



Apr eser vation voice in t he t echnical wilder ness
Ar chiving of Dig it al 3D Assembl ies

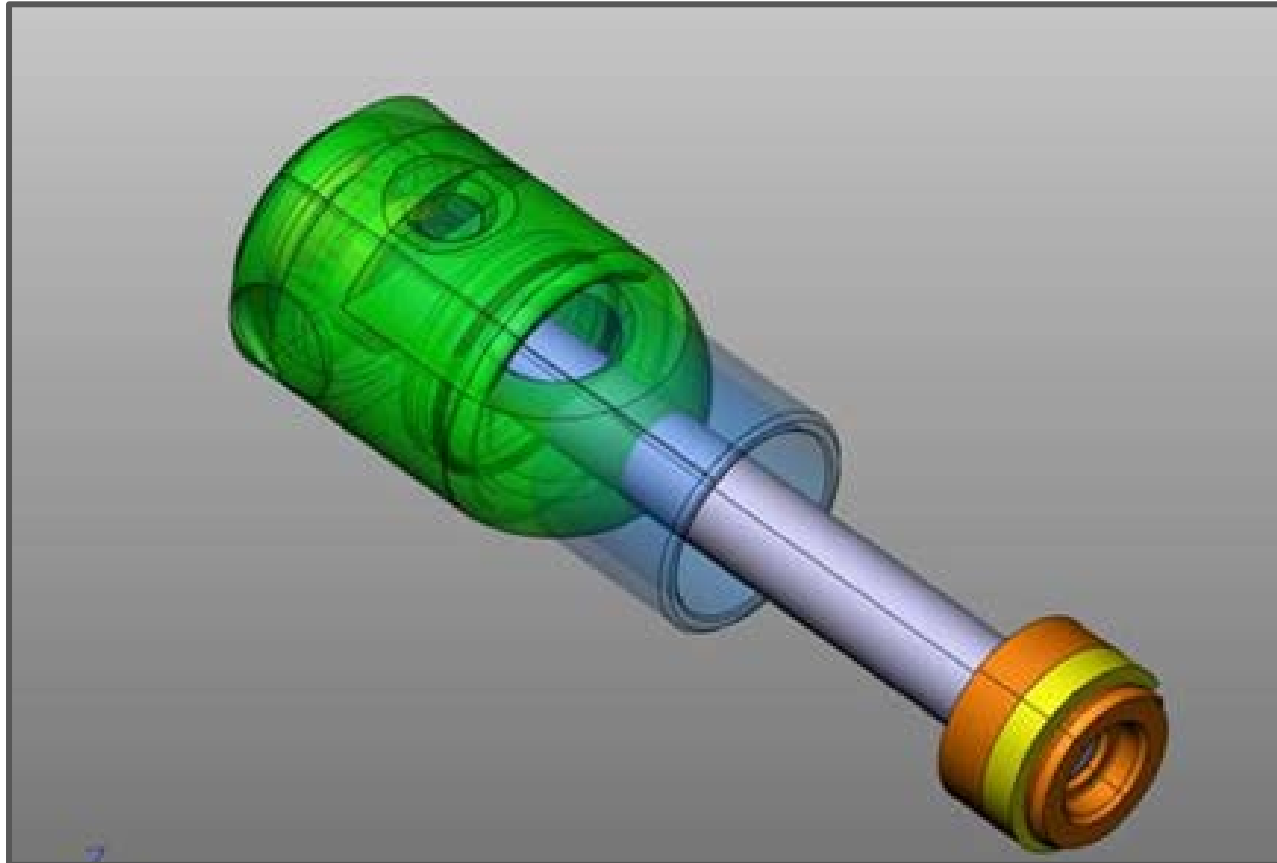
Uwe H. Helber, T-Systems

09.12.2016

T-Mobile-Systems

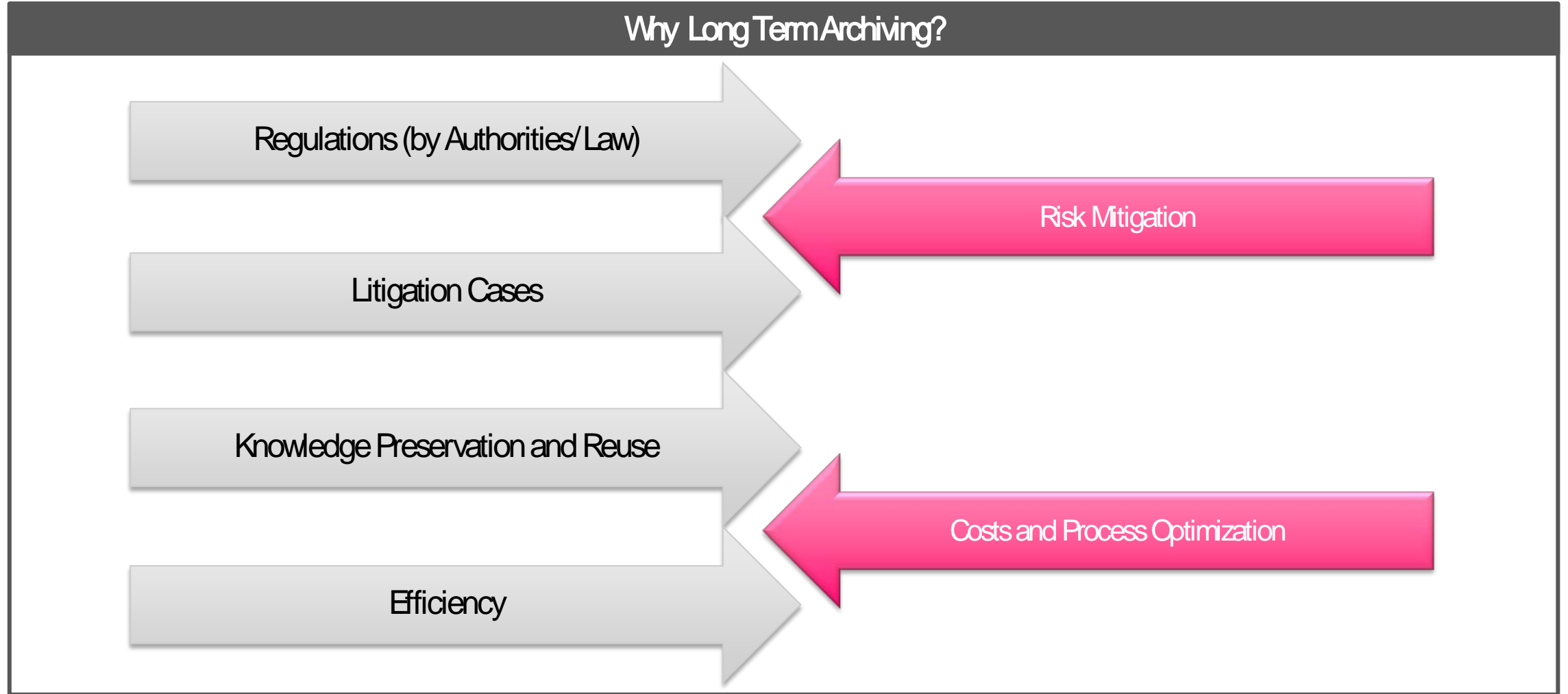
Archiving of Digital 3D Assemblies

DESIGNED 3D OBJECTS/Assemblies



Long Term Archiving

Key Motivation



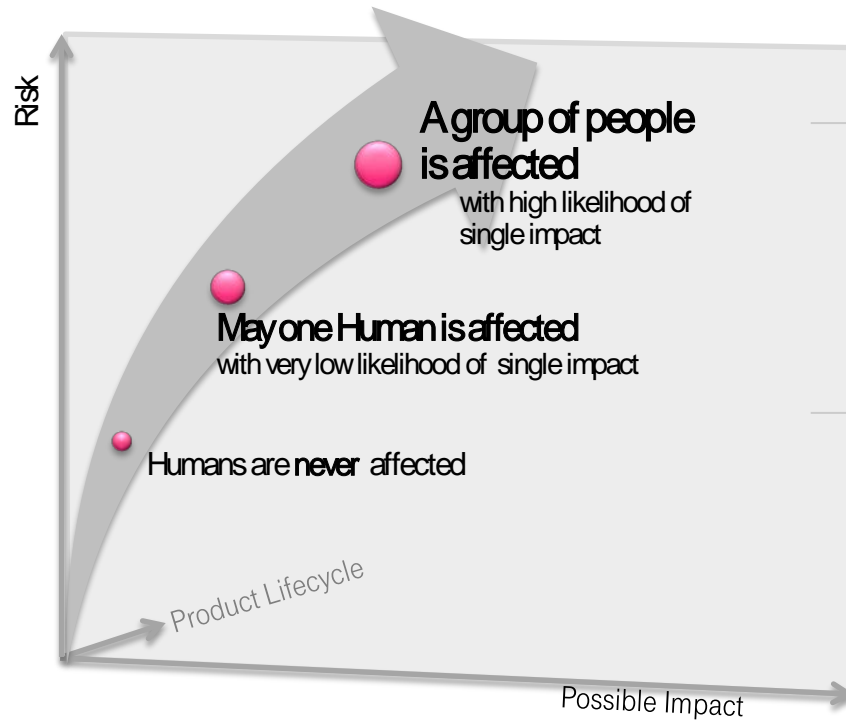
Long Term Archiving Introduction (1)

General Archiving Topics

- According to **product liability** the product design, the product tests, the manufacturing process, the support services have to be documented and the producer need to **be able to provided these documents** during the hole lifetime of the product.
- This means to ensure the **immutability, authenticity and readability of the electronic files** in an archive application over the time - even the lifetime of the product is very long (**70 years and longer**).

