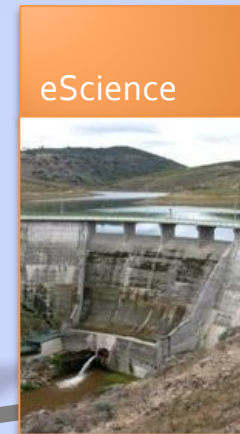
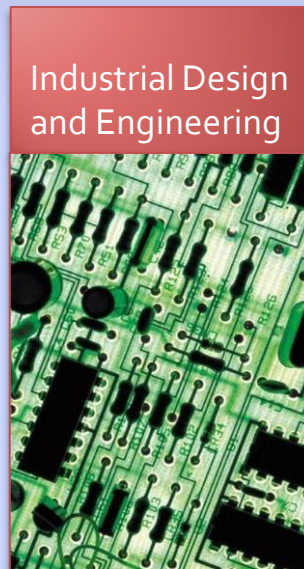
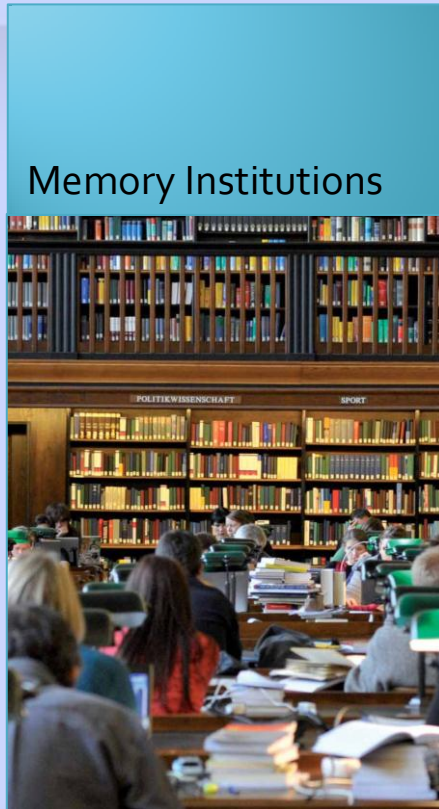


Long Term Preservation of Engineering Data in the SHAMAN Project

The industrial use case within the SHAMAN project (ISP-2)

- ❑ Synonym : Sustaining Heritage Access through Multivalent ArchiviNg
- ❑ EU funded FP7 Project; 4 years duration
- ❑ Project Volume 12.3 Mio €
- ❑ 16 Partner from academia, memory institutions and industry
- ❑ 3 Subprojects in memory institutions industry and science

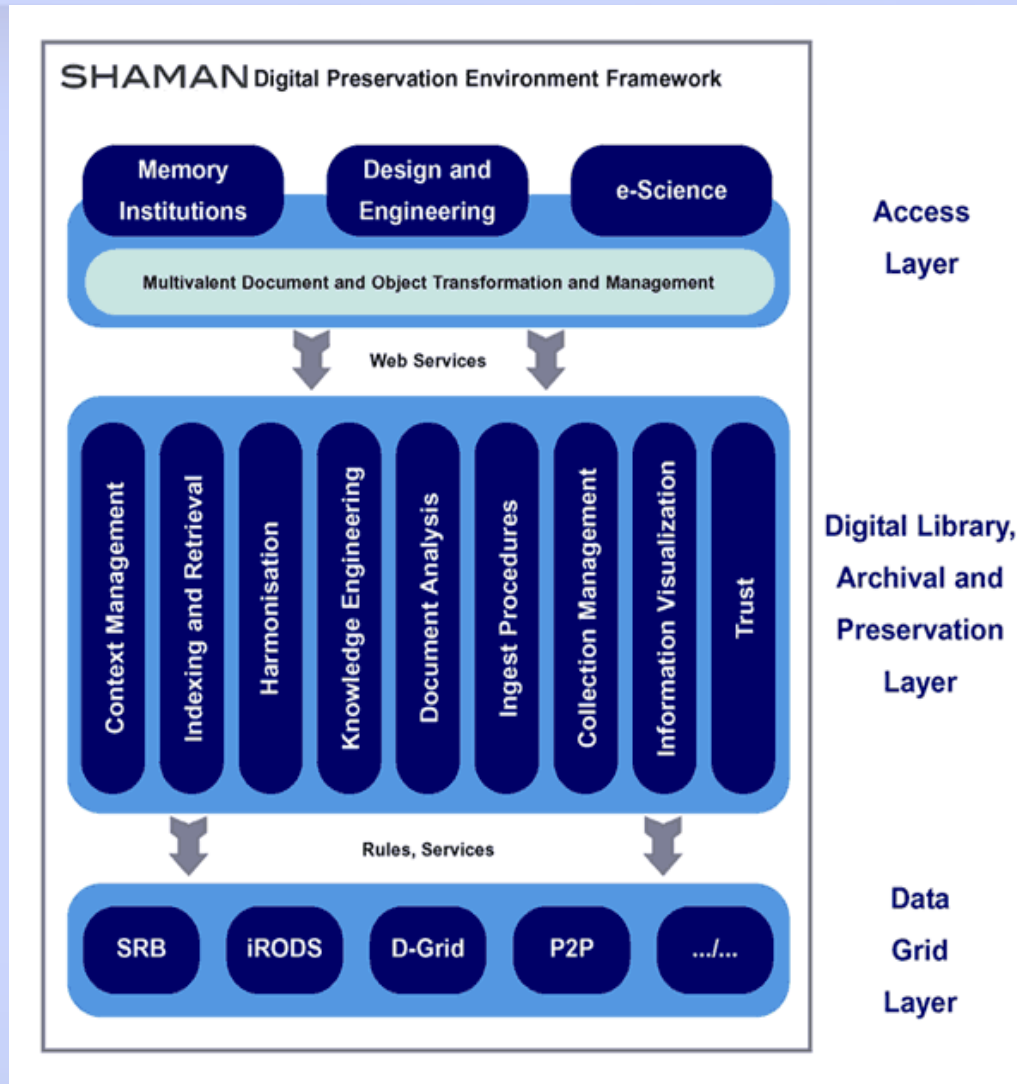




- ❑ ISP-1 – Document Production, Archival, Access and Reuse in the Context of Memory Institutions for Scientific and Governmental Collections
- ❑ ISP-2 – Simple and Connected Object Production, Archival and Reuse in the Industrial Design and Engineering Domain
- ❑ ISP-3 – e-Science Data-Acquisition and Harmonization Test Bed

