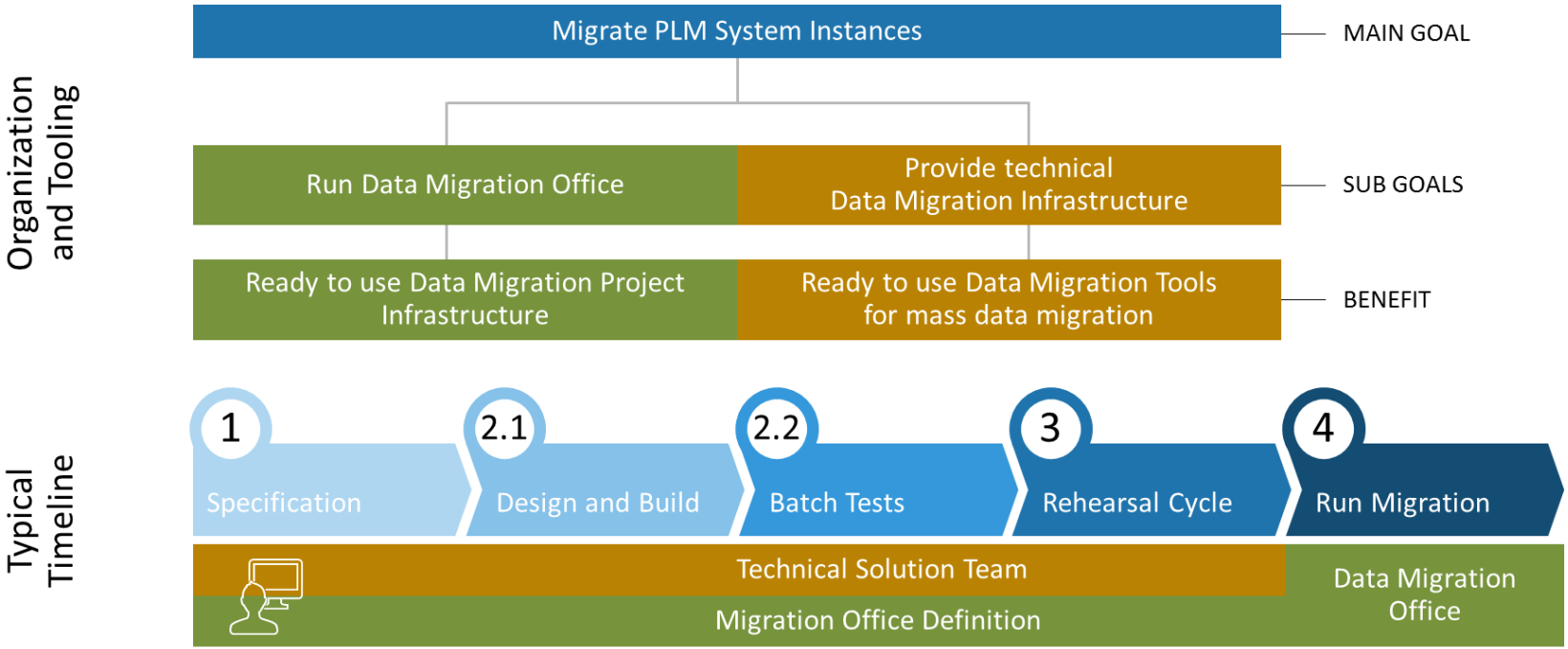
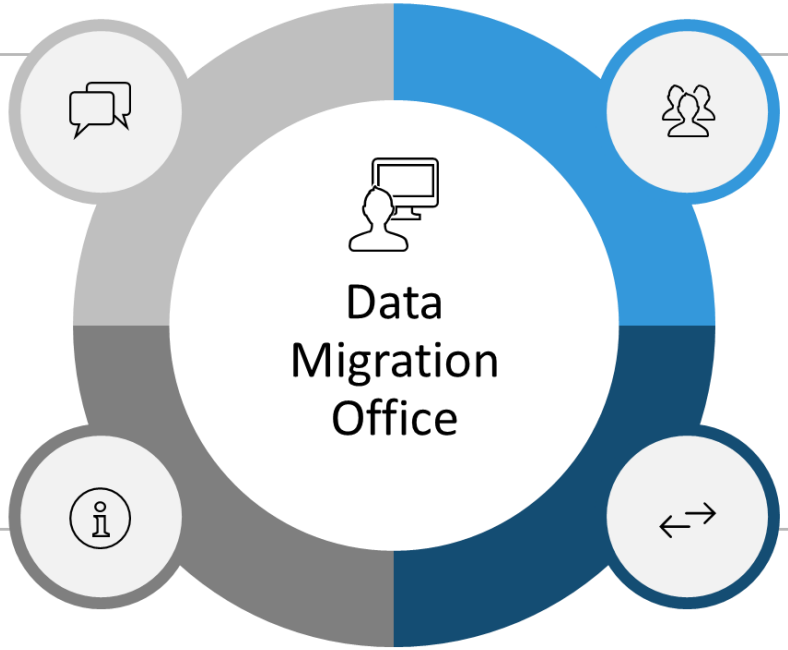
Technical and Execution



Migration Office Team



REPORTING AND COMMUNICATION

Reporting to all Stakeholders
Who needs to know what?