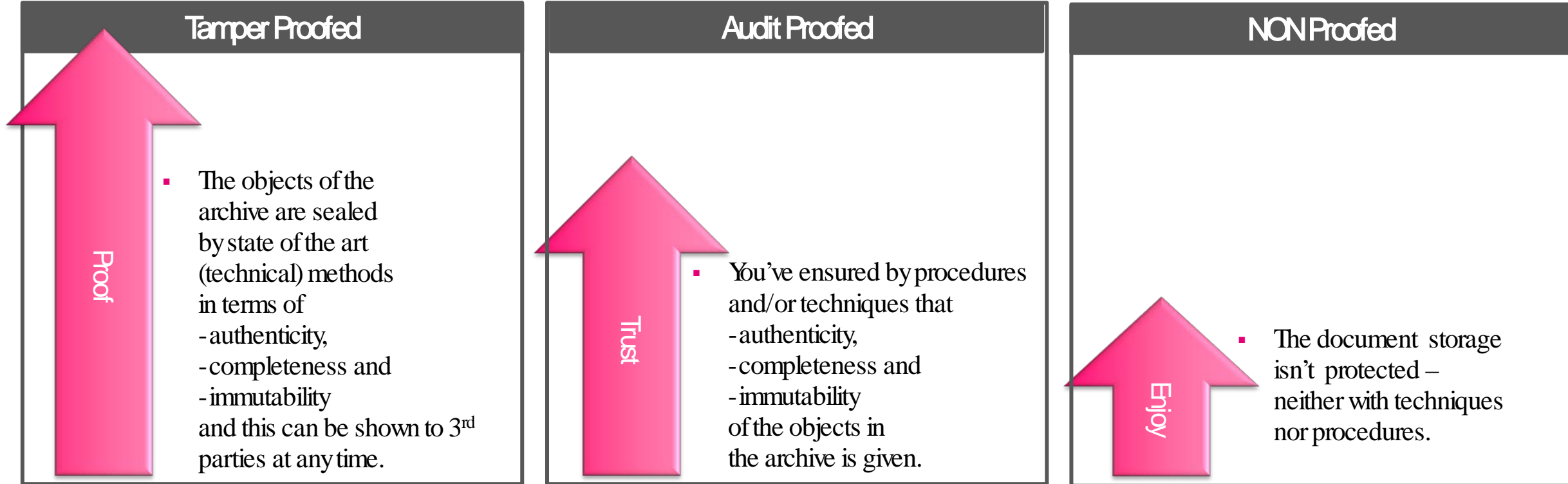
Long Term Archiving Risk Mitigation

Effects of Product Liability

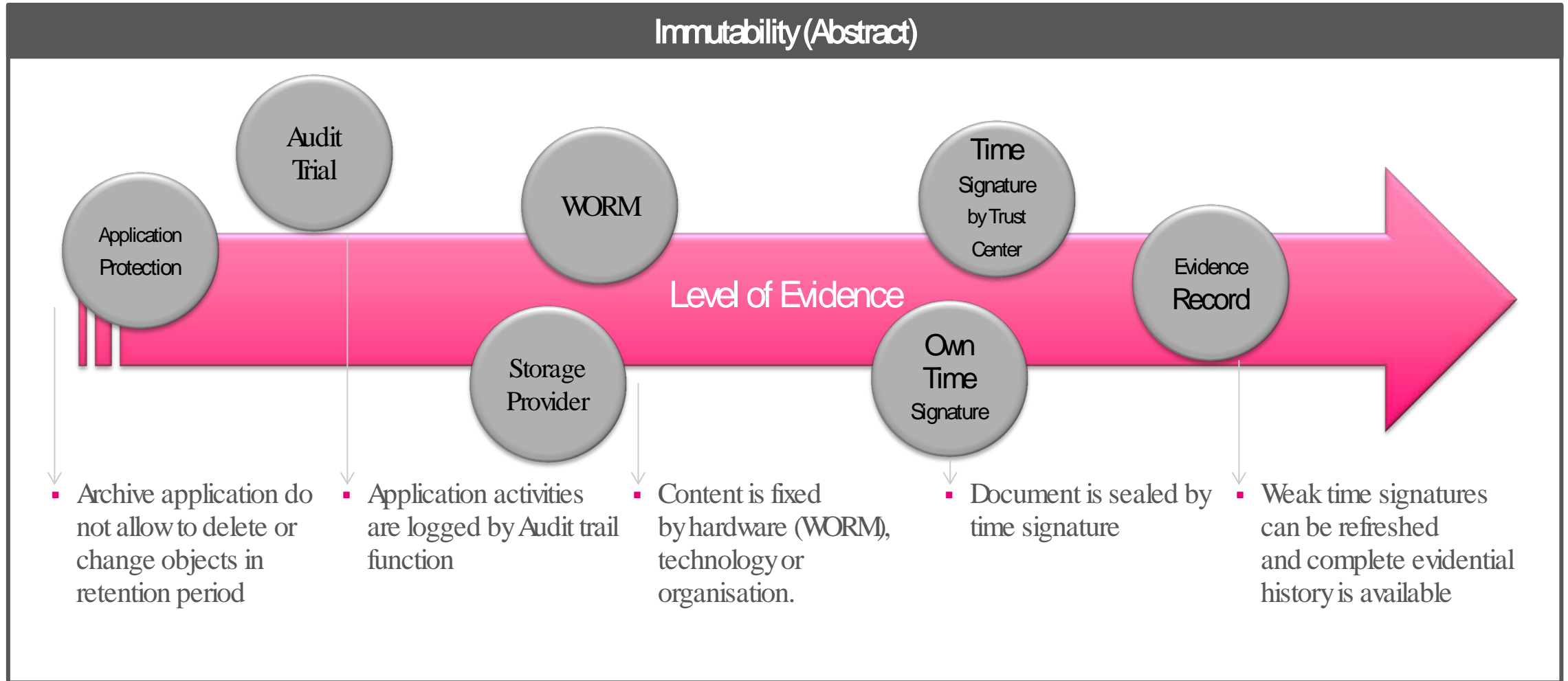


- High risk of issues with possibly high impact (image & budget)
Duration of Product Lifecycle becomes key driver for preservation!
- Product Liability is not the driver.
Preservation can be reduced to pure legal requirements.

Long Term Archiving Quality of an Archive

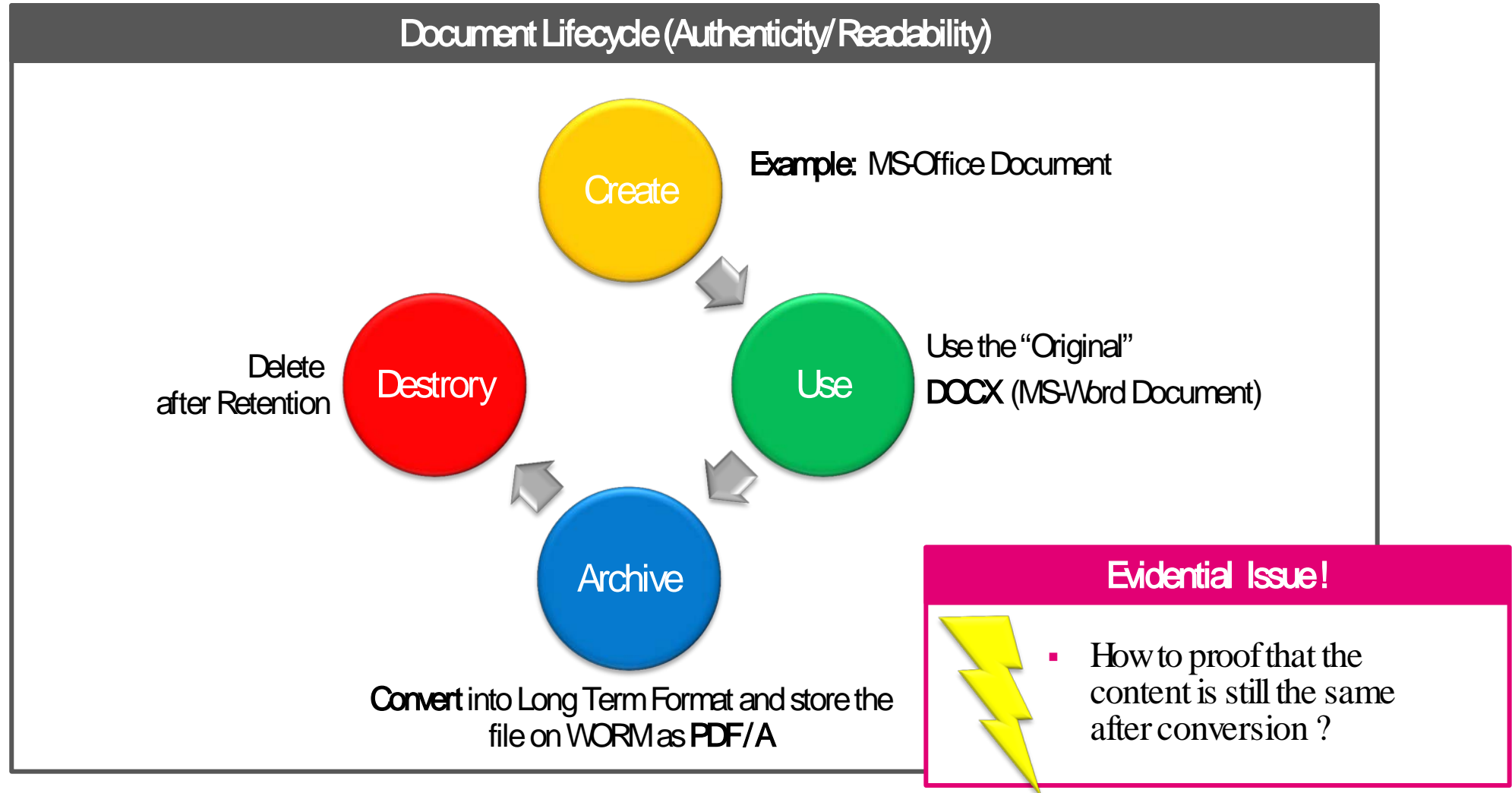


Long Term Archiving Risk Mitigation (2)



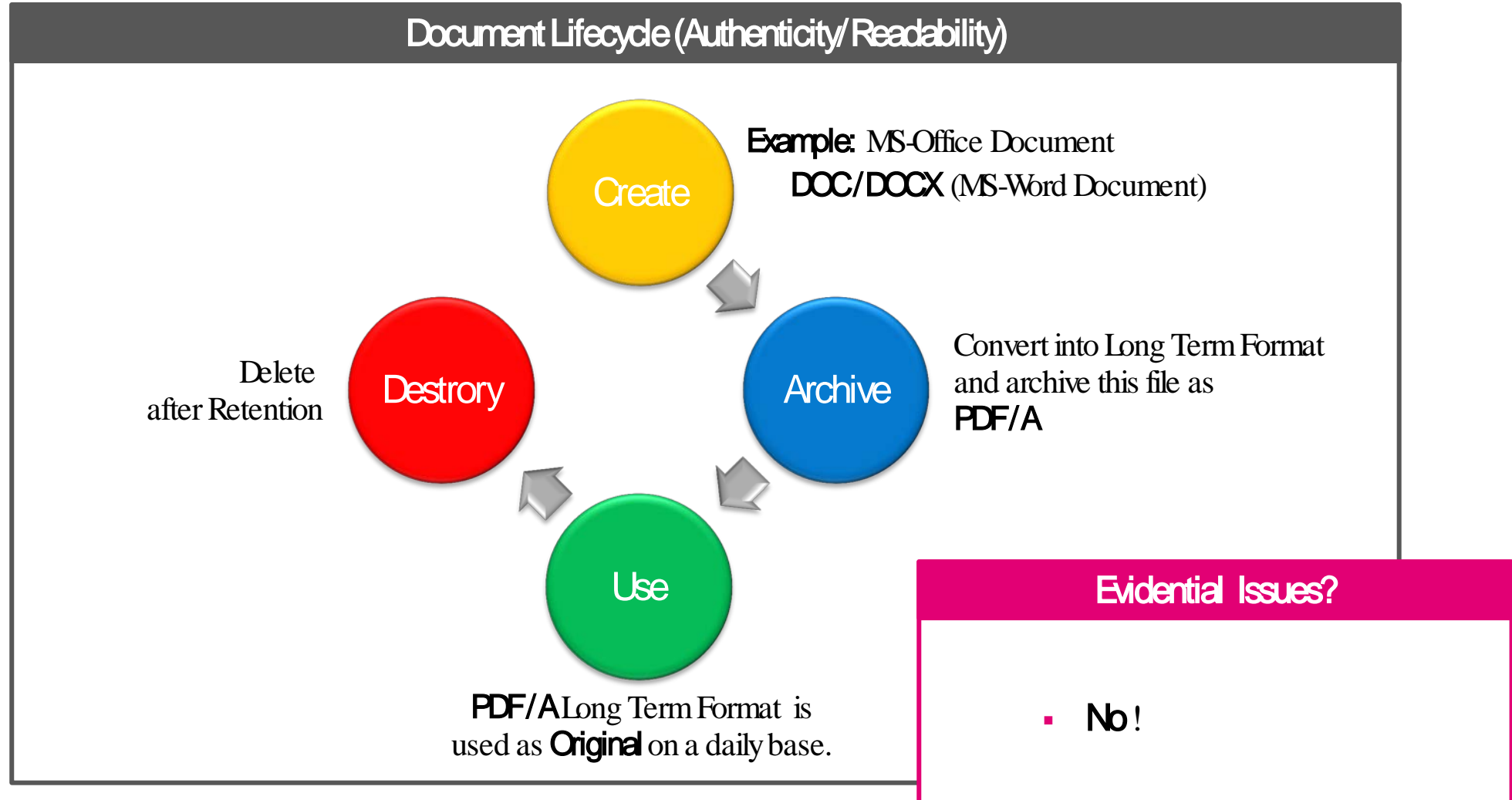
Archiving of Digital 3D Assemblies

Introduction (2)



