



Fascination with Integration

DSC Software AG

Parts management with SAP Engineering Control Center and PARTsolution from CADENAS

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DSC Software AG

DSC Software AG

Facts and figures

- Founded 1983, spin-off DSC Software AG 1998
- 150 employees
- Expertise
 - 350 SAP PLM projects
 - Manufacturing industry, aerospace & defense, automotive
 - Medicinal equipment, engineering
- Competences
 - Consultation and implementation of PLM processes and CAD integrations
 - CAD data migration
 - Integration of engineering in logistics, cooperation externs
- SAP development partner for
 - SAP Engineering Control Center
 - SAP Engineering Control Center interface to NX
- Strong partnerships



Selected references

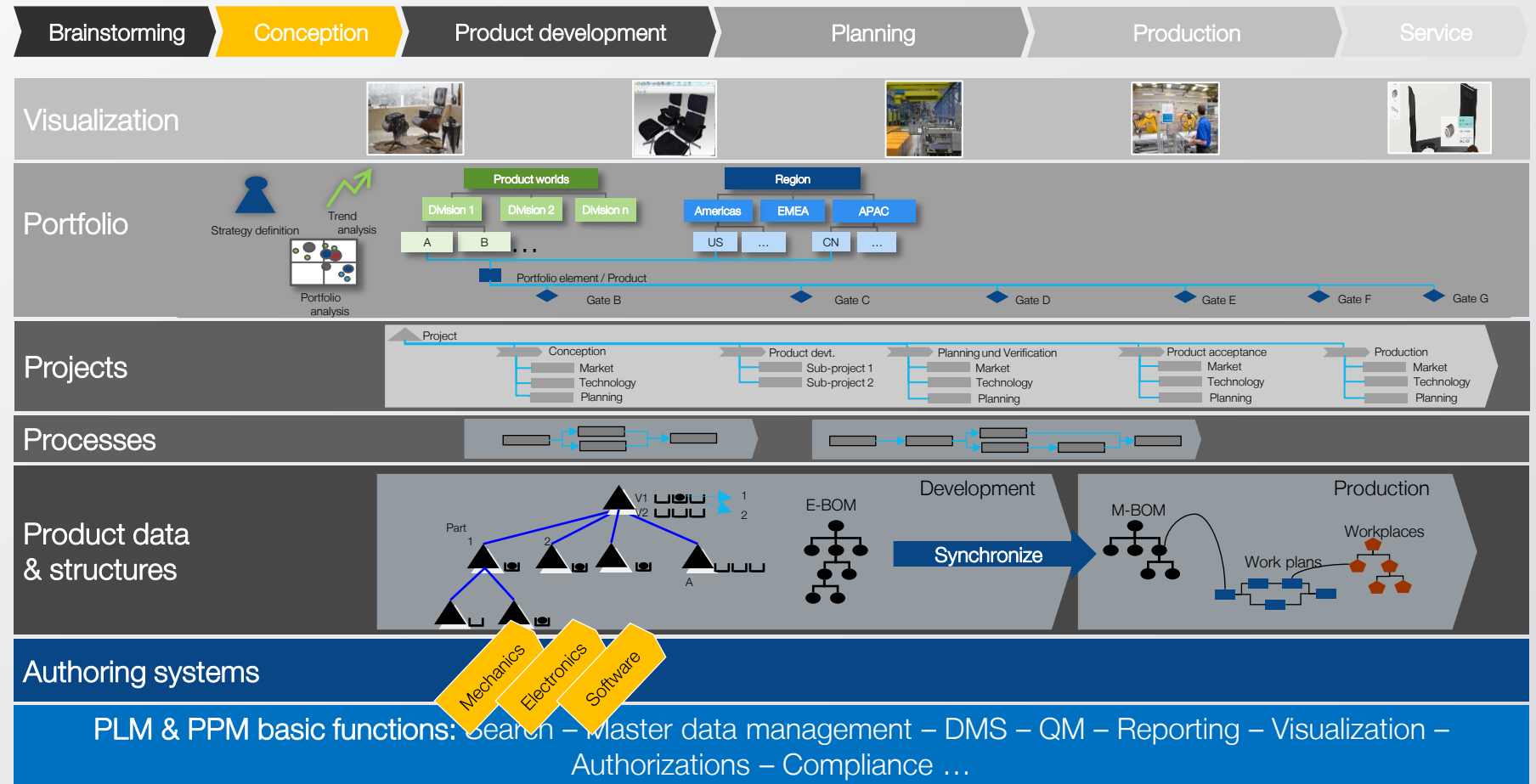
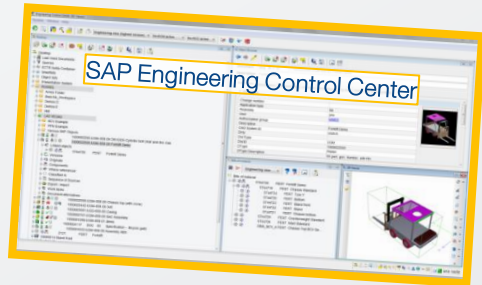