SHAMAN Preservation Framework

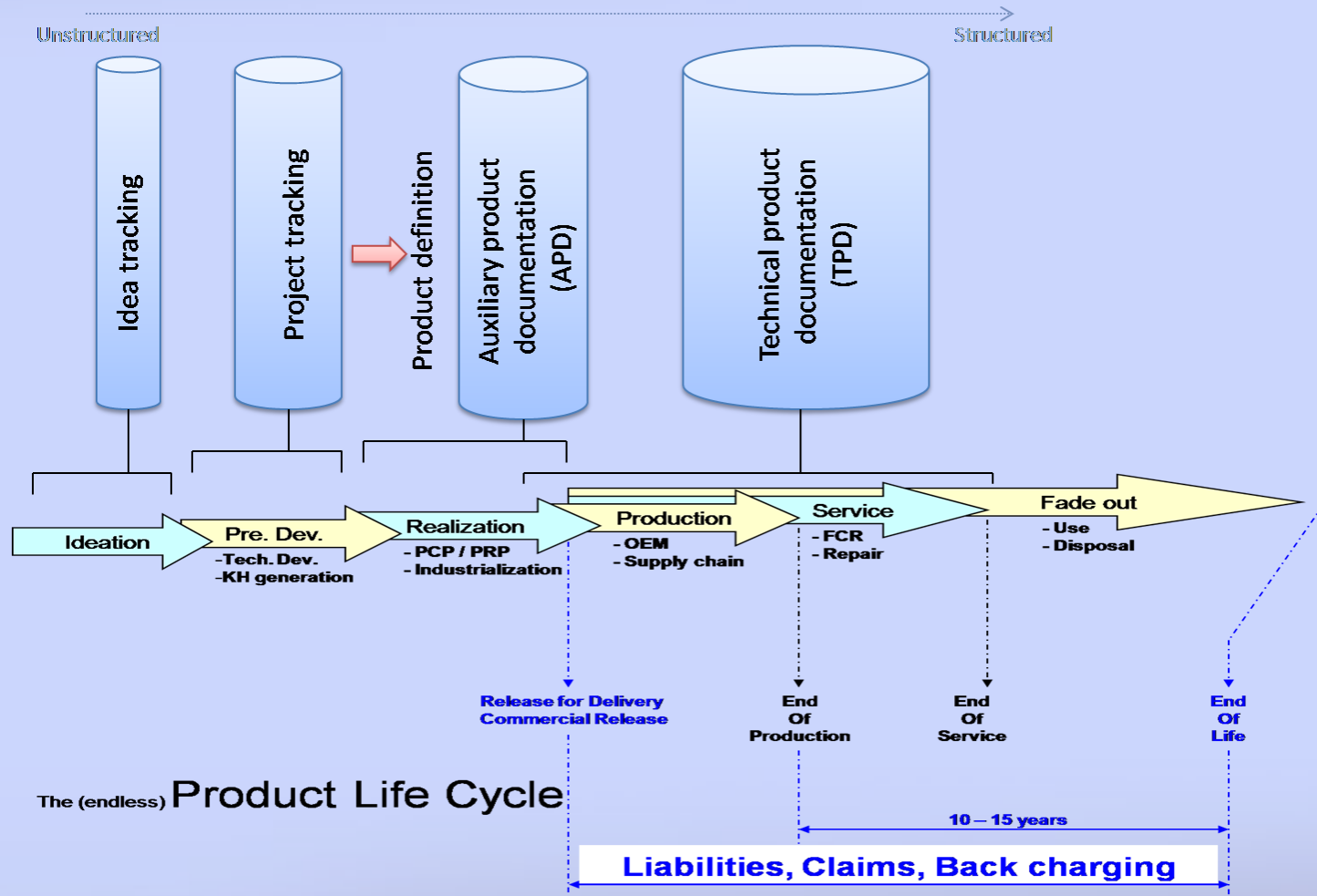
In|Con|Tec



- ❑ Presentation of Paul Watry of University Liverpool about “Multivalent Technology”
- ❑ Idea and following investigations if “Multivalent” would be useful for Engineering documents and artifacts
- ❑ Philips contribution with “Ideation” use case
- ❑ Allow to preserve ideas documented in multiple file formats from office documents and multimedia files up to 3D models

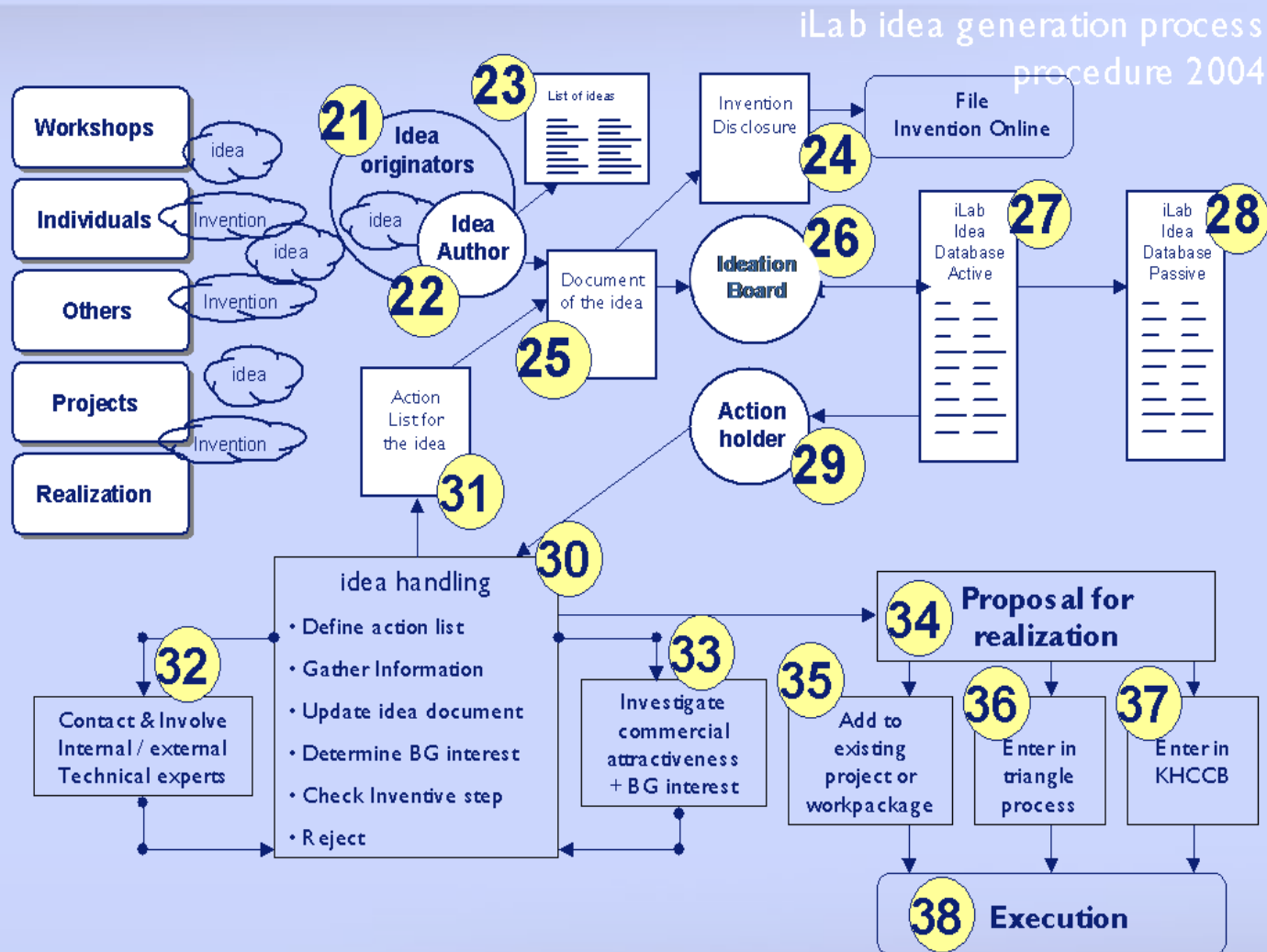
Ideation in the Product Life Cycle In|Con|Tec