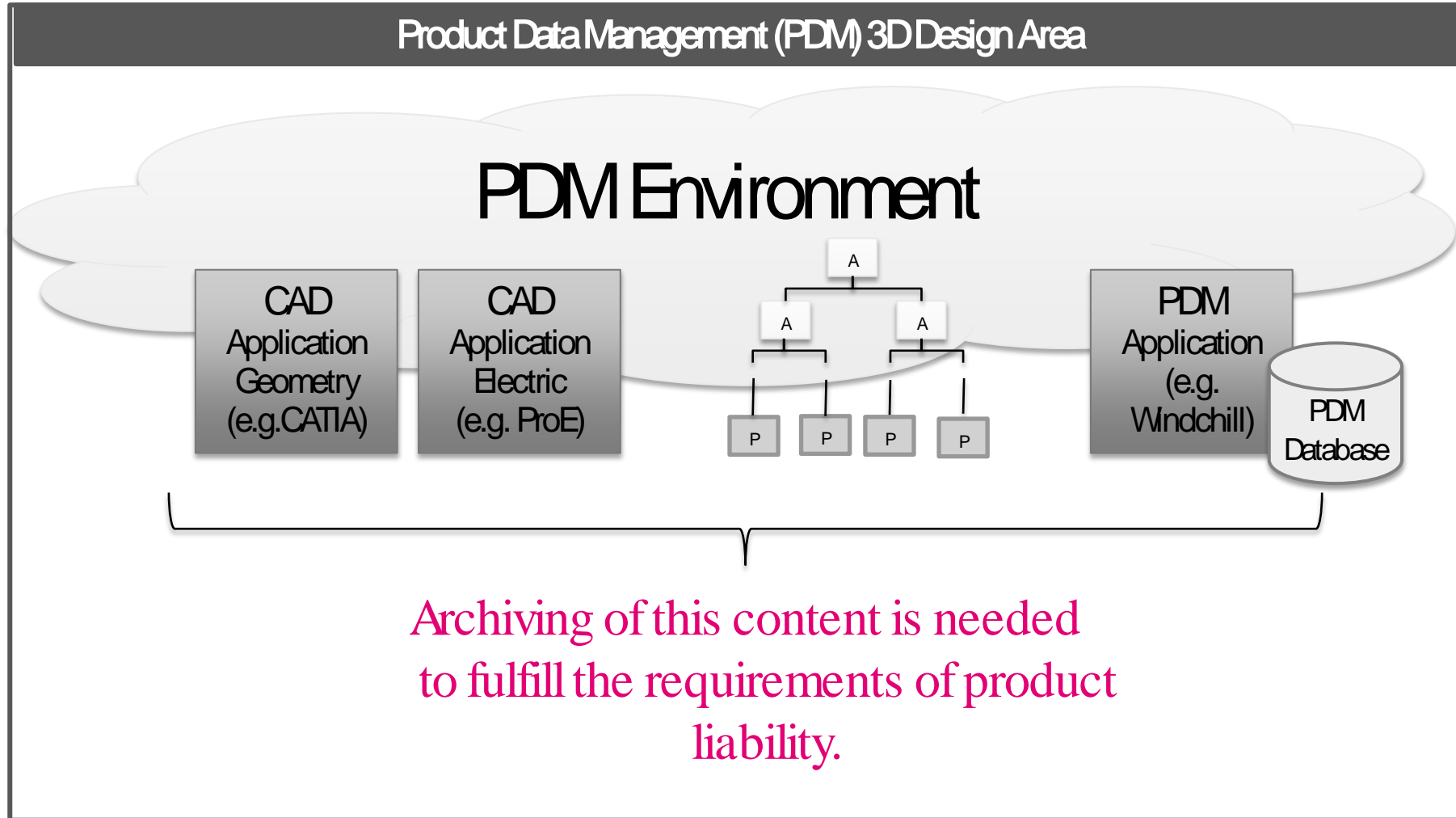
Archiving of Digital 3D Assemblies

Introduction (3)



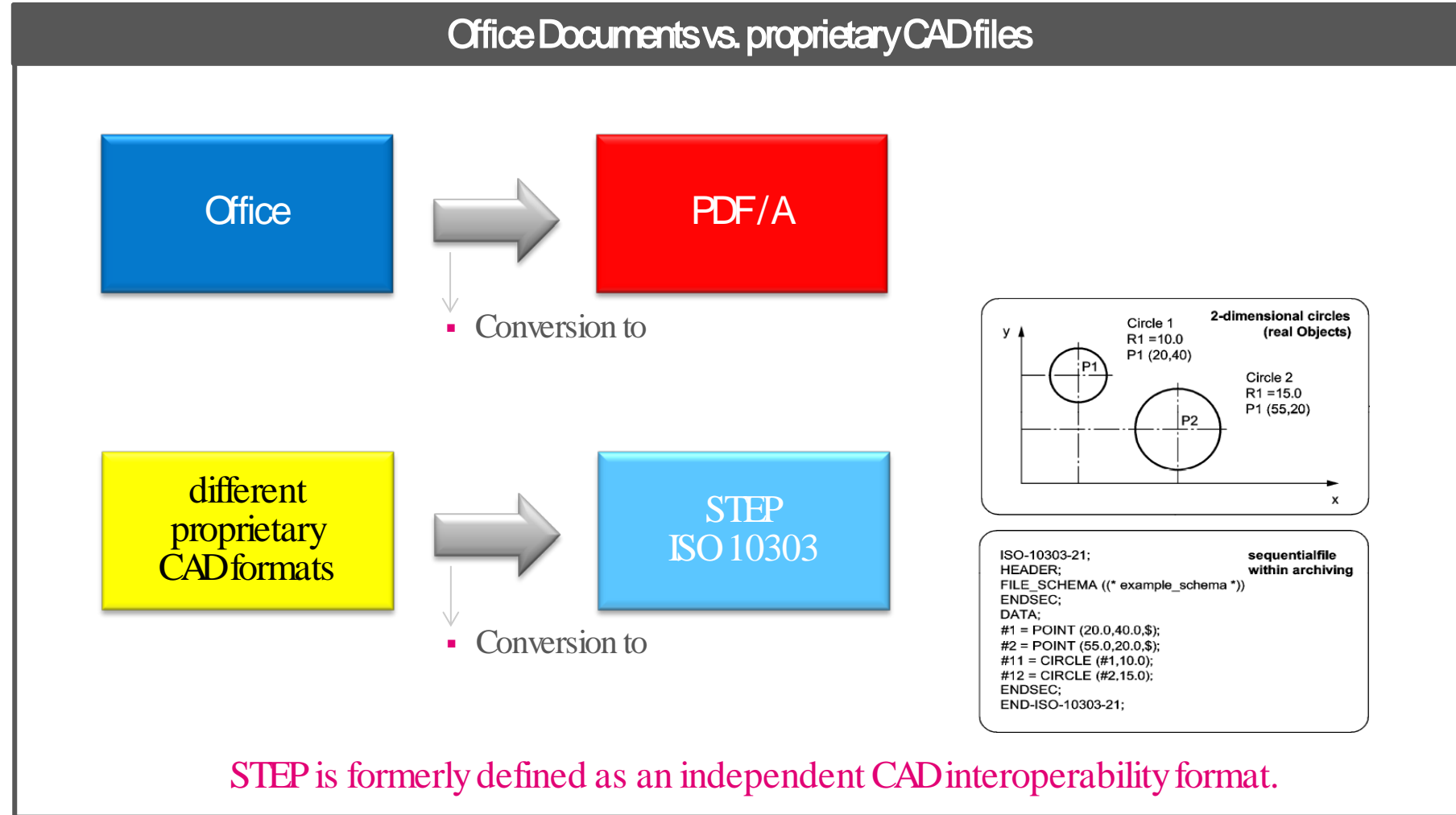
Archiving of Digital 3D Assemblies

PDM Context



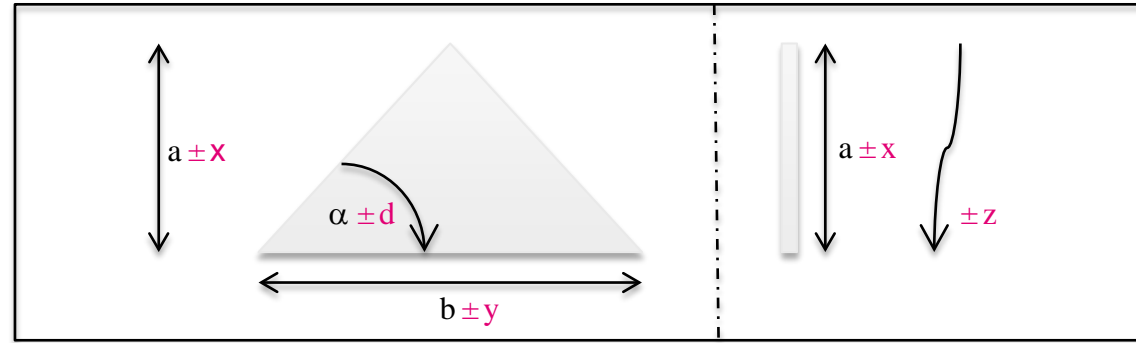
Archiving of Digital 3D Assemblies

LONG TERM FILE Formats



Archiving of Digital 3D Assemblies sSTEP diversity

- 3DCAD Model is not just the representation for the viewing in a browser



- Other items

- Manufacturing Tolerances
- Materials
- Wired Harness
- Electric
- ...

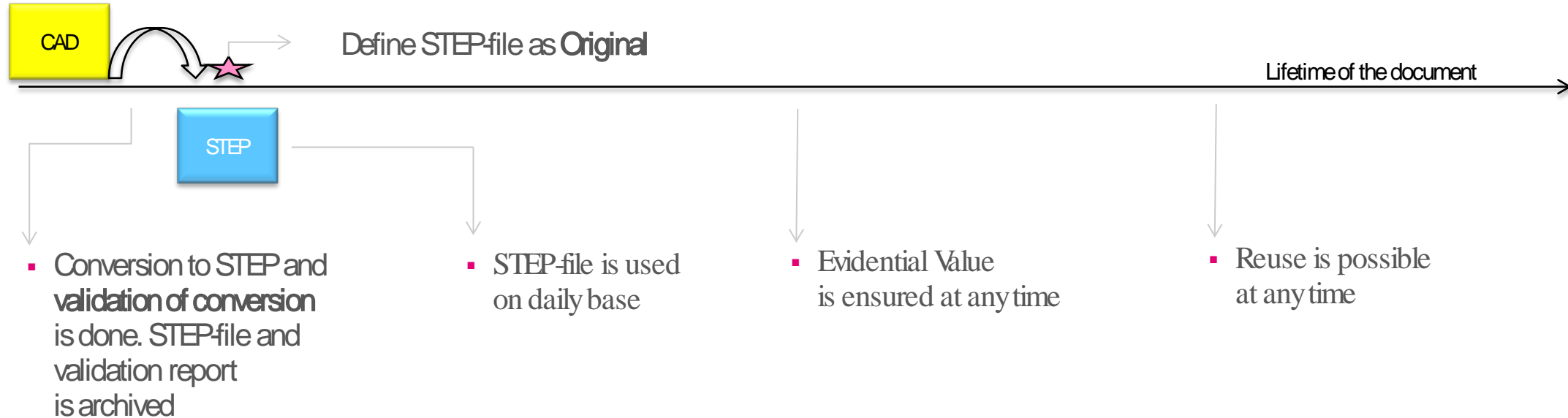
STEP-format have to meet
all business requirements of 3D design.