MIGRATION PROCESS

Definition of the migration process including templates

KPI AND INFORMATION

Track execution performance & issues

EXECUTION AND COORDINATION

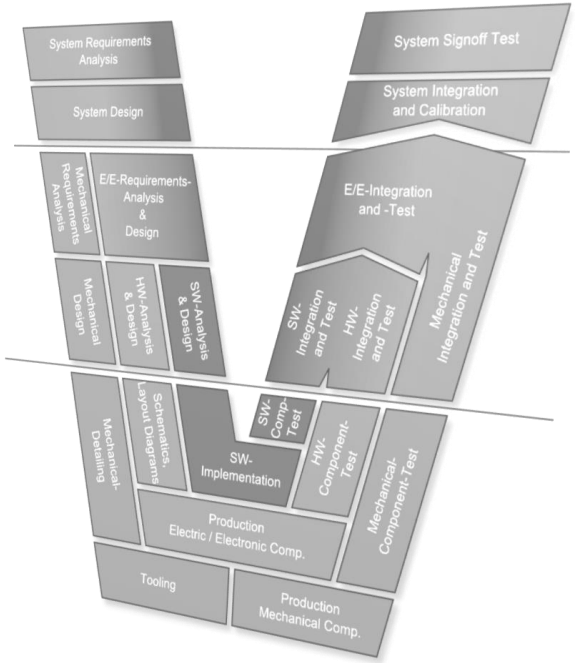
Coordinate migration process execution Run Migration

Technical Development Advise

- **For One Time Migrations -** Target complete migration development, testing and execution
  - Strategy and Requirements workshop resulting requirements and implementation plan
  - Implementation of migration use cases with basic system testing
  - Execute “Migration Rehearsals” that include:
  - Limited data (10%) to test requirements
  - Full data (100%) to test migration data success
  - Production Migration

- **For Incremental Migrations -** Target 3-5 migration use cases per development period and iterate in a standard software development pattern. Sprints should be between 2 to 4 weeks.
  - Strategy and Requirements Workshop for each sprint
  - Implementation of migration use cases with unit tests and system integration tests
  - Execute user acceptance for incremental functionality
  - Migration execution utilizing group that includes migration tool developers

- Utilize the same development and migration office team to build understanding and core competence.



PLM Introduction Planning

- If migration is to a newly introduced PLM be prepared for Parallel development
  - Remember that there is a strong dependency on the PLM introduction
  - Sometime this is a moving target during the development affecting data conditions, mapping and process
  - Bugs in the system result in bugs in the migration
  - Migration is incredibly performance intensive and new systems do not always perform well
  - Release schedules are inter-twined
  - New vendor systems are not always well understood by customers, they need to learn how to use it!
  - Any business case ROI from migration is in the new system

Migration Execution Phases

Preliminary Phase

- Announce the migration
- Communicate all tasks and timeline

Preparation Phase

- Prepare productive environment
- Communicate downtimes

Migration Phase

- Lock source system
- Execute data migration

Fallout

- Migration successfully finished
- Perform post-migration tasks

Fallback

- Perform rollback tasks
- Unlock source system

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PROSTEP Partnerships with Dassault Systemes

- Software and Services

SOFTWARE PARTNER V6 Partner DASSAULT SYSTEMES

CAA 3DX/V6 PARTNER
3DX/V6 COMMUNITY PARTNER

SOFTWARE PARTNER V6 Partner DASSAULT SYSTEMES

3DX ENOVIA PARTNER

SOFTWARE PARTNER V5 Adopter DASSAULT SYSTEMES

CAA V5 ADOPTER

SERVICES PROVIDER PARTNER DASSAULT SYSTEMES

DEVELOPMENT SERVICE PROVIDER

PROSTEP – 3DExperience Capabilities

Data access

OpenPDM 3DExperience Connector

- Support of full MCS Java interface
- Import and export the full set of 3DX objects like parts, requirements, documents, XCAD data, …
- Import and export of EBOM and XCAD document structures
- Import and export of data stored in all 3DExperience centrals (except VPM – see right)
- Fine granular object access down to single attributes

OpenPDM XPDM Connector

- Support of full 3DExperience XPDM interface
- 3DExperience XPDM Use Case driven
- Import and export of 3DExperience Product Structures to 3DExperience CATIA and DELMIA (VPM Central)
- Support of 3DExperience POWER'BY
- Support of 3DExperience CAD format converters