Documentation processes at Philips

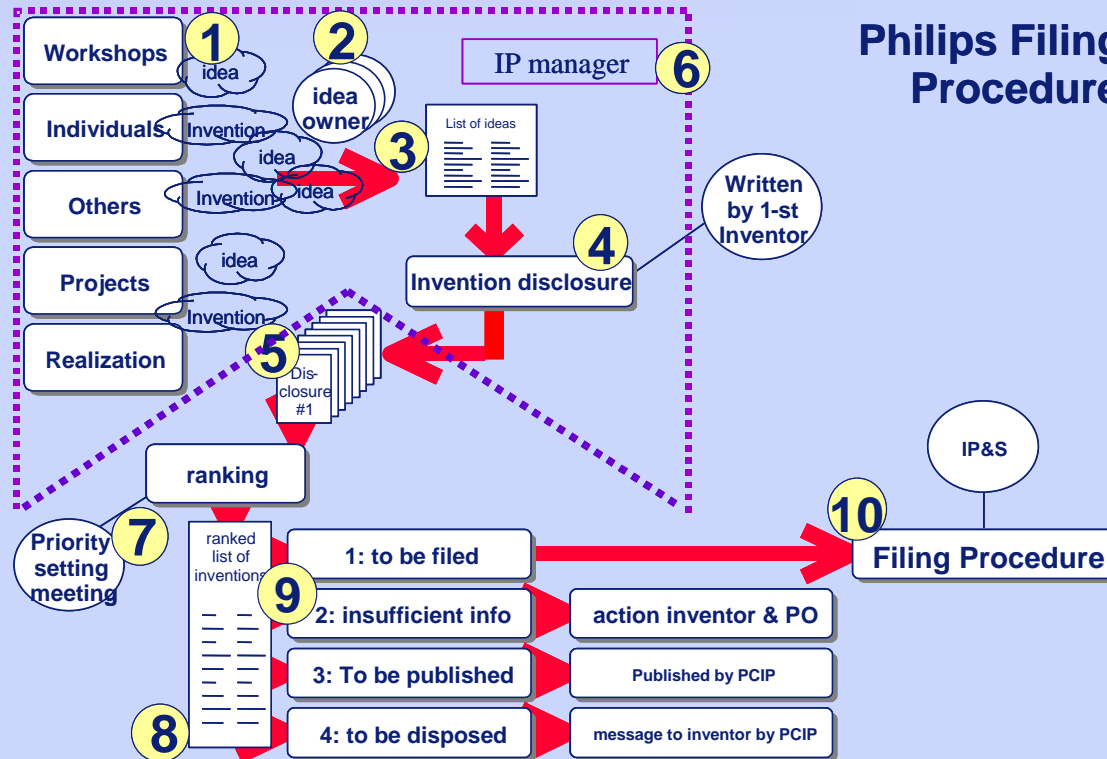


- ❑ Suggestion boxes are made accessible for everybody inside Philips electronically
- ❑ Ideas should not be limited by formalism like templates, file formats or other directions
- ❑ Ideas should have a description in the best fitting format or with an expressible tool the inventor can cope
 - Office formats
 - Multimedia formats
 - Graphical formats

The Ideation Process



iLab IP generation procedure



- ❑ Multiple formats
- ❑ Various life cycles depending on
 - Technology status
 - Market preparedness
- ❑ Changing terms and taxonomy
- ❑ Collaborative processes require traceability
- ❑ Access to established data bases
 - PLM data
 - Component data

- ❑ Various life cycle → Preservation needs
- ❑ Changing taxonomies → Ontologies
- ❑ PLM sources involved → PLM integration
- ❑ Common viewer required → Multivalent FAB₄
- ❑ Proven Archive → iRods
- ❑ Flexible Search mechanism → SOLR
- ❑ Standard for preservation → OAIS compliance
- ❑ Common framework → SHAMAN Framework

Large Scale Distributed Collection and Preservation Environments

Policies in Production, Assembly, Preservation, Access, and Reuse

Infrastructure Independence

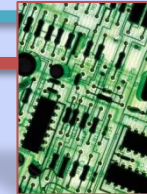
Context Representation, Capturing, Preservation and Re-use

Information Extraction, Access and Discovery Support

Risk Management and Mitigation Enforcement



Memory Institutions



Industrial Design and Engineering



eScience

Rare Standards and Thousands of Formats

In|Con|Tec

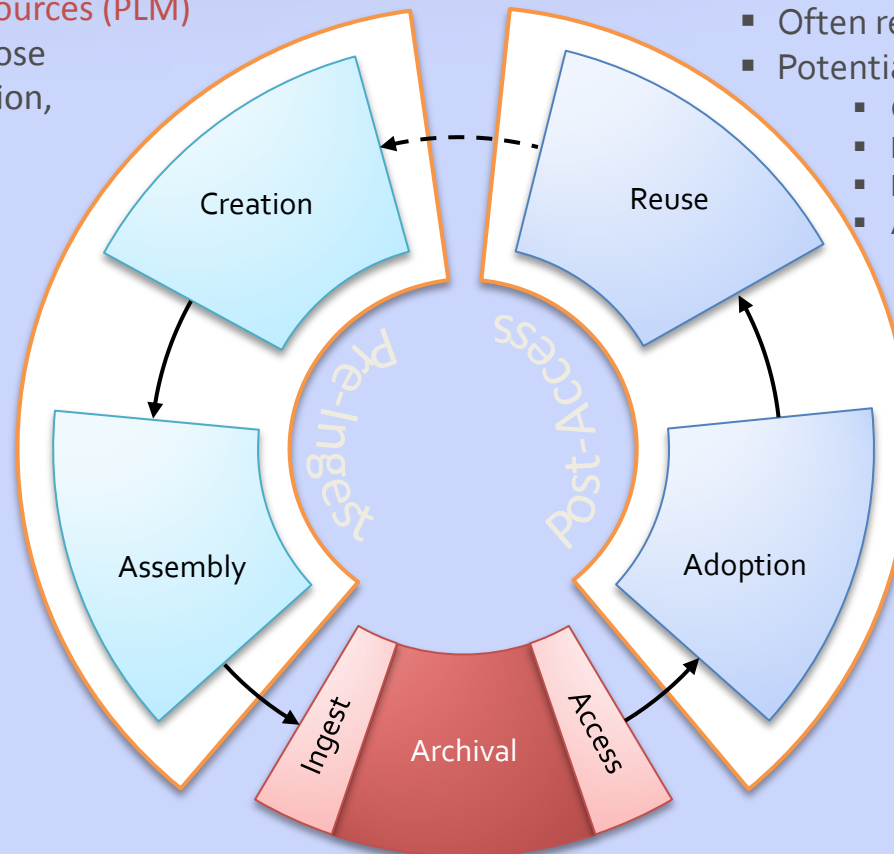


Format	Weakness	Strength
Adobe 3D (3D-PDF)	Unsure future, CAD vendor support unclear	ISO process started
U3D	No solid Modeling	Surfaces standardized maintained
STEP (LOTAR)	Heavy weight voluminous format, Not ideal for fast retrieval and visualization	Exact geometries, meets manufacturing requirements, supported by aerospace industries and STEP organizations
J-T	No parametric history	Light weight, multiple vendor support, assemblies supported, Standardization process had been started, license free, J-T open community

- ❑ Open standard developed by ... UG, Siemens PLM
- ❑ Industry standard for visualization, collaboration, data exchange, and long-term preservation of 3D product data
- ❑ Contains also the manufacturing information in contrast to other standard formats, which represent usually only a fraction of a product design or its manufacturing information.
- ❑ Since end of 2009 the JT format description is published as an ISO Publicly Available Specification (PAS).