Archiving of Digital 3D Assemblies

STEP Archiving Lifecycle

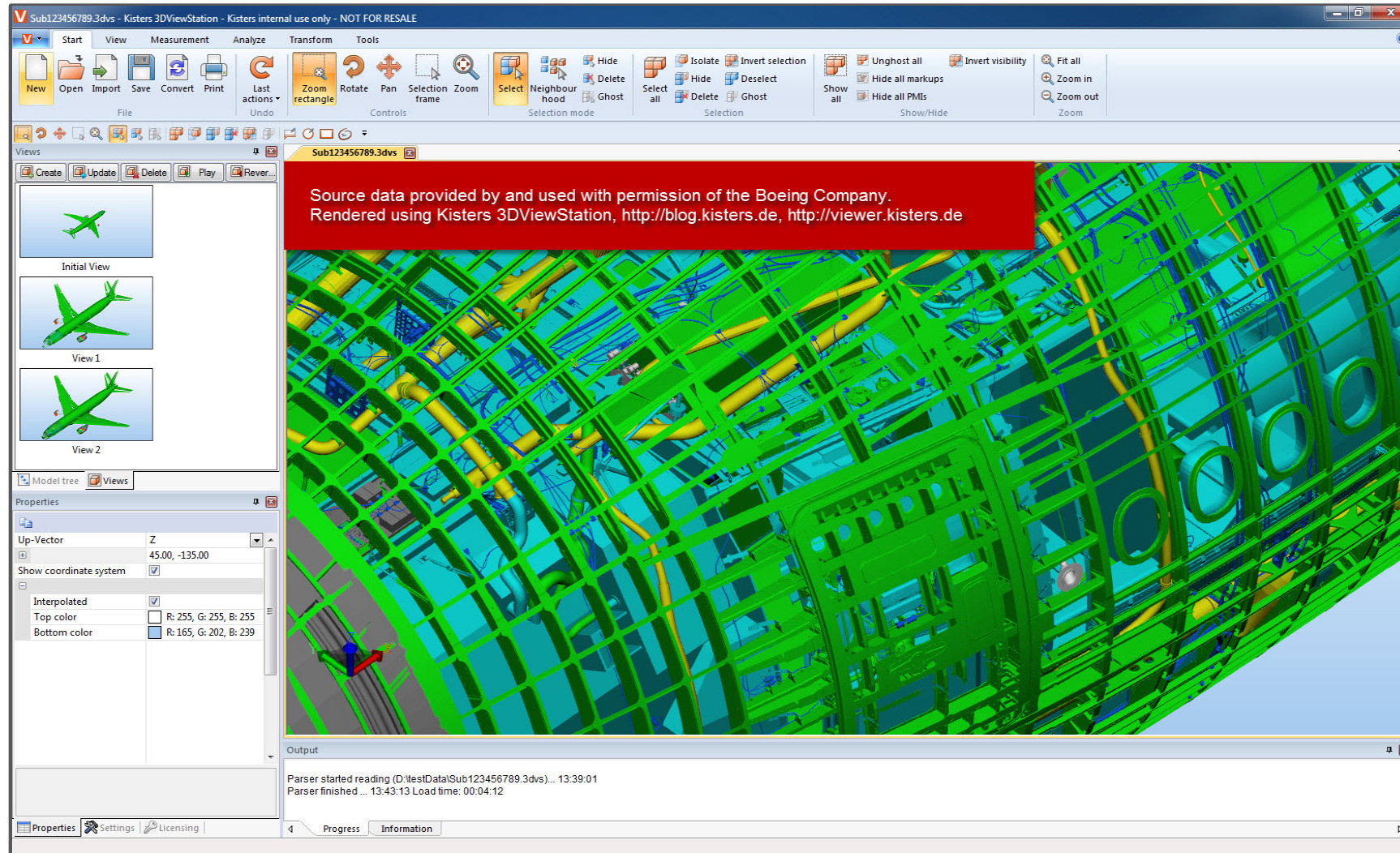
Early Archiving



Archiving of a single STEP/XML-files is still standard archiving

Archiving of Digital 3D Assemblies

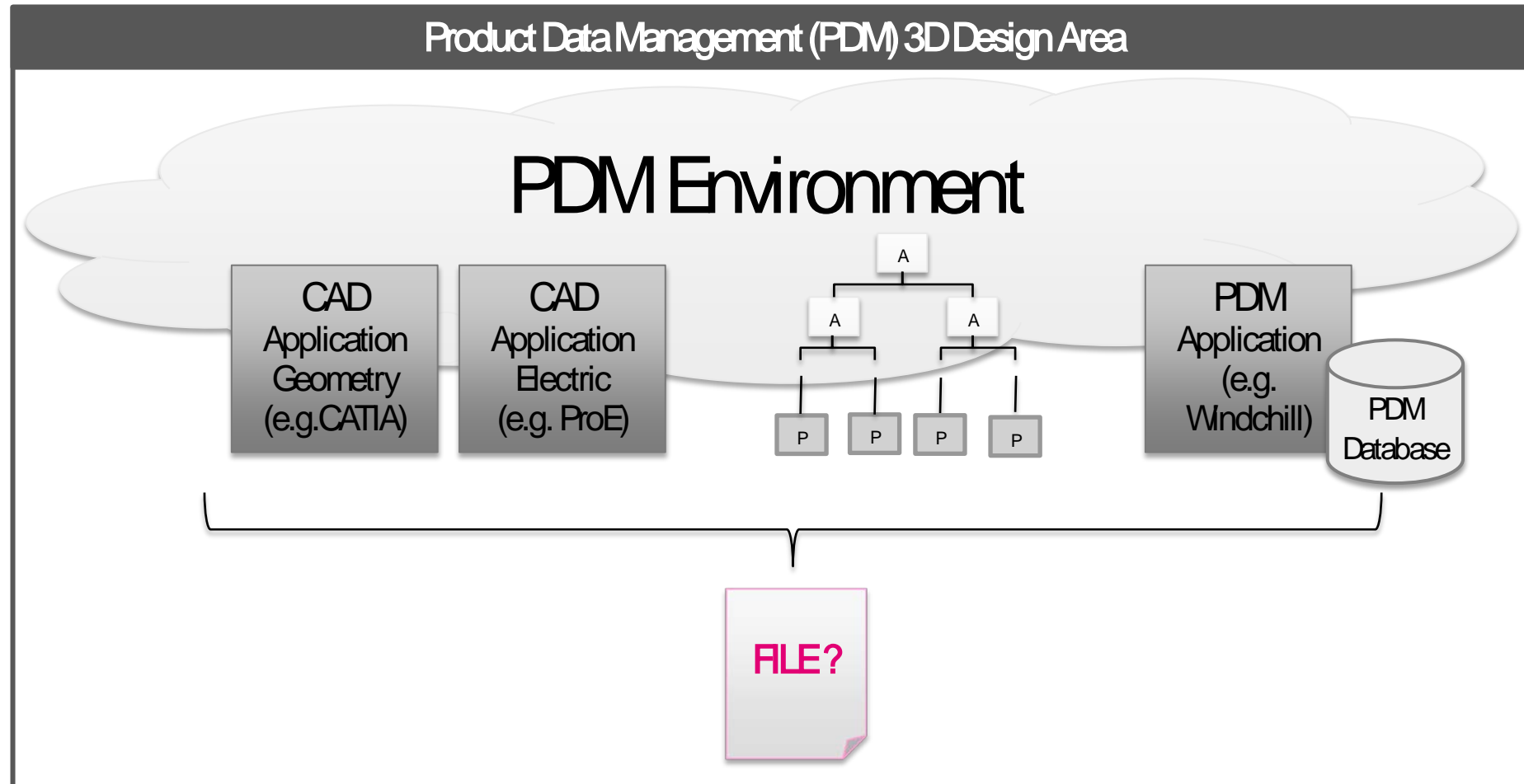
Complexity



Screen Shot: Kisters AG

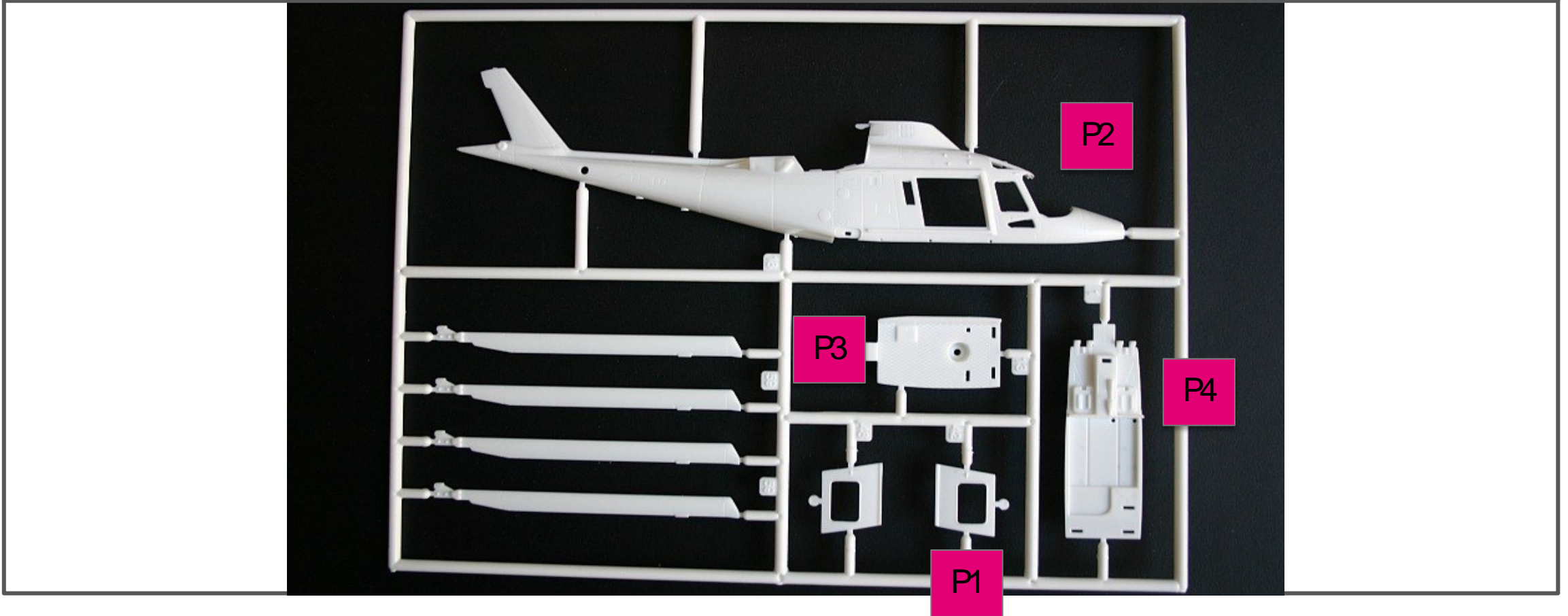
Archiving of Digital 3D Assemblies

PDM Context



Archiving of Digital 3D Assemblies Dynamic Structures @Archive (1)