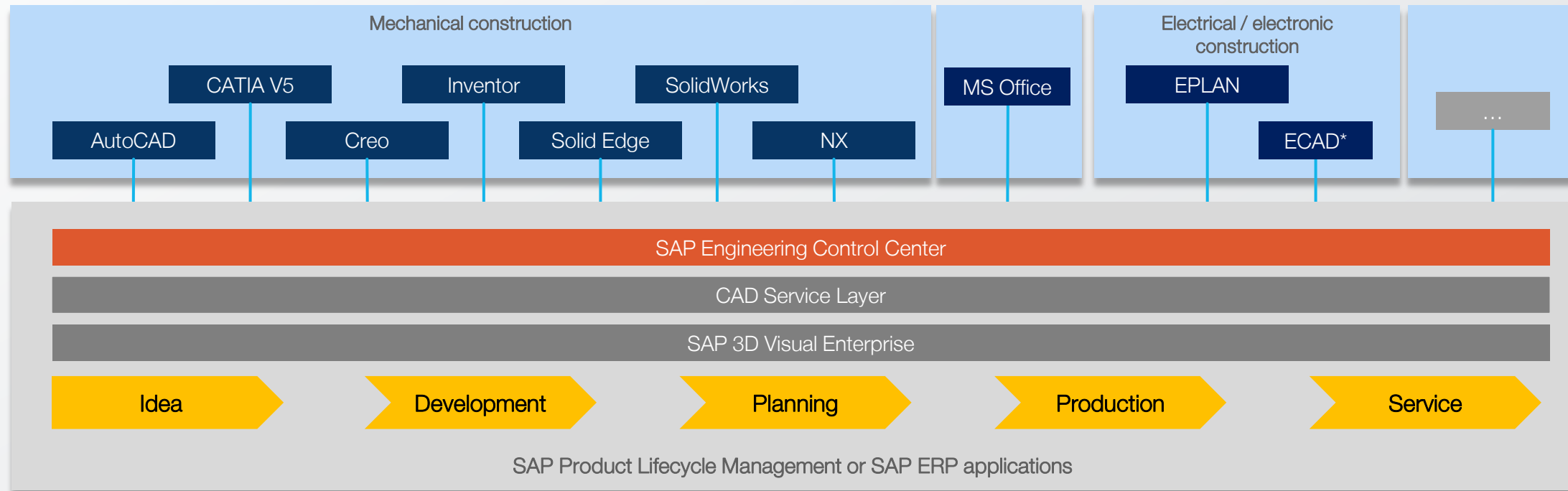


SAP Engineering Control Center

Solutions for product development – “Our guiding principle”



Integrating product life phases, processes, product data and systems optimally



ECAD*

Currently available: Integration of Altium Designer, CADENCE Allegro, CADENCE OrCAD, Mentor DX/Expedition,...

Possible future standard integrations

Available since July 2016 also for

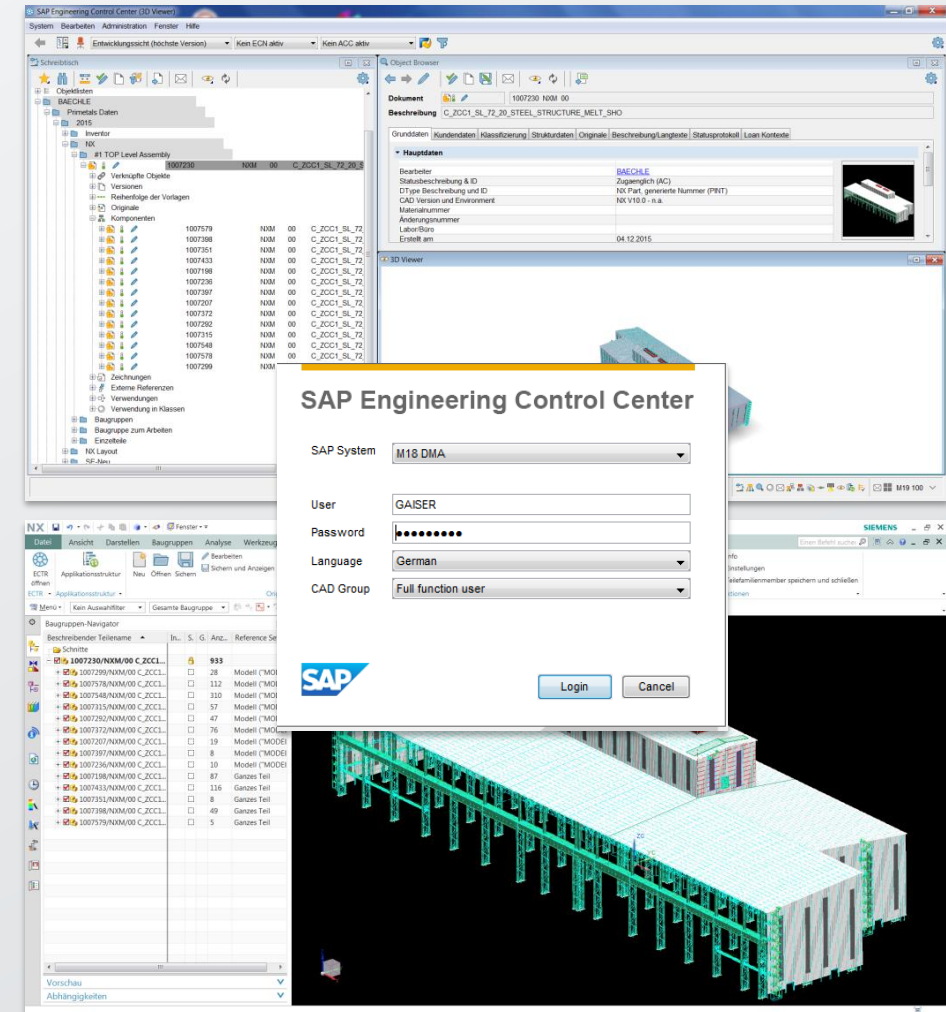
SAP S/4 HANA



SAP Engineering Control Center

Cockpit for Technical Information and Processes in SAP

- **Comprehensive Integration Platform**
Consistent integration of authoring systems along the value chain, e.g. MCAD, ECAD, Office, e-mail, software, ...
- **360° product view** including mechanics, electronics, software, simulation etc.
- **Ideal user interface for authors**
Easy and intuitive utilization of rich SAP data
- **ONE integrated system for PLM and ERP**
Efficient working environment
Automated workflows and processes
Consistent engineering processes and logistics processes