- Production of new digital objects
- Acquisition from established sources (PLM)
- Use according to original purpose
- Archival often right after creation, in parallel to use

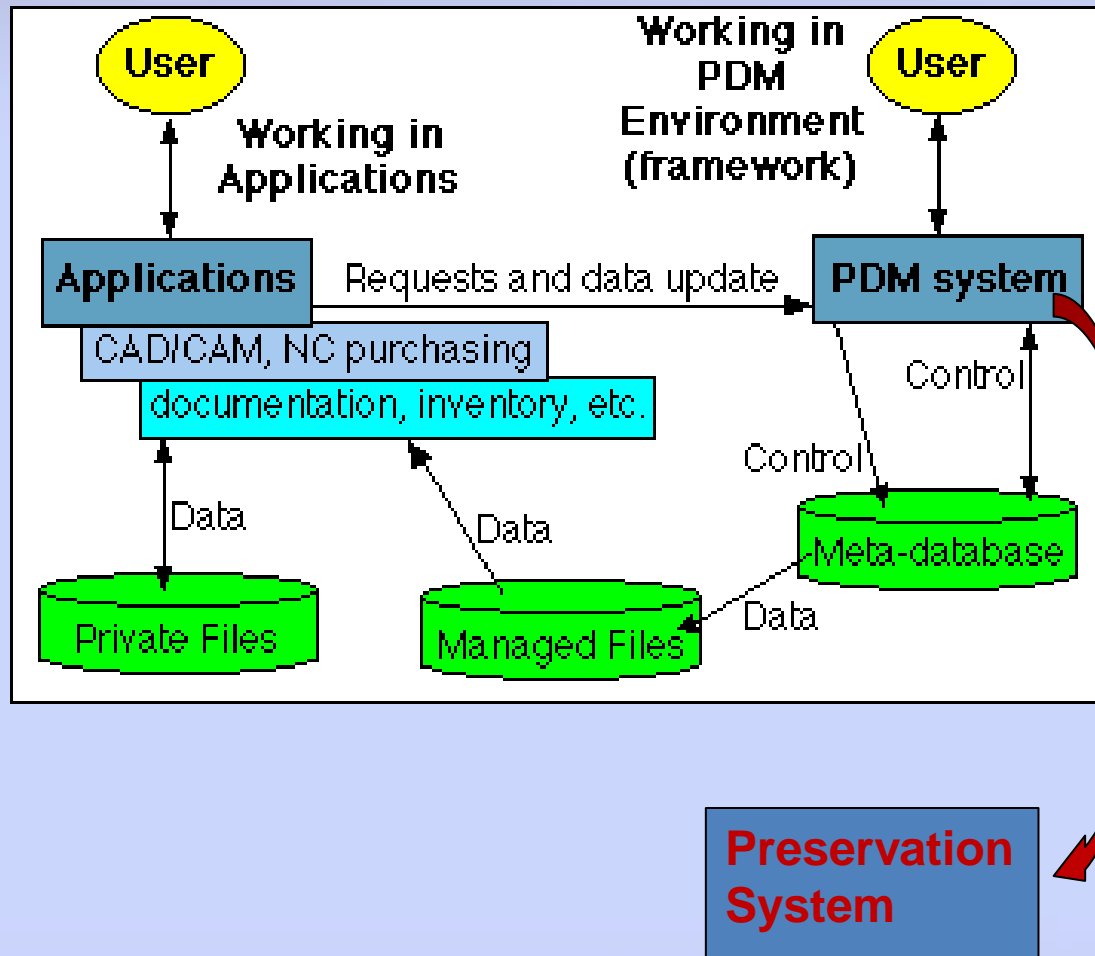
- Appraisal of objects relevant for archival
- Normalization
- Compilation and enrichment of objects to preserve
- Creation of Submission Information Package (SIP)



- Exploitation of digital object by consumer
- Often re-purposing of digital objects
- Potential outcome
 - Creation of new digital objects
 - Revision of digital objects
 - Extension or update of metadata
 - Annotation

- Search capabilities in structures
- Receiving and Examination of Dissemination Information Packages (DIP)
- Adaption and integration of digital objects into working environment
- Recontextualize digital objects and accompanying information for prospective reuse

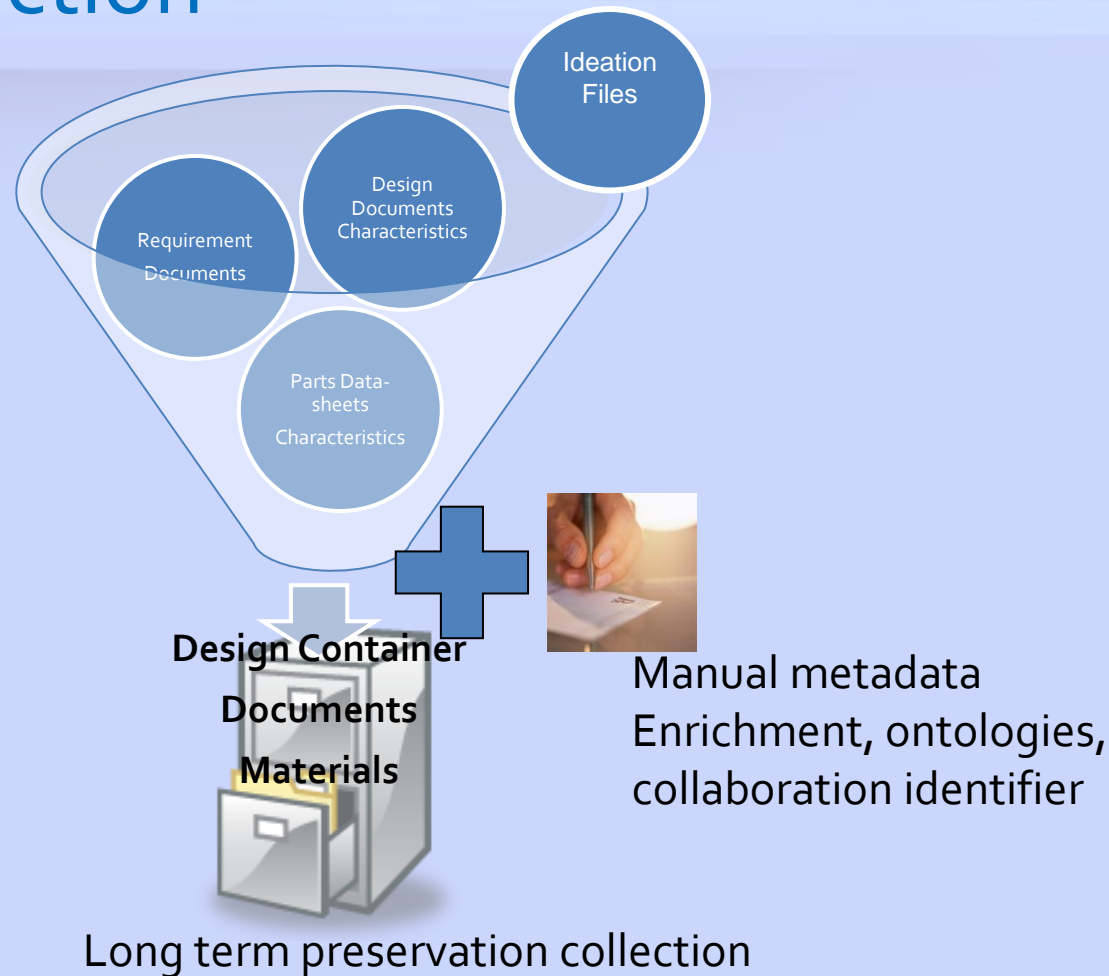
- Life-time of objects inside archive
- Often, perpetual activity
- Enable use by designated community
- Management of Archival Information Packages (AIP)



PDM/PLM (Product Data / Lifecycle Management) is established in the majority of companies as the central repository for product data. This includes beside Engineering and design data, documentation, bill of materials (BOM), component or part data and manufacturing oriented NC (Numerical Control) files. PDM is the main system to control the release process in engineering.