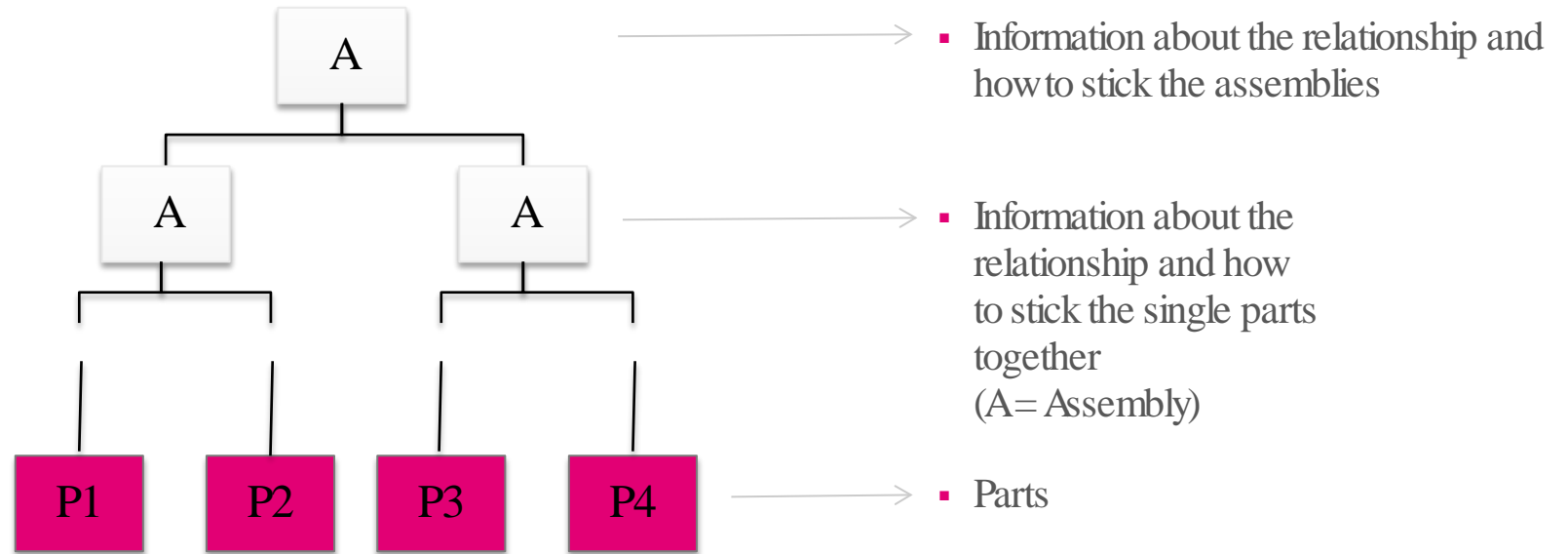
PDM Sandbox (1)



Archiving of Digital 3D Assemblies

Dynamic Structures @Archive (2)

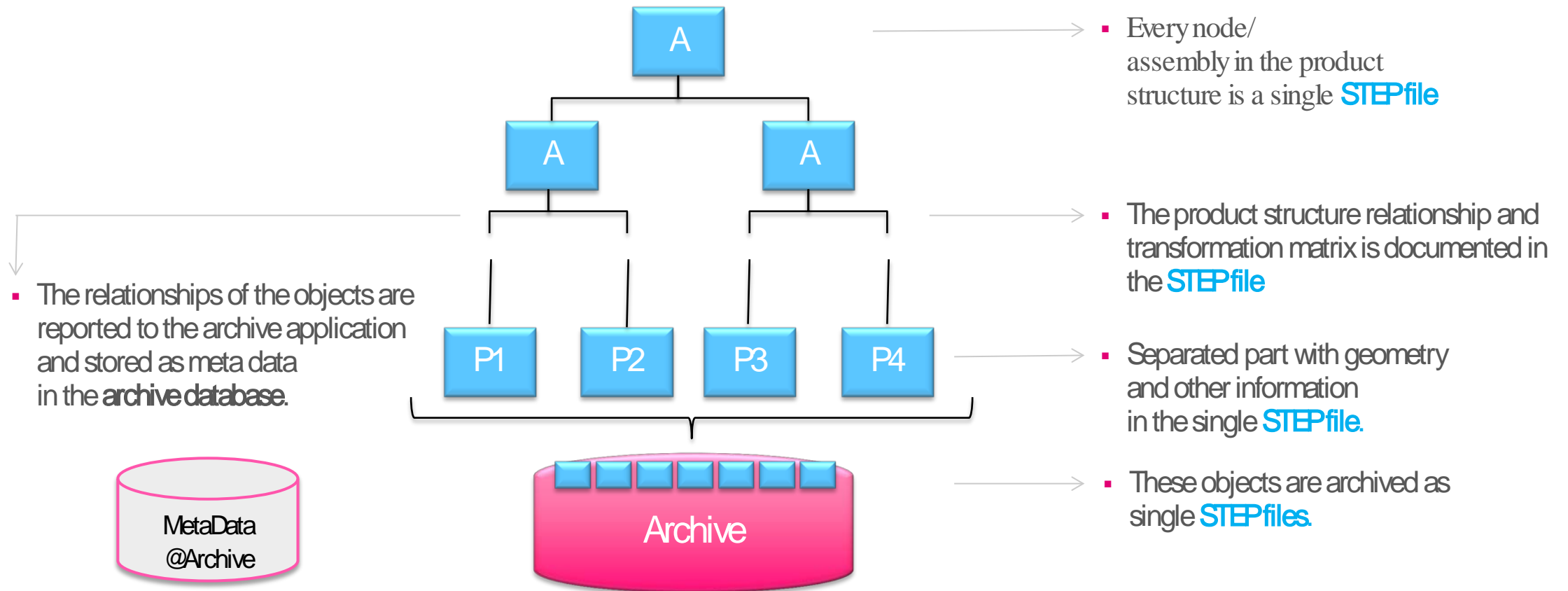
PDM Sandbox (2)



Archiving of Digital 3D Assemblies

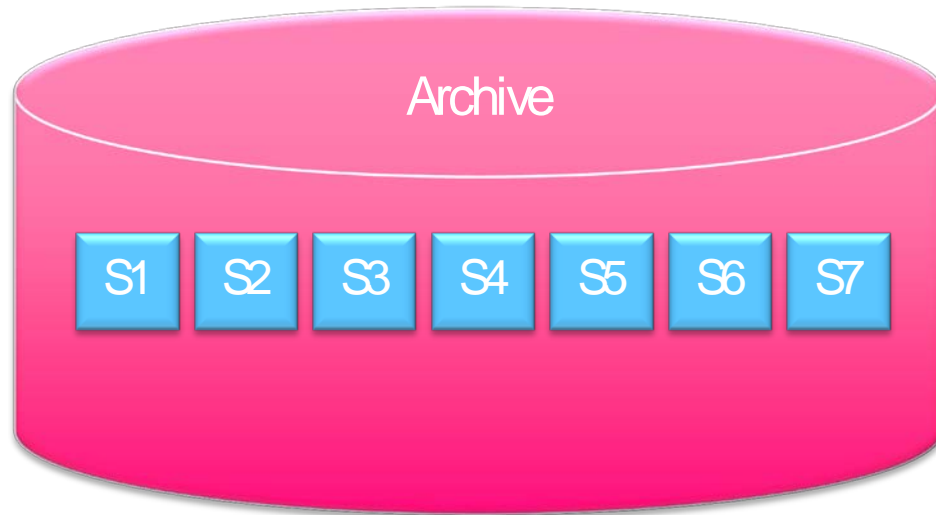
Dynamic Structures @Archive (3)

PDM Sandbox (3)

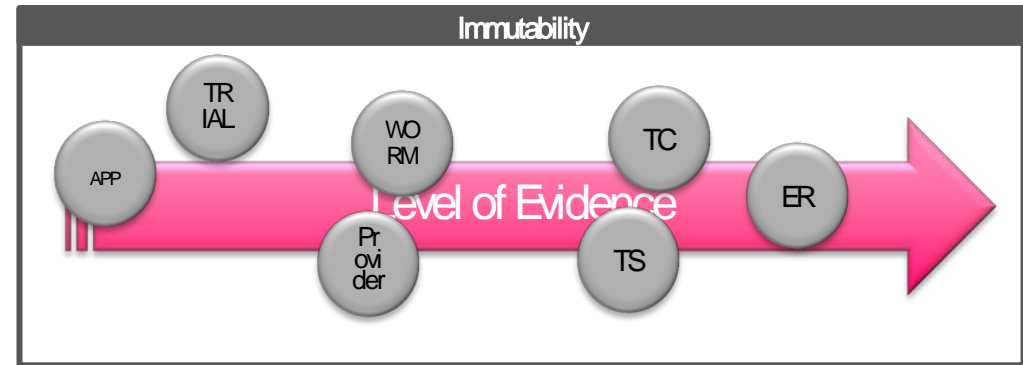


Archiving of Digital 3D Assemblies Dynamic Structures @Archive (4)

PDM Sandbox (3a)

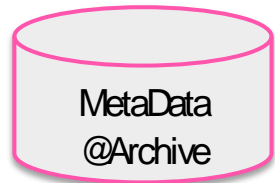
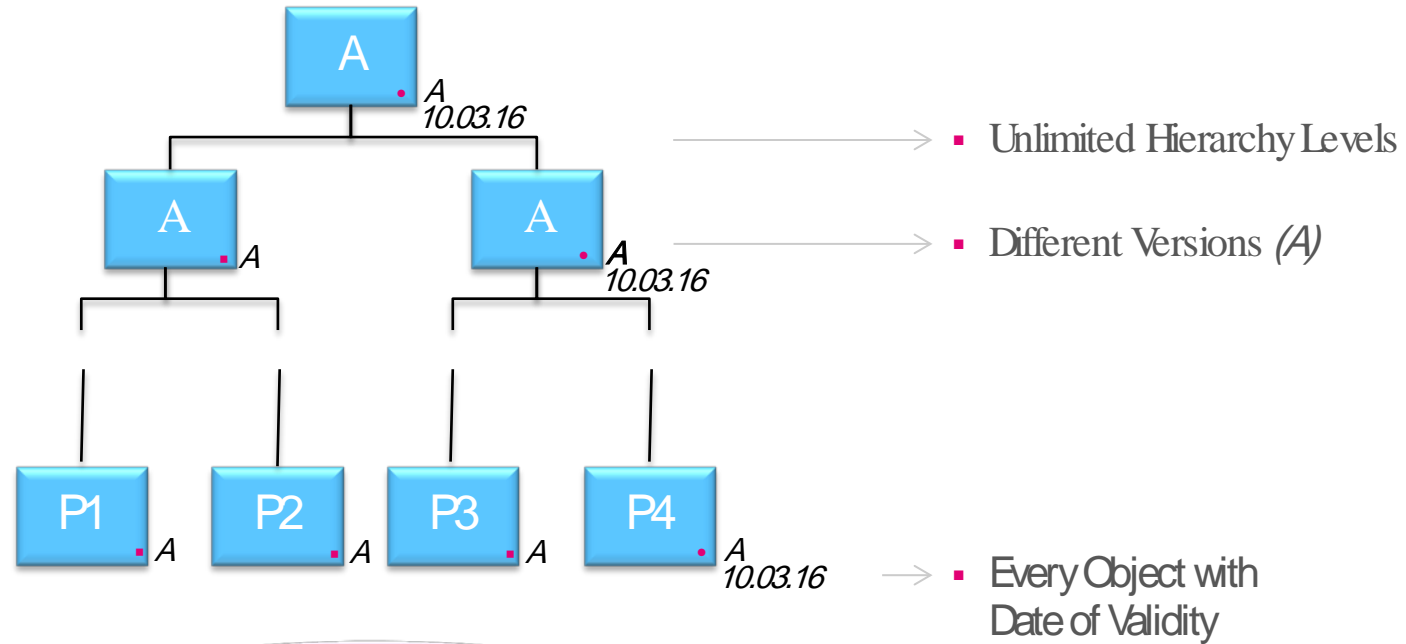


- Objects are archived as single files.
- Archived, means “sealed” with the possibilities of an archive application



Archiving of Digital 3D Assemblies Dynamic Structures @Archive (5)