SAP Engineering Control Center

SAP for Engineering

The screenshot displays the SAP Engineering Control Center (Baugruppen) interface. The main window shows a 3D model of a pump assembly in orange. The left sidebar contains the 'Assembly Navigator' with a list of components. The right sidebar shows the 'Object Browser' with a table of components and their properties.

Assembly Navigator (Left Sidebar):

- Descriptive Part Name
- Sections
- 1012741/NXM/00 Pumpe (Order: Chronological)
 - Component Patterns
 - 1012721/NXM/00 0000669391_0
 - 1012727/NXM/00 0000050306_0
 - 1012730/NXM/00 Stuetzschelbe
 - 1012743/NXM/00 0000055810_0
 - 1012751/NXM/00 0000055914_0
 - 1012723/NXM/00 Gleitring Dichtung Burgmann M37756-20R
 - 1012722/NXM/00 Passfeder A 6x36 DIN6885 9x50-1k
 - 1012740/NXM/00 0000055314_0
 - 1012725/NXM/00 Zylinderschraube M10x25 DIN6912 8.8 x 4
 - 1012746/NXM/00 Gehaeuseeinsatz
 - 1012748/NXM/00 0000020134_0
 - 1012742/NXM/00 0000047091_0
 - 1012730/NXM/00 Federteiler
 - 1012749/NXM/00 Ventilkugel
 - 1012726/NXM/00 0000038061_0
 - 1012732/NXM/00 0000027971_0
 - 1012738/NXM/00 Leistungsschraube M10x25 DIN6912 8.8 x 4
 - 1012744/NXM/00 0000054318_0
 - 1012745/NXM/00 0000043927_0 x 4
 - 1012736/NXM/00 Dichtung A 14x18 DIN7603-AI x 2
 - 1012728/NXM/00 Verschlusschraube x 2
 - 1012739/NXM/00 0000037350_0
 - 1012735/NXM/00 0000037349_0
 - 1012752/NXM/00 0000055114_0
 - 1012750/NXM/00 Flachdichtung
 - 1012737/NXM/00 0000050213_0 x 2

Object Browser (Right Sidebar):

Grunddaten	Kundendaten	Klassifizierung	Strukturdaten	Originale	Beschreibung/Langtexte	Statusprotokoll	Loan Kontexte
Beschreibung	Gehäuse						
Dokumentnummer	1012740						
Teildokument	000						
Version	00						
Dokumentart	NXM						
Statusbeschreibung & ID	Zugänglich (AC)						
D-Type Beschreibung und ID	NX Part, generierte Nummer (PINT)						
Materialnummer	302538						
Erstellt am	07.09.2016						
Zuletzt gespeichert	08.09.2016 10:06:40						
Änderungsnummer							
Gültig ab (UTC)							

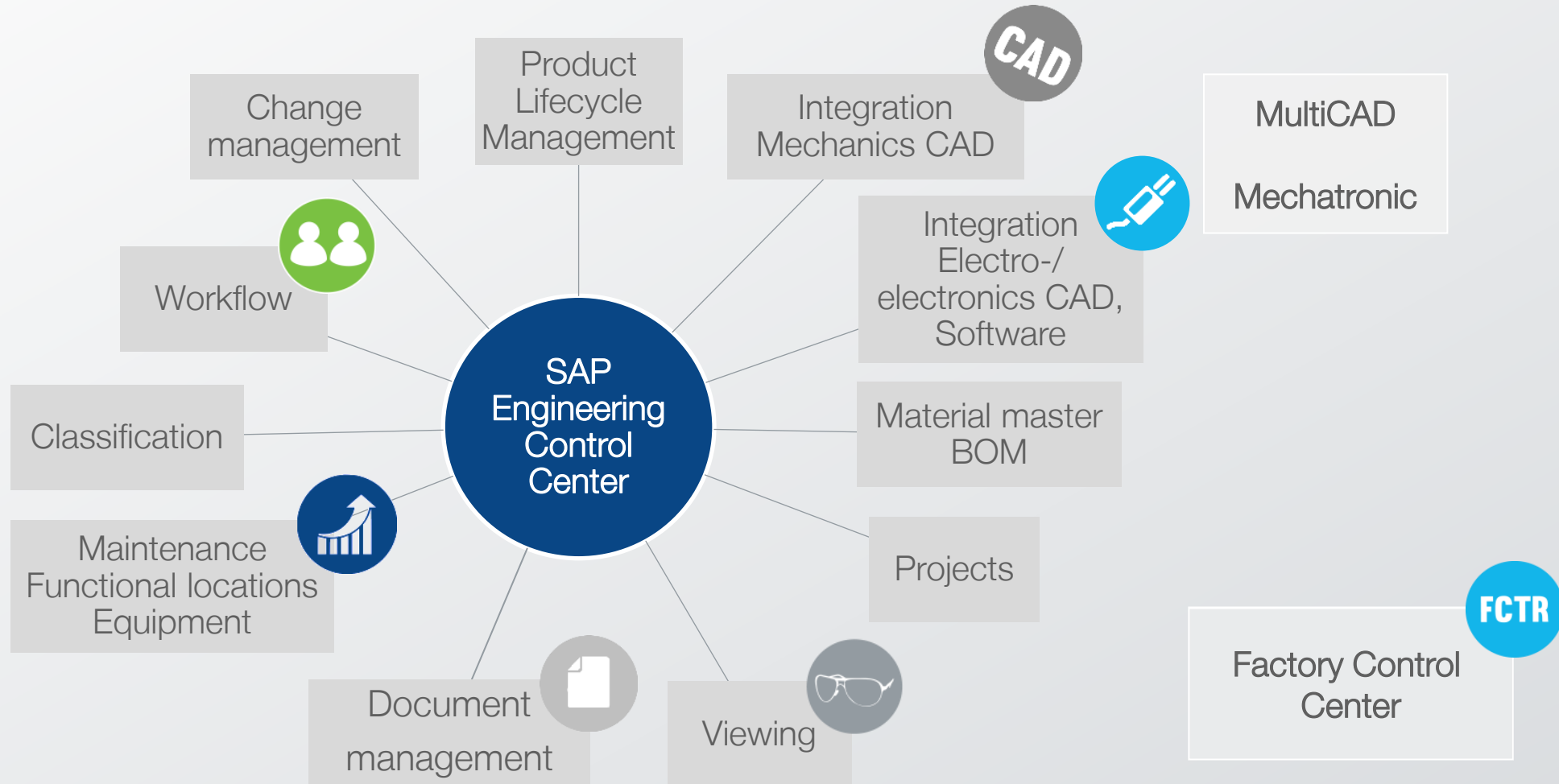
Baugruppen (Bottom Panel):