Transfer from PLM for Pre-Ingest Collection

In|Con|Tec

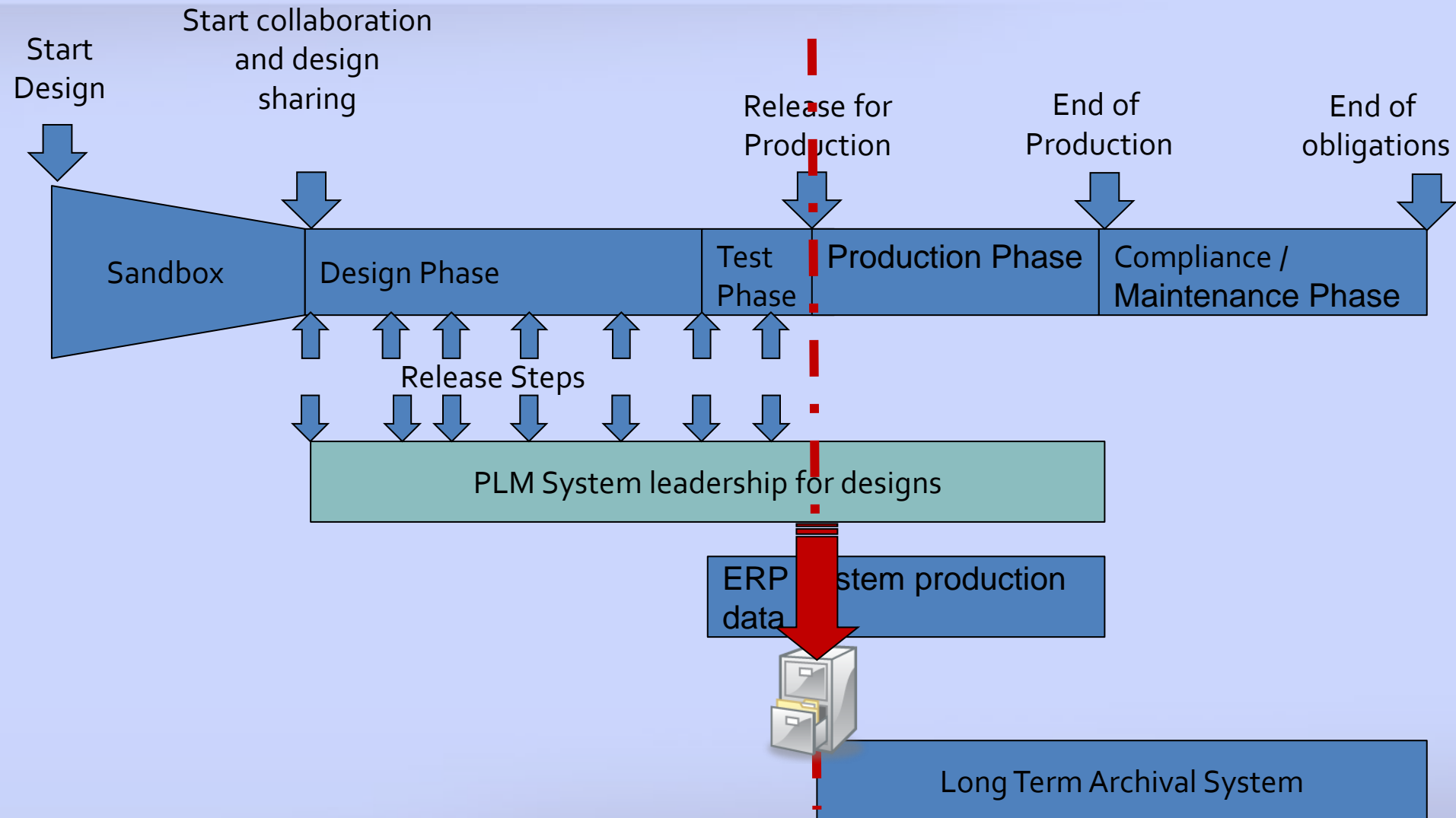


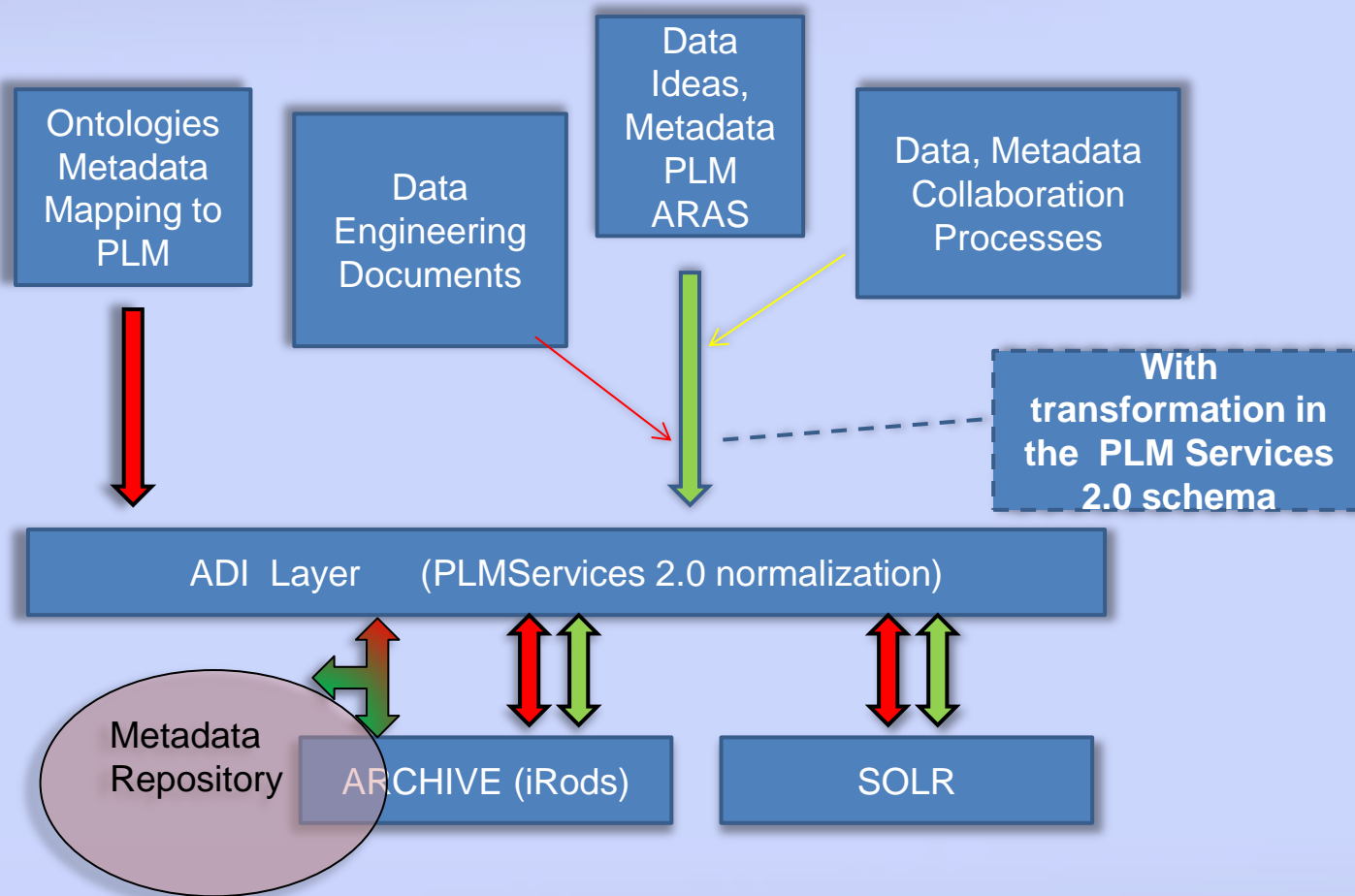


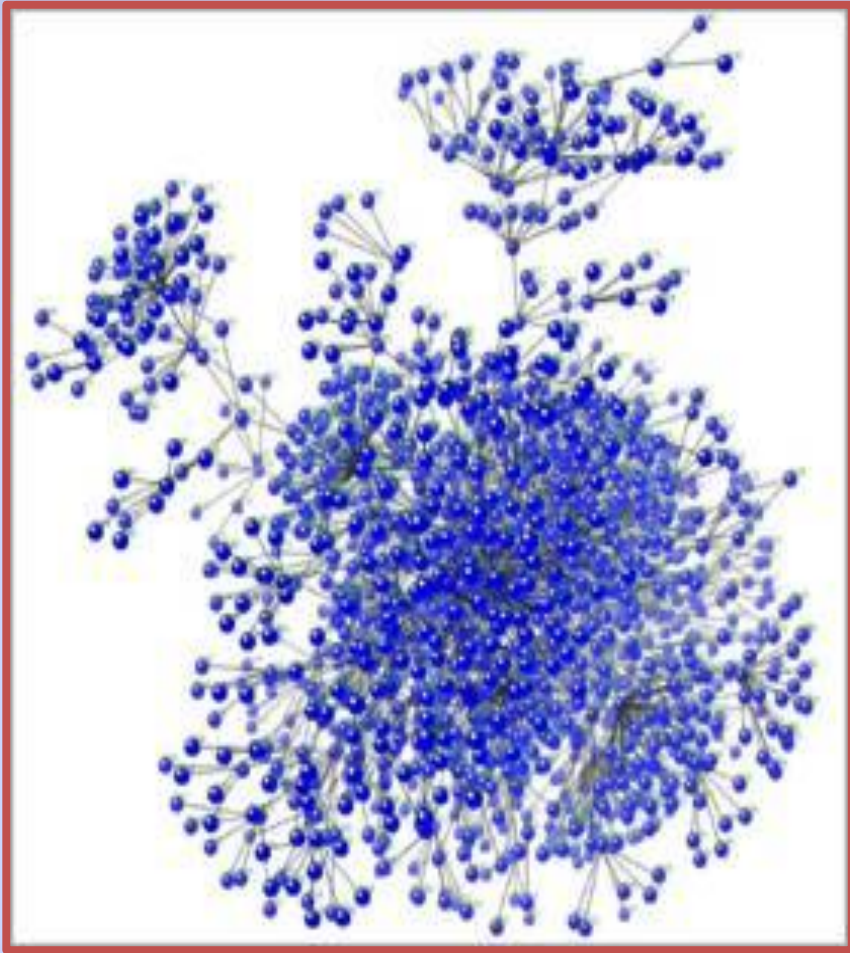
- Collection of product data and their metadata from various *Product Data Management-Systems* (PDM) or *Product Lifecycle Management-Systems* (PLM) for the purpose of long time archiving
- Generation of data container (data, meta data, related digital objects, files, e.g. PDF or CAD data, etc.) with product data in a standardized format PLM2PLM 2.0 (PLMservices)