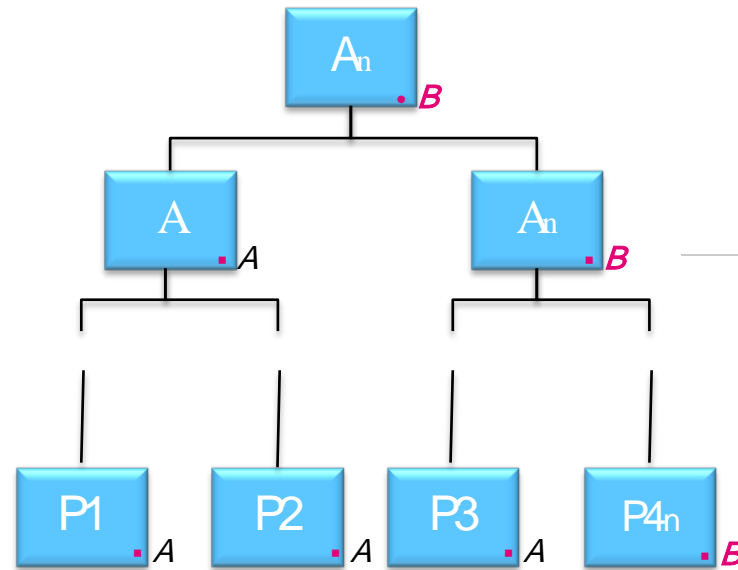
PDM Sandbox (4)



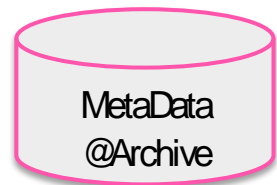
Archiving of Digital 3D Assemblies

Update of Dynamic Structures @Archive

PDM Sandbox (5)

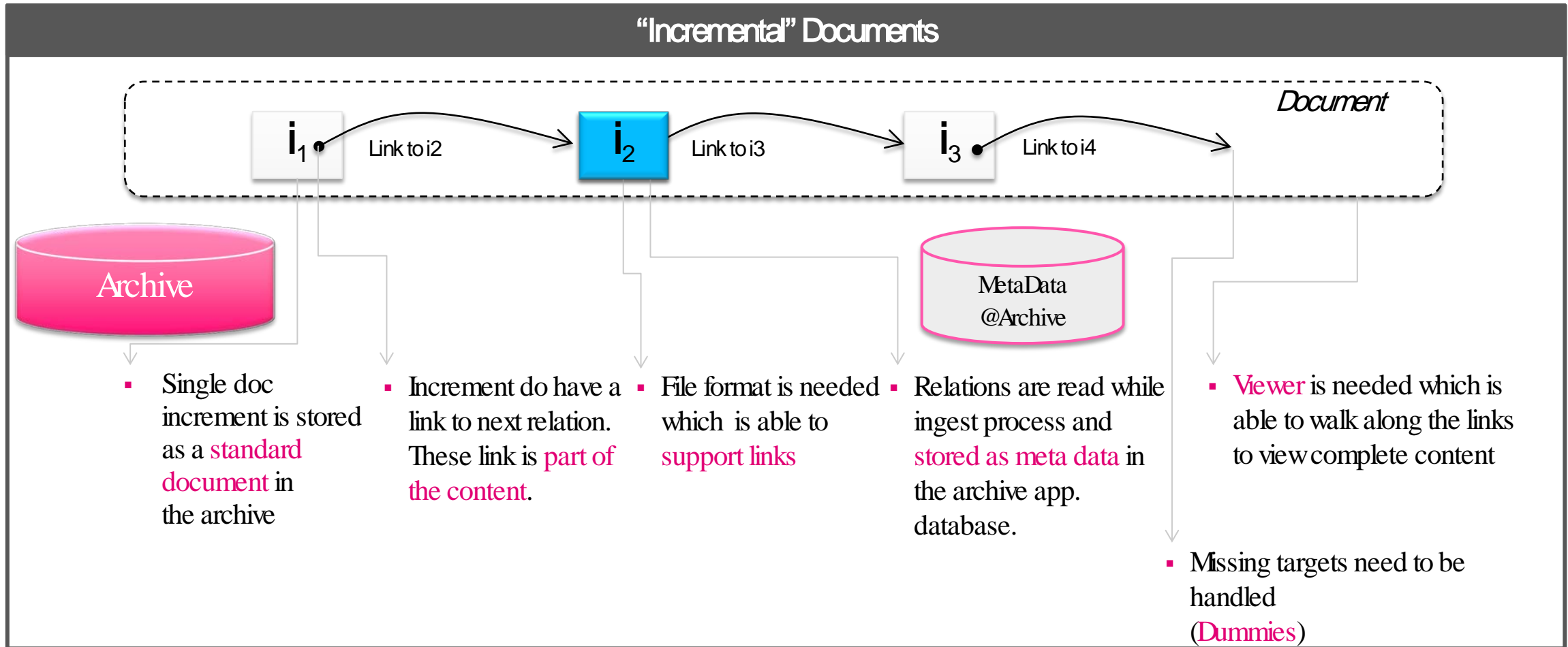


- In case of an **update** only the single assembly/ part resp. STEP-file needs to be changed and archived
- The archive system maintain and manage the update in the meta data of the archive.



Archiving of Digital 3D Assemblies

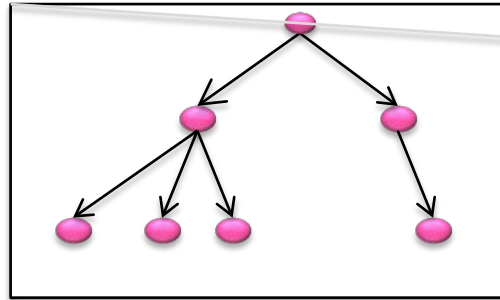
Working with Document increments



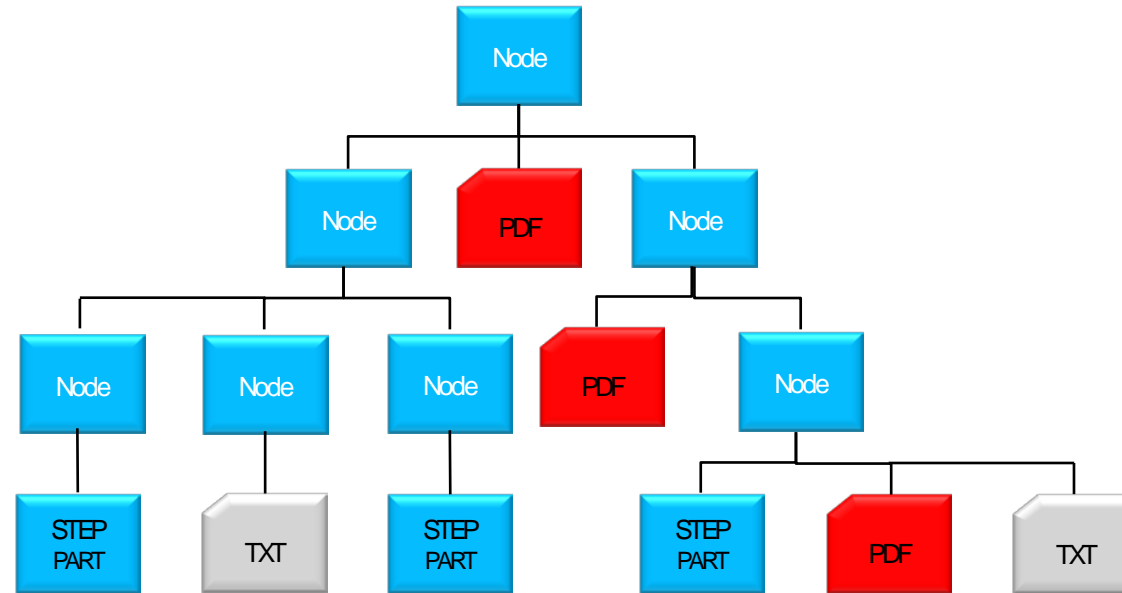
Archiving of Digital 3D Assemblies

Managing Structures

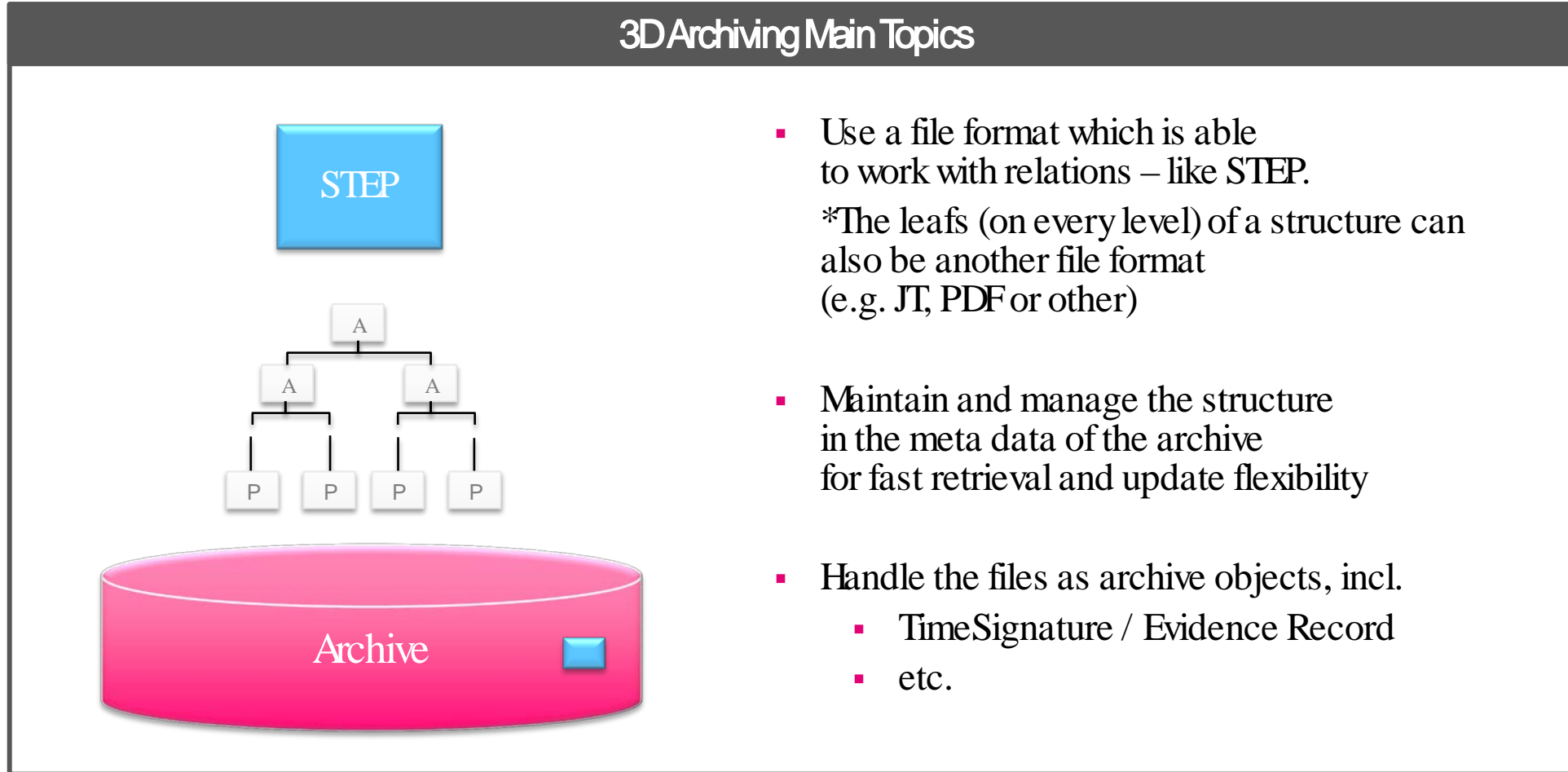
Preservation of Structures



- Any structure can be supported by links
- Logical structure becomes immutable by archived files
- Leafs can be any format
- Just nodes need to support relationships