Materialnummer	Materialname	Materialart	Materialstatus	Materialtyp	Materialgruppe	Materialbeschreibung	Materialmenge	Materialkosten	Materialwert
1012736	NXM 00	00	00	00	00	Dichtung A 14x18 DIN7603-AI	AC 2		
1012730	NXM 00	00	00	00	00	Federteiler	AC 1		
1012750	NXM 00	00	00	00	00	Flachdichtung	AC 1		
1012746	NXM 00	00	00	00	00	Gehaeuseeinsatz	AC 1		
1012723	NXM 00	00	00	00	00	Gleitring Dichtung Burgmann M37756-20R	AC 1		
1012738	NXM 00	00	00	00	00	Leistungsschraube D26x52	AC 1		
1012722	NXM 00	00	00	00	00	Passfeder A 6x36 DIN6885 9x50-1k	AC 1		
1012720	NXM 00	00	00	00	00	Stuetzschelbe	AC 1		
1012749	NXM 00	00	00	00	00	Ventilkugel	AC 1		
1012728	NXM 00	00	00	00	00	Verschusschraube	AC 2		
1012725	NXM 00	00	00	00	00	Zylinderschraube M10x25 DIN6912 8.8	AC 4		
1012737	NXM 00	00	00	00	00	0000050213_0	AC 2		
1012724	NXM 00	00	00	00	00	0000050213_0	AC 1		
1012740	NXM 00	00	00	00	00	Gehäuse	AC 1		
1012734	NXM 00	00	00	00	00	0000055314_0	AC 1		
1012721	NXM 00	00	00	00	00	0000669391_0	AC 1		
1012729	NXM 00	00	00	00	00	0000037264_0	AC 1		
1012747	NXM 00	00	00	00	00	0000629053_0	AC 1		
1012753	NXM 00	00	00	00	00	0000662200_0	AC 1		



What can SAP Engineering Control Center do?

Integration platform and cockpit for technical information and processes in the SAP system



Parts management with SAP

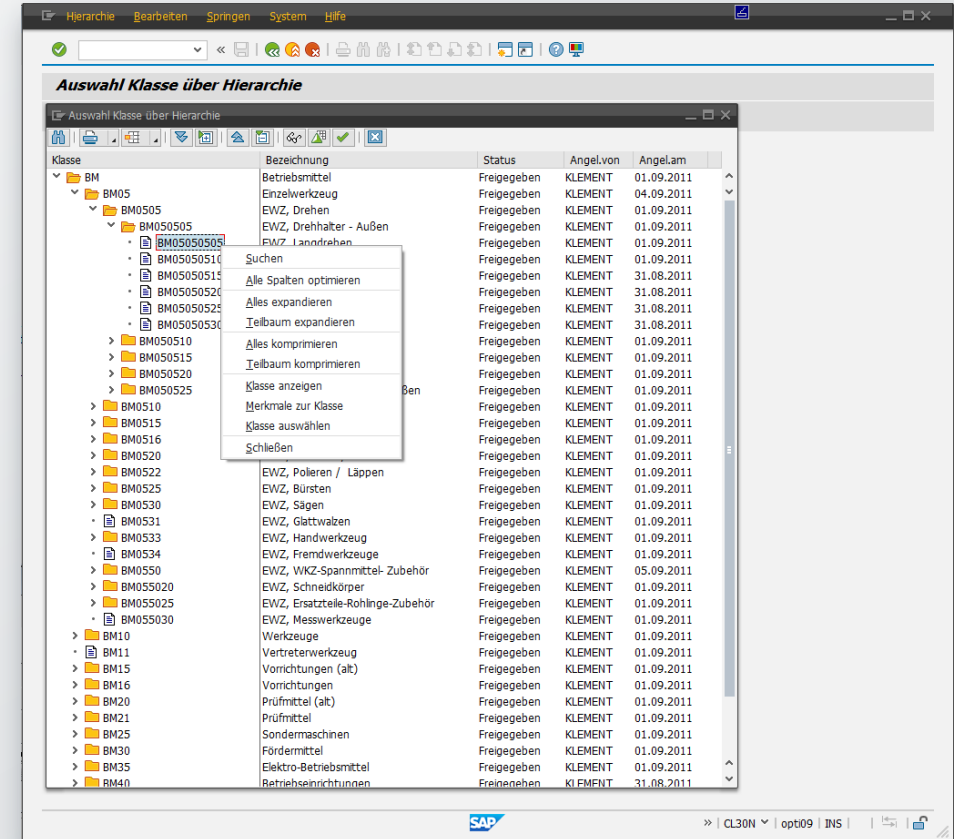
What do designers want?