- Preparation of a GUI to search and query in the archive and to retrieve data from the archive

The Right Point in Time

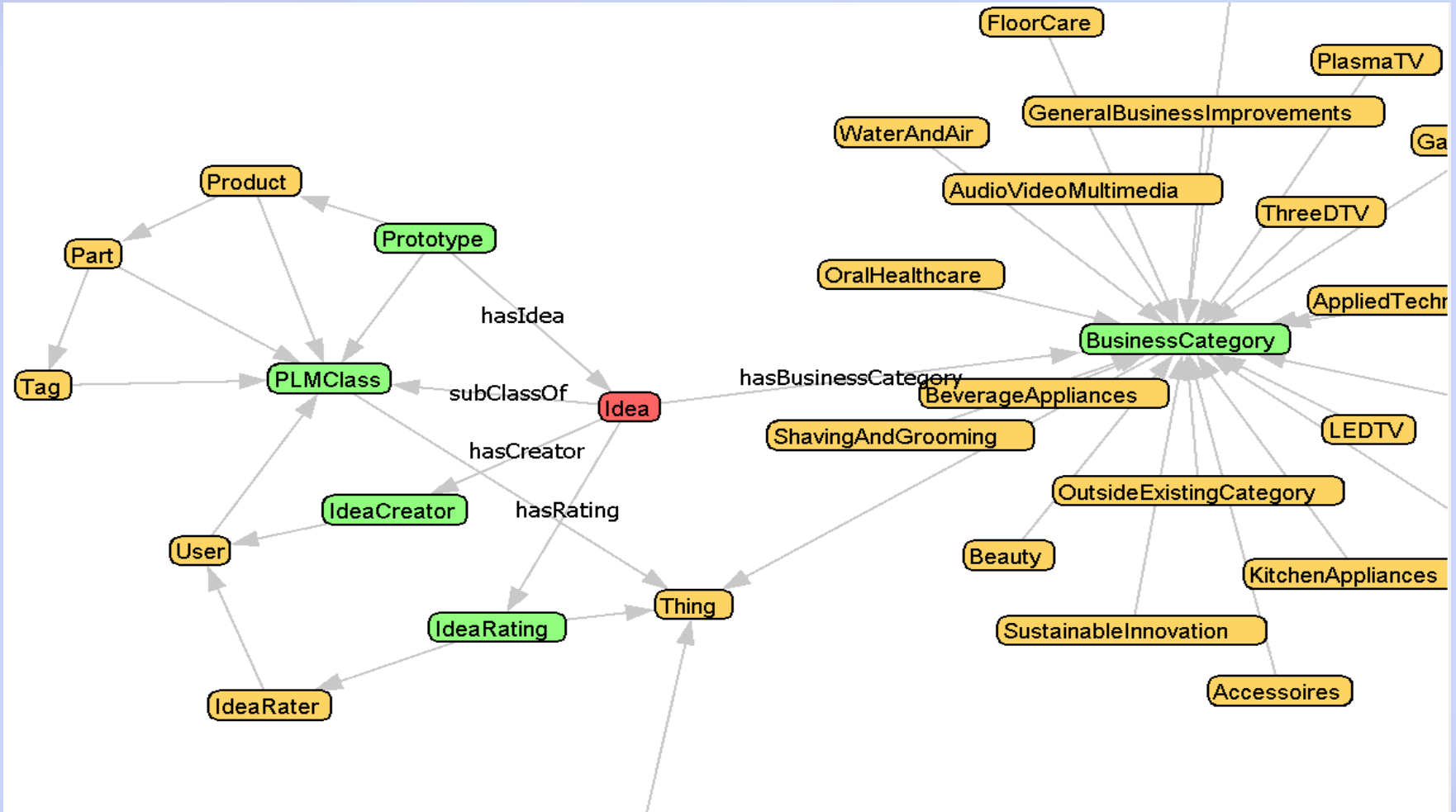
In|Con|Tec







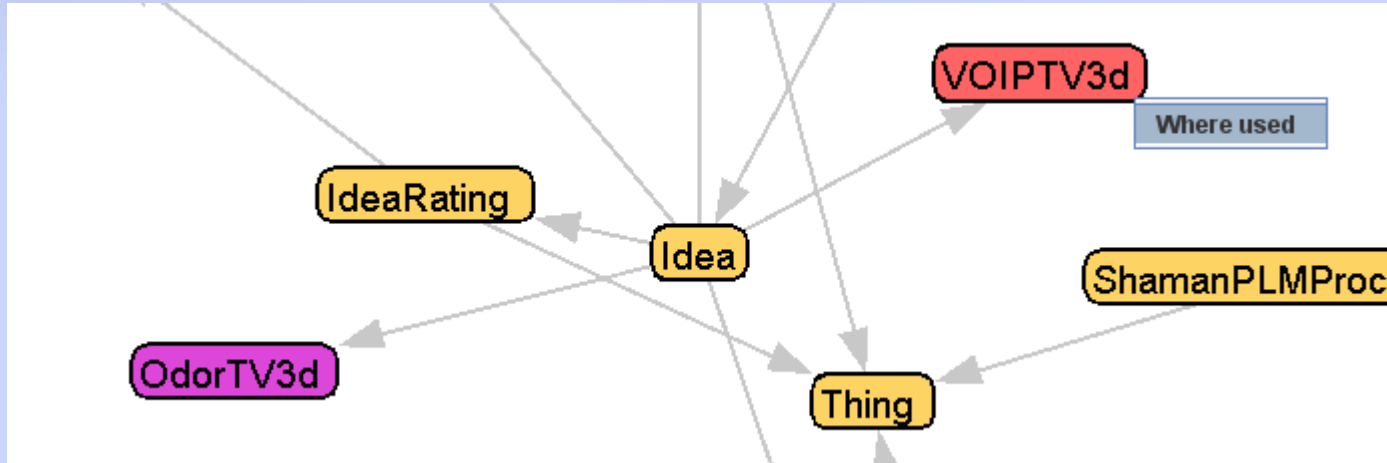
- Generation and collection of ontologies related to the metadata and processes that have been checked-in to PLM or PDM
- Apply the ontologies to the data container in the archive for the purpose of long term ontology based search and retrieval
- Establishment of generic ontologies in the Engineering domain