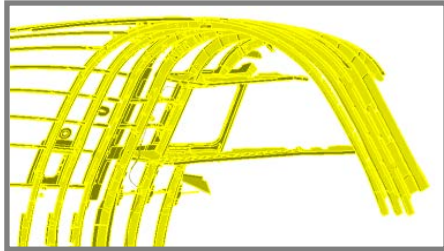
Archiving of Digital 3D Assemblies Wrap Up



See NAS/EN 9300 = LOTAR

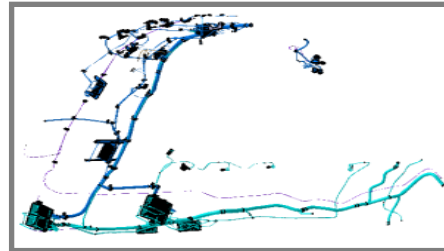
Archiving of Digital 3D Assemblies ImageMaster 3D @AIRBUS

A350 3D Electric Harness Installation Project



Context Structure

+



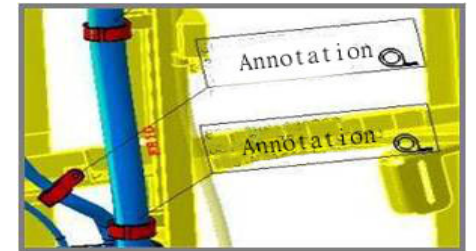
Harness Definition

+

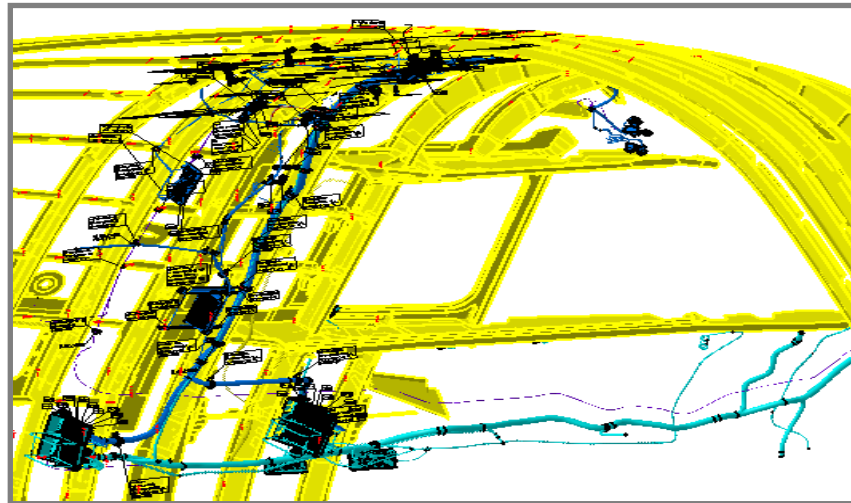


Installation DS

+



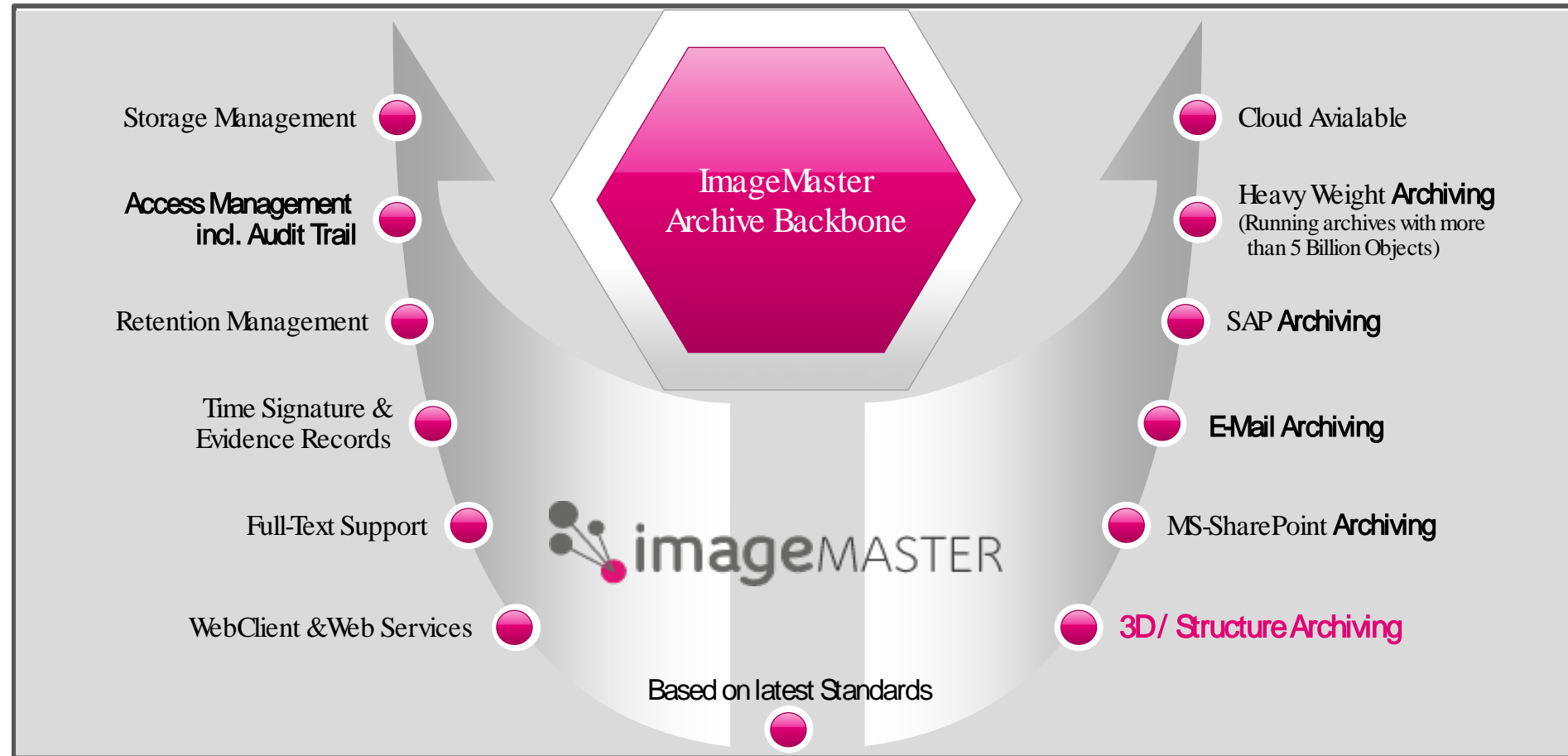
3D Annotations



In Service

- Since 2013

Archiving of Digital 3D Assemblies WITH ImageMaster®



Archiving of Digital 3D Assemblies

Application Example (1)

Hit list - Windows Internet Explorer

http://edmd075.8080/EMBREAR/createhitlist.action?imaFolderID=70&page=Hitlist.jsp&errorPage=Recherche.jsp

File Edit View Favorites Tools Help

Favorites Embracer - Login Suggested Sites

Hit list ImageMaster Standard Cli...

ImaWeb 8.9.1.1

3DTESTER1 You are here: ImaWeb client / Hit list [Help]

Folder

- 3D KPI archive
- Common search
- Drawing Sets
- Product data structure

Search

Hit list

Create document

Messages

Log out

Hits 1 - 20 of 23 from Product data structure

| 3D | Show Details | Provided | Title | State | Neutral CAD File Name | English Title | Show only last issue | Version | Part Number | Document Type | Document Owner | ATA Chapter | Category | Issue | Release Date | Business Type | Release Code | Content Information Standard |
|----|--------------|----------|-----------------|-------|-----------------------|----------------------------------|----------------------|---------|---------------|---------------|---------------------|-------------|---------------------------|-------|--------------|---------------|--------------|------------------------------|
| | | | ARR_ZYL-A | ok | ARR_ZYL.stpx | cylinder / Zylinder | | 1 | ARR_ZYL | 3D | Head of Engineering | 92 | CAD 3D Assembly Structure | A | 06/12/2012 | Assembly | 0 | STEP AP242 BO Model XML |
| | | | A5580000212_1-A | ok | A5580000212_1.jt | ZB track head AB / FUEHRUNGSKOPF | | 1 | A5580000212_1 | 3D | Head of Engineering | 92 | CAD 3D Geometry | A | 06/12/2012 | Part | 0 | JT file |
| | | | A5580000212-F | ok | A5580000212.stpx | ZB track head AB / FUEHRUNGSKOPF | | 1 | A5580000212 | 3D | Head of Engineering | 92 | CAD 3D Assembly Structure | F | 06/12/2012 | Assembly | 0 | STEP AP242 BO Model XML |
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| | | | A5580000200-D | ok | A5580000200.stpx | ZB piston rod / KOLBENSTANGE | | 1 | A5580000200 | 3D | Head of Engineering | 92 | CAD 3D Assembly Structure | D | 06/12/2012 | Assembly | 0 | STEP AP242 BO Model XML |
| | | | A5580000112_1-A | ok | A5580000112_1.jt | lip seal 24 AB / NUTRING | | 1 | A5580000112_1 | 3D | Head of Engineering | 92 | CAD 3D Geometry | A | 06/12/2012 | Part | 0 | JT file |
| | | | A5580000112-B | ok | A5580000112.stpx | lip seal 24 AB / NUTRING | | 1 | A5580000112 | 3D | Head of Engineering | 92 | CAD 3D Assembly Structure | B | 06/12/2012 | Assembly | 0 | STEP AP242 BO Model XML |
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| | | | A5580000111-B | ok | A5580000111.stpx | pin AB / ZAPFEN | | 1 | A5580000111 | 3D | Head of Engineering | 92 | CAD 3D Assembly Structure | B | 06/12/2012 | Assembly | 0 | STEP AP242 BO Model XML |
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| | | | A5580000108_1-A | ok | A5580000108_1.jt | O-seal / RUNDICHTUNG | | 1 | A5580000108_1 | 3D | Head of Engineering | 92 | CAD 3D Geometry | A | 06/12/2012 | Part | 0 | JT file |
| | | | A5580000108-B | ok | A5580000108.stpx | O-seal / RUNDICHTUNG | | 1 | A5580000108 | 3D | Head of Engineering | 92 | CAD 3D Assembly Structure | B | 06/12/2012 | Assembly | 0 | STEP AP242 BO Model XML |
| | | | A5580000107_2-A | ok | A5580000107_2.jt | track head / FUEHRUNGSKOPF | | 1 | A5580000107_2 | 3D | Head of Engineering | 92 | CAD 3D Geometry | A | 06/12/2012 | Part | 0 | JT file |
| | | | A5580000107-B | ok | A5580000107.stpx | track head / FUEHRUNGSKOPF | | 1 | A5580000107 | 3D | Head of Engineering | 92 | CAD 3D Assembly Structure | B | 06/12/2012 | Assembly | 0 | STEP AP242 BO Model XML |

Local intranet | Protected Mode: Off 110%

Archiving of Digital 3D Assemblies

Application Example (2)

Hit list - Windows Internet Explorer

http://edmd075:8080/EMBREAAR/createhitlist.action?imaFolderID=70&page=Hitlist.jsp&errorPage=Recherche.jsp

File Edit View Favorites Tools Help

Favorites Embracer - Login Suggested Sites

Hit list ImageMaster Standard Cli...