- Access to current 3D models from different manufacturers (standard and catalog parts), conform to the company's own CAD methods
- Finding (instead of looking for) suitable parts and solutions
- High-performance user interface – current technical and commercial information at a glance:
 - CAD information (geometry, weight,...)
 - ERP information (preferred parts, availability,..)
 - Can the part be replaced by a similar one?
 - What parts must not be used?
 - What parts are the best-priced?
 - What parts are in stock / on hand?
- Simple classification of own parts – preferably automatic



Why parts management in SAP?

- SAP – ONE system for the company-wide management of master data
- Management of parts AND product-related documents
- ONE classification system for the organization and re-use of information:
 - Graphical search of objects by the SAP class search
 - Search by characteristics / functions
 - Full-text search
 - Search by linked objects
 - Search by part usage
- Linkage of documents provides information



Retrieve and reuse parts

Example: Retrieve standard parts / catalog parts or individual parts by using the SAP material classification

The image displays three overlapping screenshots of the SAP material classification interface, illustrating the process of retrieving standard parts.

Top Left Screenshot: Shows the 'Klassifizierung' (Classification) window. The 'Verbindungselemente' (Connection Elements) tree is expanded, and 'Schrauben' (Screws) is selected. The 'Schrauben (0_1100) - 001' window is open, showing a list of screw types: Senkkopfschrauben, Sechskantschrauben, Zylinderschrauben, and Gewindeschrauben.

Bottom Left Screenshot: Shows the 'Klassifizierung' window with 'Sechskantschrauben' (Hex Head Screws) selected. The 'Sechskantschrauben (0_1120) - 001' window is open, showing a list of hex head screw types: DIN 931, DIN 933/ISO 4017, and DIN 6914.

Right Screenshot: Shows the 'Object Browser' window with 'Sechskantschrauben' selected. The 'Klassifizierte Objekte' (Classified Objects) tab is active, displaying a list of materials. The list includes columns for Material, Kurztext, Bezeichnung, Gewindelänge (b), Gewindesteigung (P), Kopfhöhe (k), and Net. The list is filtered to show 218 results.

Table Data (from right screenshot):

Material	Kurztext	Bezeichnung	Gewindelänge (b)	Gewindesteigung (P)	Kopfhöhe (k)	Net
855	FERT SK-Schraube M3x6 DIN933-8.8	M3	0,5 mm	2,0 mm	6,0	
856	FERT SK-Schraube M4x10 DIN933 hitzebestä..	M4	0,7 mm	2,8 mm	10	
857	FERT SK-Schraube M4x12 DIN933-8.8	M4	0,7 mm	2,8 mm	12	
858	FERT SK-Schraube M4x30 DIN933 A2	M4	0,7 mm	2,8 mm	30	
859	FERT SK-Schraube M4x30 DIN933-MS	M4	0,7 mm	2,8 mm	30	
870	FERT SK-Schraube M5x16 DIN933-8.8	M5	0,8 mm	3,5 mm	16	
871	FERT SK-Schraube M5x20 DIN933 A2	M5	0,8 mm	3,5 mm	20	
872	FERT SK-Schraube M5x20 DIN933-8.8	M5	0,8 mm	3,5 mm	20	
873	FERT SK-Schraube M5x25 DIN933 A2	M5	0,8 mm	3,5 mm	25	
874	FERT SK-Schraube M5x25 DIN933-8.8	M5	0,8 mm	3,5 mm	25	
875	FERT SK-Schraube M5x30 DIN933 A2	M5	0,8 mm	3,5 mm	30	
876	FERT SK-Schraube M5x30 DIN933-8.8	M5	0,8 mm	3,5 mm	30	

- Hierarchical and graphical search
- Result lists that can be filtered
- Open linked documents in CAD



Retrieve and reuse parts

Example: find tool assemblies using SAP material classifications

The screenshot displays the SAP Engineering Control Center 5.0 (Klassifizierung) interface. The main window is titled 'SAP Engineering Control Center 5.0 (Klassifizierung)' and shows a 3D model of a tool assembly in the center. The interface is divided into several panes:

- Object Browser:** Shows the hierarchy of the tool assembly, including 'Klasse' (T100001) and 'Beschreibung' (Gewindebohrer).
- Navigator:** Displays a list of objects, including 'GewBhr.mit abgesetztem Schaft', 'GewBhr.mit verstärktem Schaft', 'GewFrh.mit abgesetztem Schaft', 'GewFrh.mit verstärktem Schaft', and 'Schneideisen.rund'.
- 3D Viewer:** Shows a 3D model of the tool assembly.
- Klassifizierung:** Shows a list of materials and their classifications. The table below is a representation of the data shown in the screenshot.