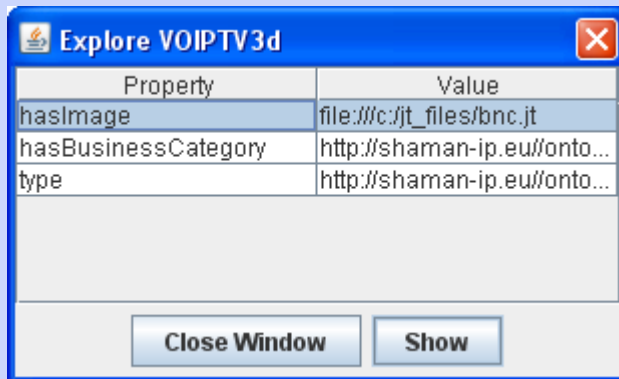
Archive Explorer 3 Steps

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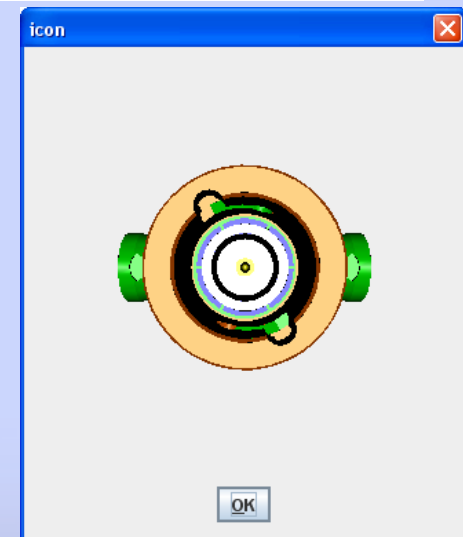
1.



2.



3.





- Provide a shared collaboration platform to review and determine textual and graphical objects
- Allow to create user and user groups that are part of collaboration activities
- Create access to common data container and projects with a user access right philosophy (drafted)
- Establish a common GUI that supports the collaboration process
- Archive the collaboration members, their environment, their access rights and the process of the collaboration activity

Collaboration with embedded JT-Viewer

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Decision Room

This is the decision room for the selected project. Here you can exchange messages with your peers and collect task decisions.

[Decision Room | set nas toggle](#)

Decision Room Service for project LC1_8E_AA

Content Browser

HOME (1)

- vga_connector (0)
- top_tuner (0)
- tv_case (1)
- Dob

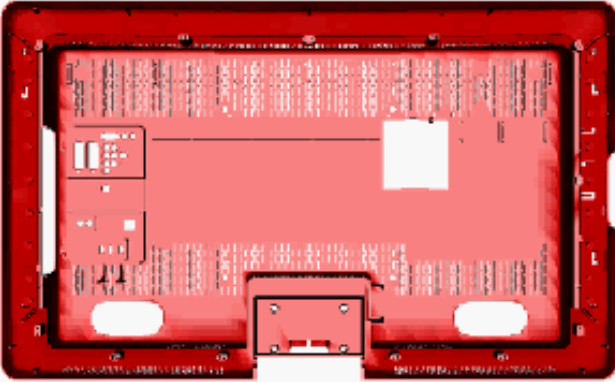
New Artifacts:

Tasks

There are no tasks.

Enter new task:

Viewer



Chat

Last 10

Ker! 24.01.2012 17:40:35

Alice, please talk to Bob, he has some questions concerning the mounting holes.

Enter your message...

Start Pre-Ingest from PLM

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The screenshot displays the Aras Innovator web application running in a Microsoft Internet Explorer browser. The main interface includes a left-hand navigation tree with categories like Administration, Design, and Products. The central area shows a search results table for 'Colour Television' with columns for Product Number, Name, and Description. A pop-up window titled 'CMAction_AddToArchive - Microsoft Internet Explorer' is overlaid on the main content, displaying the message 'Archiving started!'. The bottom status bar indicates 'Ready' and 'Items 1-1 of 1. Page 1 of 1'.

Product Number	Name	Description
LC4.8E AA	Colour Television	Colour Television

Product

Created By: Innovator
Created On:
Modified By:
Modified On:
Locked By:
Major Rev:
Generation:
State:

Archiving started!

Ready

Items 1-1 of 1. Page 1 of 1

- ❑ Provides long-term access to data formats: parses and renders the original data
- ❑ Written using pure Java for portability and HW independence, no native components (to support future execution within the Java VM)

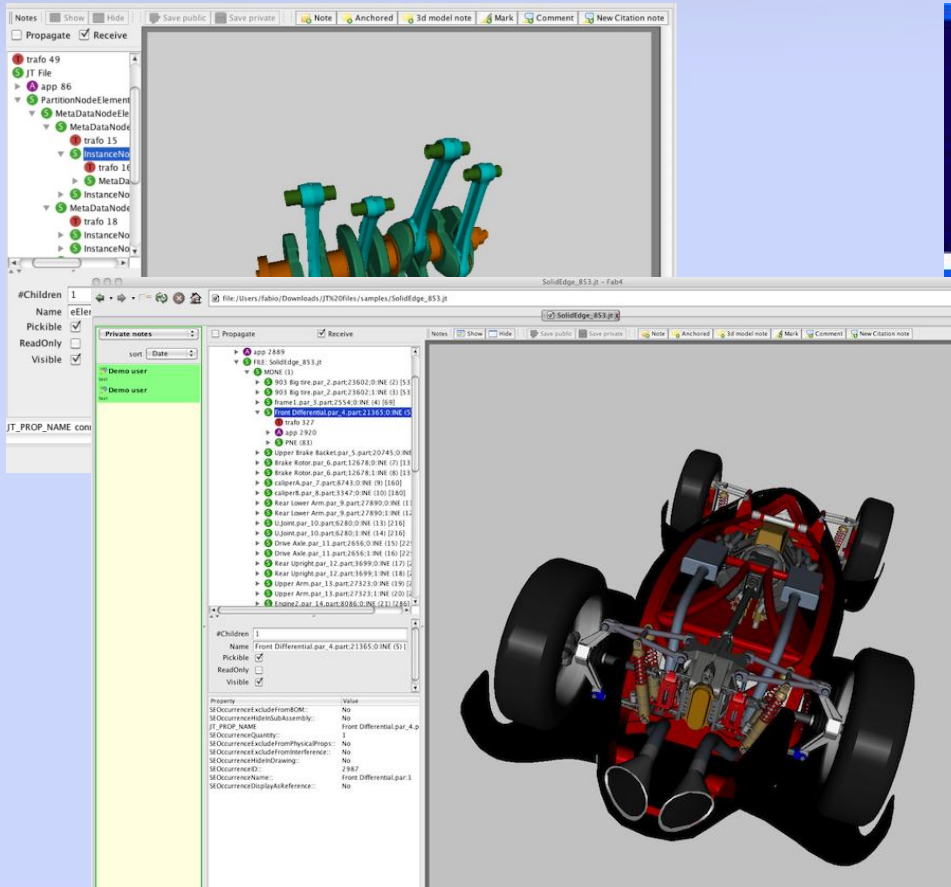
- ❑ Providing access to original formats supporting user interaction
- ❑ supporting annotation,
- ❑ font metadata extraction,
- ❑ access aid (thumbnails)
- ❑ spanning document, video and CAD models.