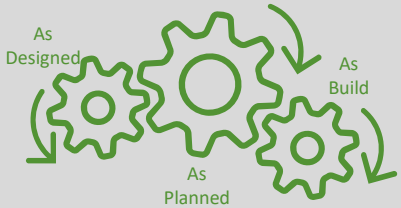
OPENPDM®

Integration Platform

OpenPDM Migrate Architecture

Windchill

- Due to the strategy program wise
- Objects in the right order to get consistency in the target system



OpenPDM Connector

Export

OPENPDM®

- Migration Process engine
- Business Logic
- Data Model Mapping
- Monitoring

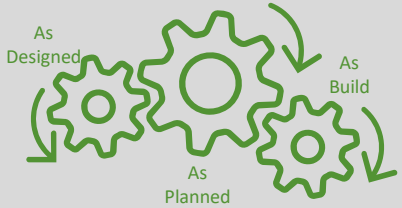
CAD Structure
Documents
Libraries
Standard Parts
Engineering standards

Import

OpenPDM Connector

3DExperience

- With regards to the business logic
- Objects in the right order to get consistency in the target system
- Quality checked
- Performance managed



3DExperience – Windchill Integration

Use cases and features of OpenPDM CONNECT 3DExperience – Windchill based on XPDM

Use Cases

- Transfer of existing component information from Windchill to 3DExperience to start the design
- Transfer of information created by the design from 3DExperience to Windchill to be used in Windchill downstream processes

Windchill –> 3DEXP

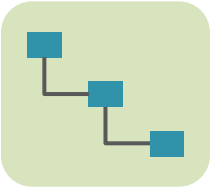
- Product Structure Information
  - complete
  - partial

3DEXP –> Windchill

- Product Structure Information
  - complete
  - partial
- CAD Neutral Formats for Viewing (CreoView)

Step 1: Creation of upper-level structure

Windchill

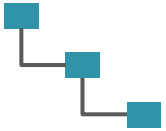


3DExperience

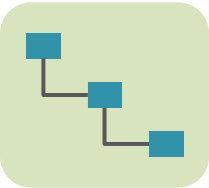
The upper-level structure for a new product is available in Windchill.

Step 2: Synchronization of product structure

Windchill



3DExperience



Synchronize

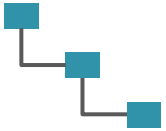
OpenPDM CONNECT is triggered e.g. by a workflow of Windchill to start the synchronization.

OpenPDM CONNECT exports the upper-level structure out of Windchill (structure and metadata).

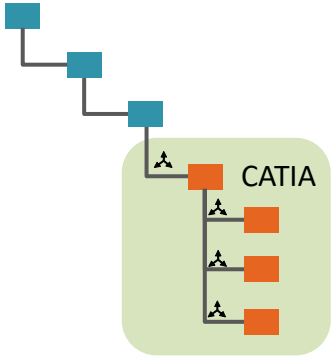
OpenPDM CONNECT performs the mapping to 3DExperience and creates the product structure in CATIA 3DX.

Step 3: Add CATIA design

Windchill



3DExperience



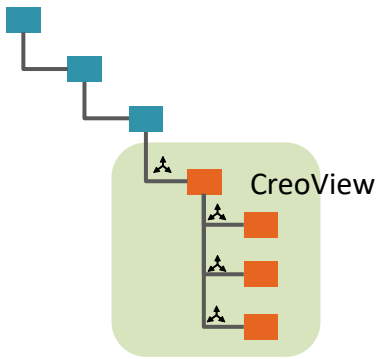
CATIA design is performed by designer in CATIA 3DX.

The designer adds the geometry to upper-level structure.

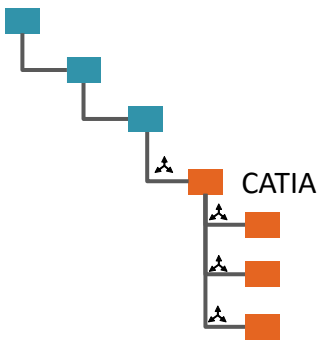
The design task is finished and can be published to the engineering structure in Windchill.

Step 4: Synchronization of product structure

Windchill



3DExperience



Review/Confirm

3DExperience – Windchill Interface

Needed Licenses

3DExperience

- Collaborative Sharing (PCS)
- Collaborative Innovation (CNV)
- Adapter for XPDM (MUX)

Windchill

- Windchill User License
- With rights to read and write the data

OpenPDM

- CONNECT package with
  - OpenPDM Base
  - OpenPDM Windchill Connector
  - OpenPDM XPDM Connector
- For PROD, QA, TEST Instance

3rd Party

- CAD Converter License (Theorem, …)
  - STEP/CV5 to CreoView
- Number of licenses must be defined based on CAD volume

Questions?

THANK YOU!

Philip Michaud

Sales Executive

PROSTEP Inc.

- PROSTEP Inc.
- 100 W Big Beaver, Suite 200
- Troy, MI 48084

- US Toll Free Company Voice: 8-PROSTEP-01 (877-678-3701)
- US Toll Free Company Fax: 8-PROSTEP-02 (877-678-3702)

- philip.michaud@PROSTEP.com