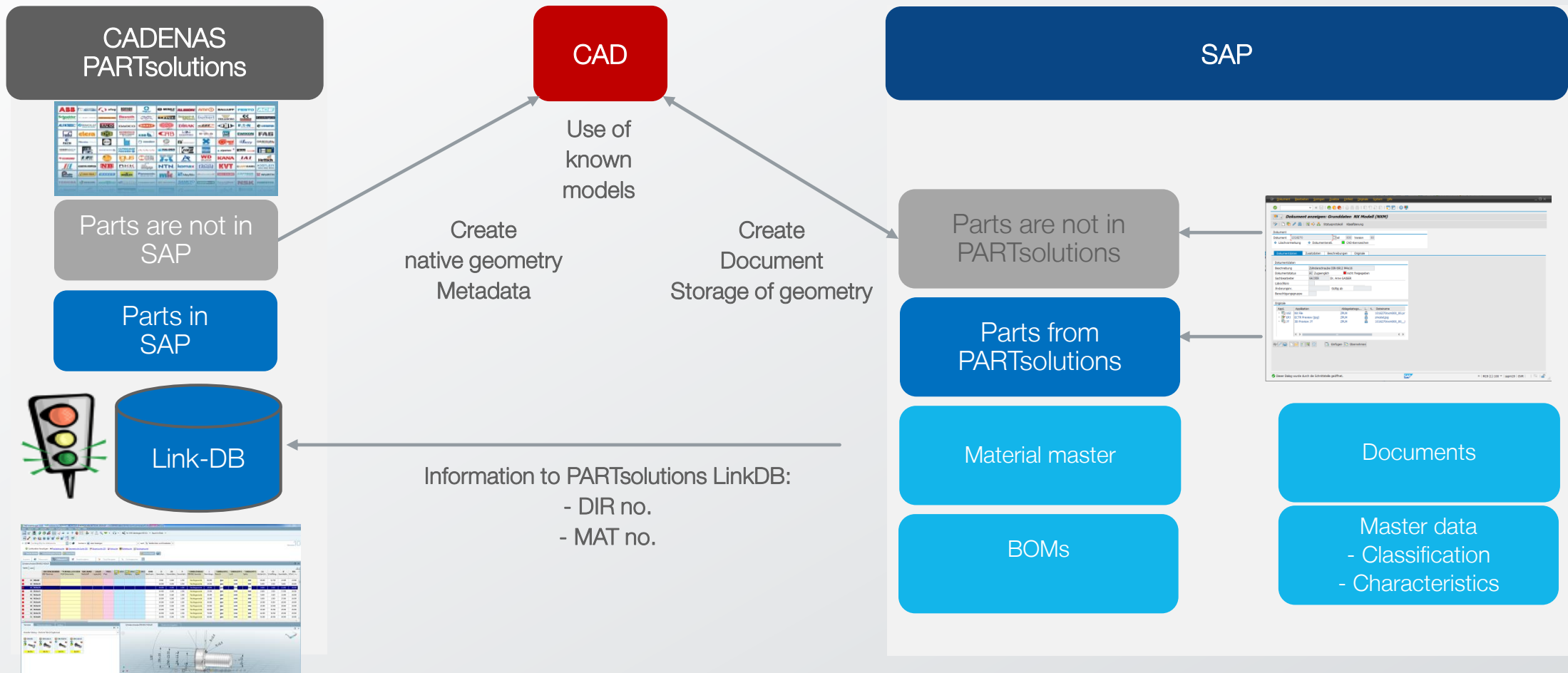
Material	Materialkurztext	Material	Materialkurztext
5744545	FHMI	5744545	FHMI
5744551	FHMI	5744551	FHMI
5744553	FHMI	5744553	FHMI
5744554	FHMI	5744554	FHMI
5744555	FHMI	5744555	FHMI
5744556	FHMI	5744556	FHMI
5744557	FHMI	5744557	FHMI
5744571	FHMI	5744571	FHMI
5745024	FHMI	5745024	FHMI
5745034	FHMI	5745034	FHMI
5745113	FHMI	5745113	FHMI

The bottom pane shows a detailed view of the 'GewBhr.mit abgesetztem Schaft (T10000101) - 001' material, including its classification and a table of materials.



Interaction between CADENAS PARTsolutions, CAD and SAP

Interaction between CADENAS PARTsolutions, CAD and SAP



CADENAS PARTsolutions

Business data and technical data in one user interface

The screenshot displays the CADENAS PARTsolutions 10.00 interface. The top menu bar includes Datei, Export, ERP, Ansicht, Tabelle, Konfigurator, Extras, Fenster, and Hilfe. Below the menu is a toolbar with various icons for file operations and data management. The main window is divided into several sections:

- Search Bar:** Located at the top left, it includes a search input field with the text "Suchbegriff(e) für Volltextsuche" and a dropdown menu for "Suchen in" (Search in) with options like "allen Katalogen" (all catalogs) and "nach" (by) "Teilfamilien und Einzelteilen" (part families and individual parts).
- Search Functions:** A row of buttons for "Suchfunktion hinzufügen:" (Add search function) including "Variablenuche" (Variable search), "Geometrische Suche (3D)" (Geometric search (3D)), "Skizzenuche (2D)" (Sketch search (2D)), "Farbsuche" (Color search), "Rohteilsuche" (Raw part search), and "Topologiesuche" (Topology search).
- Assistent (Assistant):** A row of buttons for "Teileauswahl" (Part selection), "Teileansicht" (Part view), "Bauteilvergleich" (Part comparison), and "Cloud Navigator".
- Table:** A large table displaying technical data for screws. The table has columns for ERP-PDM_NUMBER, PLMTABLE_DOCVIEW, MAT_NAME, LAGER, PRICE, SAP, LOC1, LOC2, LOC3, IDNR, D, D3, P, *DIN962THREAD, L, *DIN962CLASS, *DIN962OPT1, *DIN962OPT2, *DIN962OPT3, B, LS, and LG. The table lists various screw specifications, including M16x80, M16x90, M16x100, M16x110, M16x120, M16x130, M16x140, M16x150, M16x160, and M20x30.
- Similar Parts:** A section on the left side of the table showing "Ähnliche Teile (7 Ergebnisse)" (Similar parts (7 results)). It displays seven screw models with their respective similarity percentages: DIN 7500-... (96.5%), DIN 7964 ... (94.4%), DIN 34823 (94.0%), DIN 7964 ... (93.8%), DIN 7964 ... (93.7%), DIN 601 (93.2%), and DIN 604 (93.2%).
- 3D Model:** A 3D model of a screw is shown in the bottom right corner, with a blue callout box indicating "Data for 2D and 3D CAD".

Blue callout boxes highlight key features:

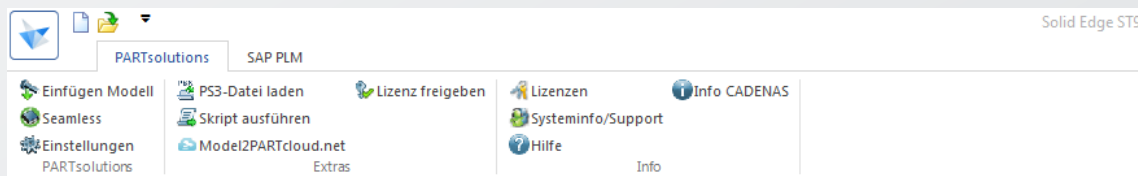
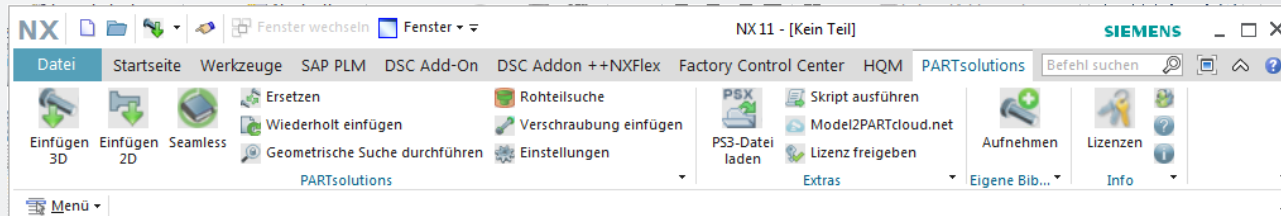
- Up-to-date SAP data of the part:** Located in the top right area of the interface.
- Display of class structures:** Located in the middle left area, pointing to the table.
- Search in characteristics:** Located in the middle right area, pointing to the table.
- SimilarParts:** Located in the bottom left area, pointing to the similar parts section.
- Data for 2D and 3D CAD:** Located in the bottom right area, pointing to the 3D model.



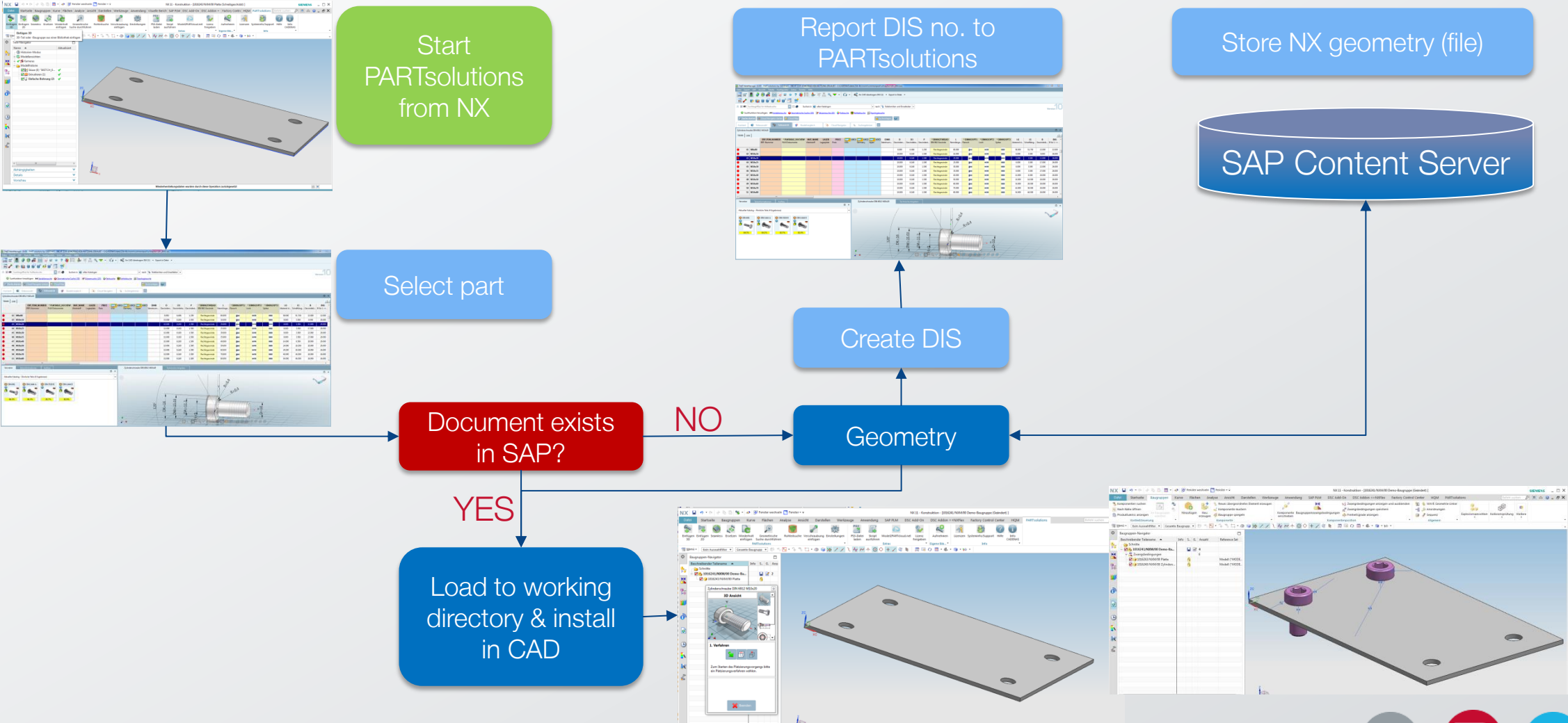
Management of standard and purchased parts in SAP?