IMAWeb 8.9.1.1

3DTESTER1 You are here: ImaWeb client / Hit list [Help]

Folder

- 3D KPI archive
- Common search
- Drawing Sets
- Product data structure

Search

Hit list

Create document

Messages

Log out

Hits 1 - 20 of 23 from Product data structure

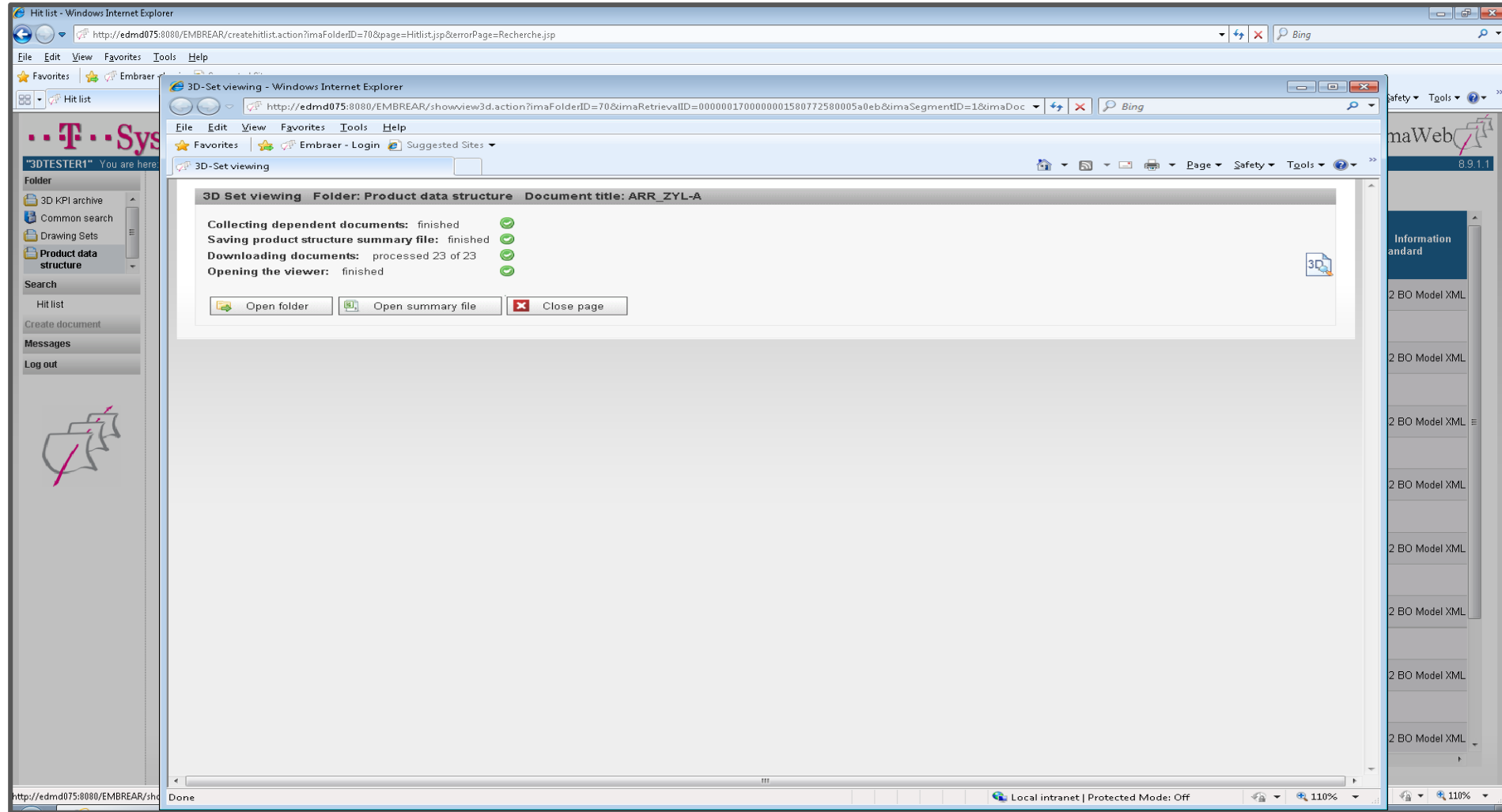
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| | | | ARR_ZYL-A | ok | ARR_ZYL.stpx | cylinder / Zylinder | | 1 | ARR_ZYL | 3D | Head of Engineering | 92 | CAD 3D Assembly Structure | A | 06/12/2012 | Assembly | 0 | STEP AP242 BO Model XML |
| <div> <div>3D Functionalities</div> <div>Document title: ARR_ZYL-A</div> <div>Retrieval in Neutral Format</div> <div>Retrieval in Target CAD Format</div> <div>Viewing</div> <div>Viewing with Signature Check</div> <div>Download</div> <div>Download with Signature Check</div> </div> | | | | | | | | | | | | | | | | | | |
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| | | | A5580000112_1 | ok | A5580000112_1.jt | lip seal 24 A8 / NUTRING | | 1 | A5580000112_1 | 3D | Head of Engineering | 92 | CAD 3D Geometry | A | 06/12/2012 | Part | 0 | JT file |
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| | | | A5580000111_1-A | ok | A5580000111_1.jt | pin A8 / ZAPFEN | | 1 | A5580000111_1 | 3D | Head of Engineering | 92 | CAD 3D Geometry | A | 06/12/2012 | Part | 0 | JT file |
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| | | | A5580000110_1-A | ok | A5580000110_1.jt | cylinder A8 / ZYLINDER | | 1 | A5580000110_1 | 3D | Head of Engineering | 92 | CAD 3D Geometry | A | 06/12/2012 | Part | 0 | JT file |
| | | | A5580000110-B | ok | A5580000110.stpx | cylinder A8 / ZYLINDER | | 1 | A5580000110 | 3D | Head of Engineering | 92 | CAD 3D Assembly Structure | B | 06/12/2012 | Assembly | 0 | STEP AP242 BO Model XML |
| | | | A5580000108_1-A | ok | A5580000108_1.jt | O-seal / RUNDDICHTUNG | | 1 | A5580000108_1 | 3D | Head of Engineering | 92 | CAD 3D Geometry | A | 06/12/2012 | Part | 0 | JT file |
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| | | | A5580000107_2-A | ok | A5580000107_2.jt | track head / FUEHRUNGSKOPF | | 1 | A5580000107_2 | 3D | Head of Engineering | 92 | CAD 3D Geometry | A | 06/12/2012 | Part | 0 | JT file |
| | | | A5580000107-B | ok | A5580000107.stpx | track head / FUEHRUNGSKOPF | | 1 | A5580000107 | 3D | Head of Engineering | 92 | CAD 3D Assembly Structure | B | 06/12/2012 | Assembly | 0 | STEP AP242 BO Model XML |

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Local intranet | Protected Mode: Off 110%

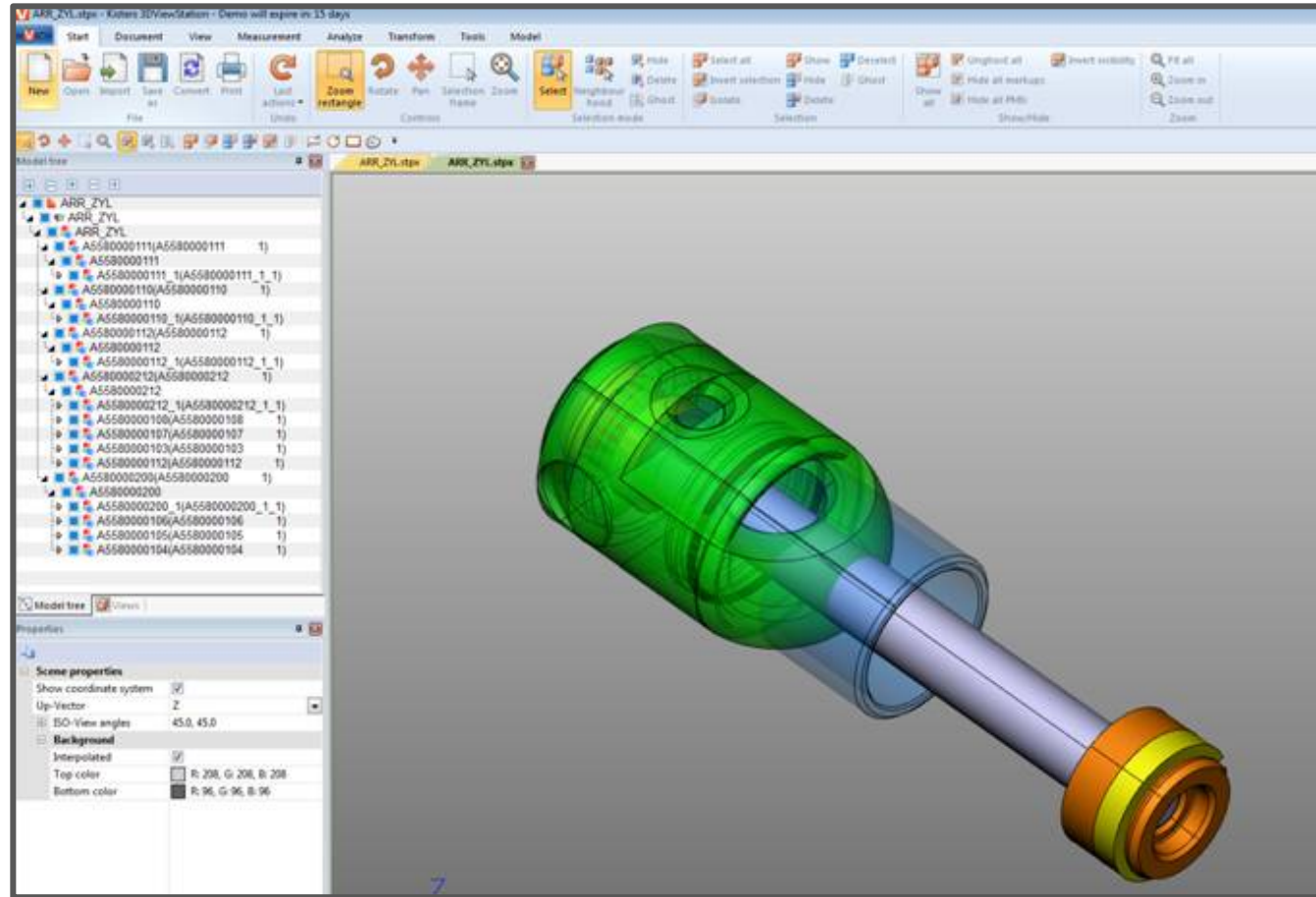
Archiving of Digital 3D Assemblies

Application Example (3)



Archiving of Digital 3D Assemblies

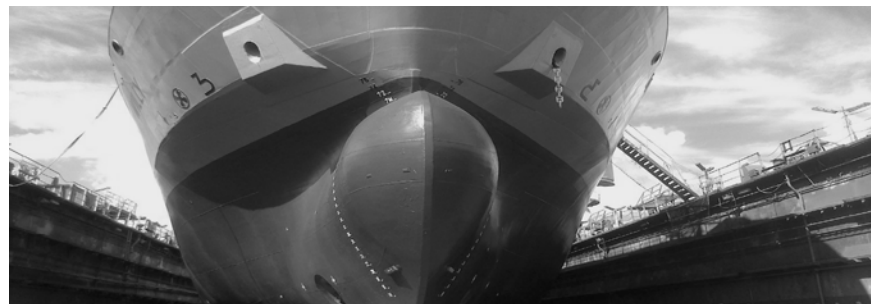
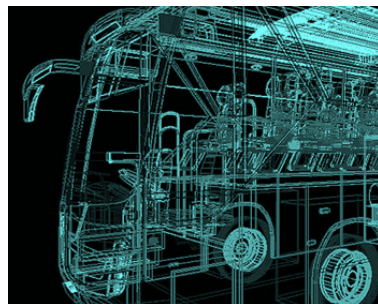
Application Example (4)



Archiving of Digital 3D Assemblies

POSSIBLE USE CASES

Airplanes ...



... and more



Thank you.

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Uwe.Helber@T-Systems.com