- ❑ SHAMAN decoder for the Siemens JT format (CAD) 8.1
- ❑ No other open source JT decoding library available
- ❑ Gives programmatic access to JT structures, graph and metadata
- ❑ Pure Java, no native libraries used, LGPL license
- ❑ Extracts geometry, and offers a graphic representation (using Jreality*) of the JT files, also in pure Java
- ❑ Integrated in Multivalent

* Projects and source code: <http://code.google.com/p/jt-java/>
<http://www3.math.tu-berlin.de/jreality/>

J-T Models, PPT, Video Clip presented with FAB₄ Browser

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- ❑ Representation rendering software: allows access to representation information, (specifications etc. since those are also described in a data format)
- ❑ Access software: “presents some or all of the information content of an information Object in forms understandable to humans or systems*”
- ❑ Multivalent can fit both roles, in the long term (given that the JVM is ported to future architectures)

* OAIS reference architecture

Role of Multivalent in the Scope of OAIS

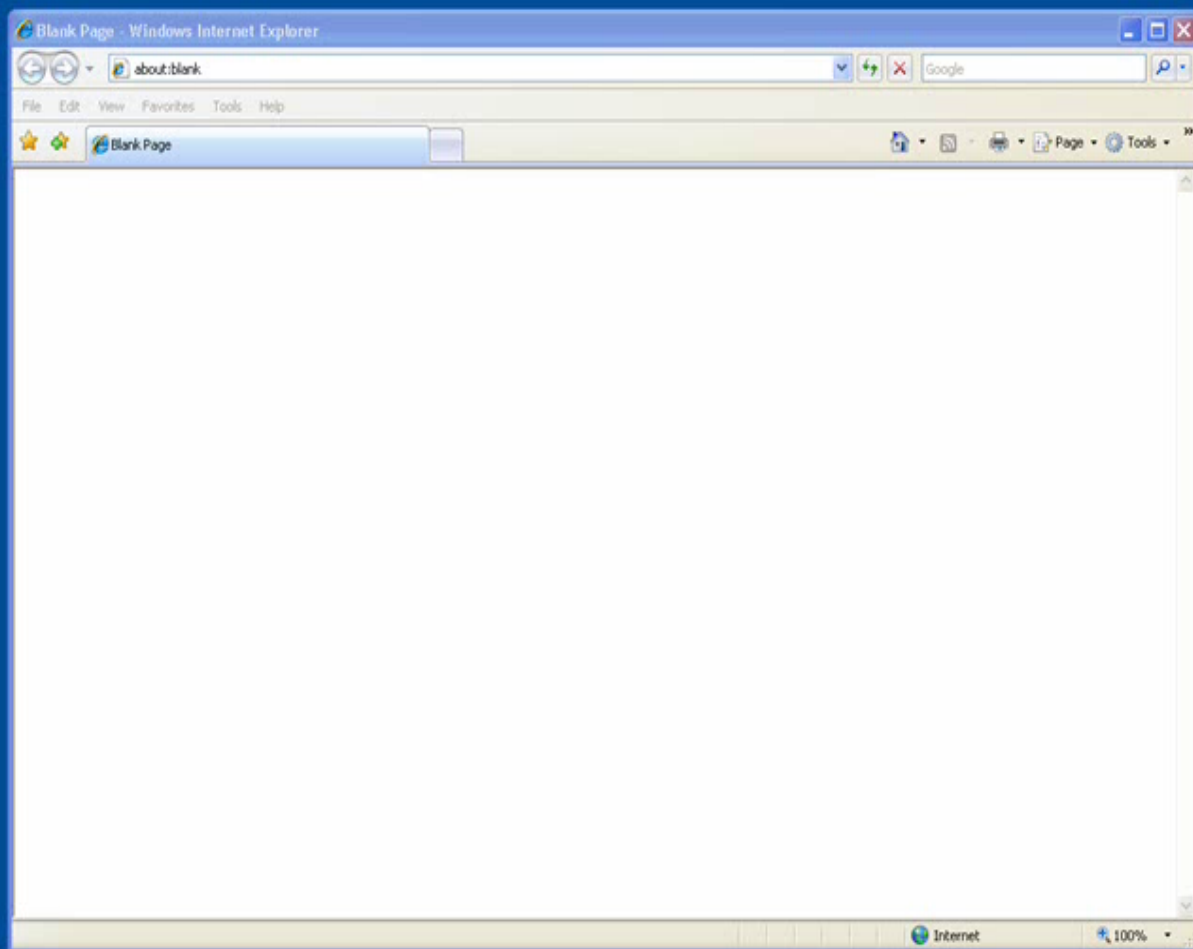
❑ On Ingest:

- Quality assurance (file format identification and validation)
- Generate descriptive information (extract metadata, extract standardised content for indexing)

❑ On Access:

- Parse and display/present information (access software) in the long term
- Development of new media adaptors (support for more file formats!)

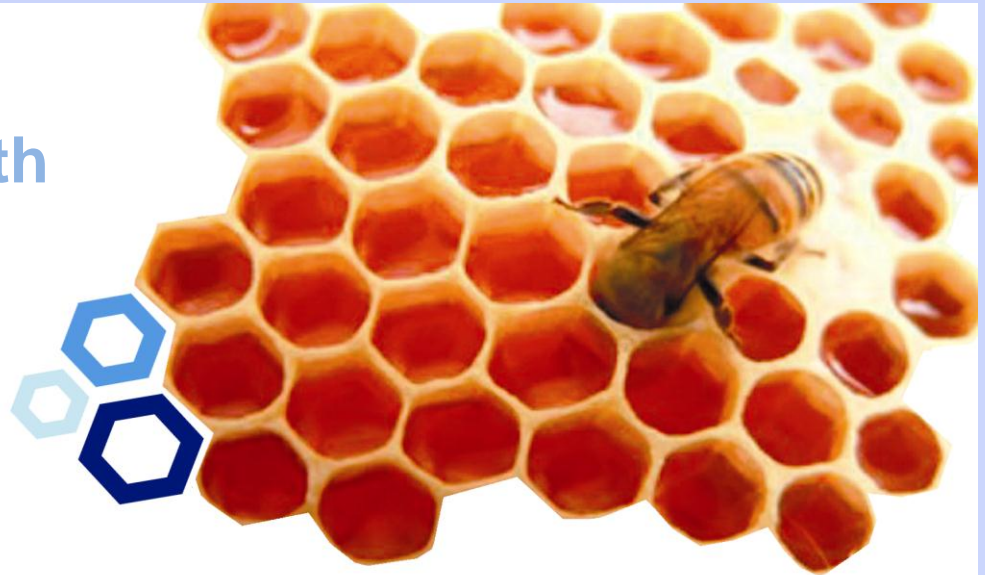
- ❑ Hardware preservation (computers break!)
- ❑ Emulation (information is trapped)
- ❑ Migration / Conversion (unpredictable data loss; loss of authenticity)
- ❑ Universal format (sum of all/data loss)
- ❑ Universal Virtual Computer (UVC) from Lorie
- ❑ **Multivalent** (Java VM is the UVC)



Thank You for Your Attention

In|Con|Tec

Securing
Communication with
the future



SHAMAN

Sustaining Heritage Access through Multivalent ArchiviNg