CADENAS PARTsolutions supplements the existing PLM process:

- Access to standard part catalogs and to more than 600 manufacturers' catalogs. Updates are made by the manufacturers.
- Create standard parts, purchased parts and repeat parts from PARTsolutions as CAD parts and store them in SAP
- Manage SAP information (mat. status) in PARTsolutions
- Conduct search for parts from CAD using ++partSolutionsNX, e.g. by geometric similarity search



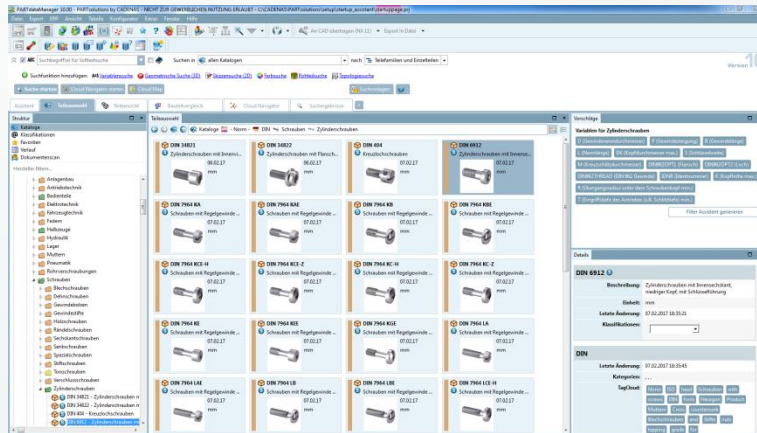
Finding and (re)using parts



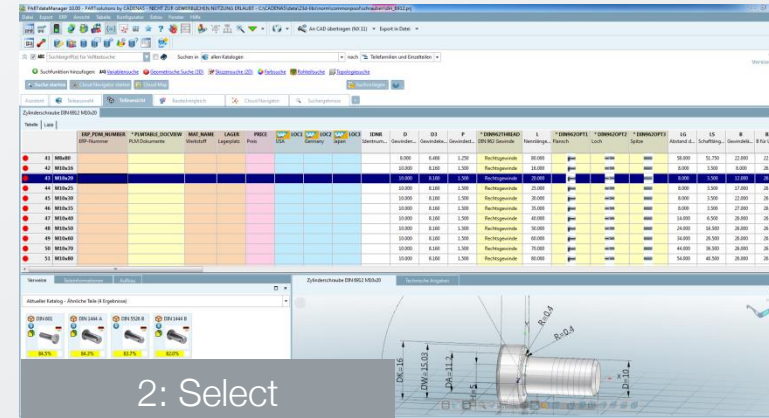
New parts creation process

New parts creation process

Find a part in CADENAS PARTsolutions and create a new part in SAP



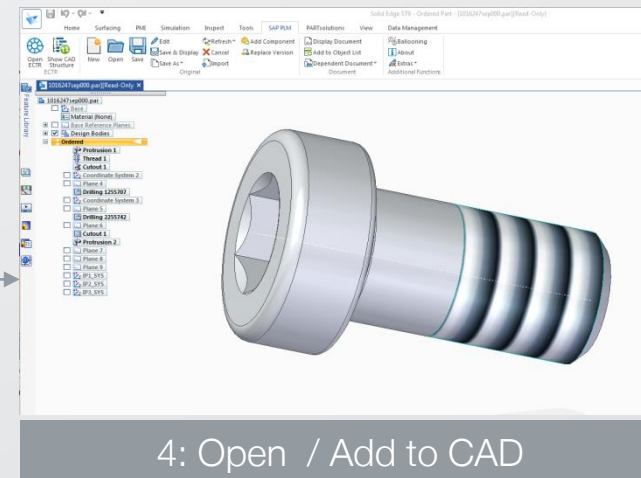
1: Search



2: Select

3. Process starts automatically:

- Create DIR in SAP
- Create NX geometry
- Store NX document in Content Server
- Provide document in NX
- Enter Doc-ID in Linkdb

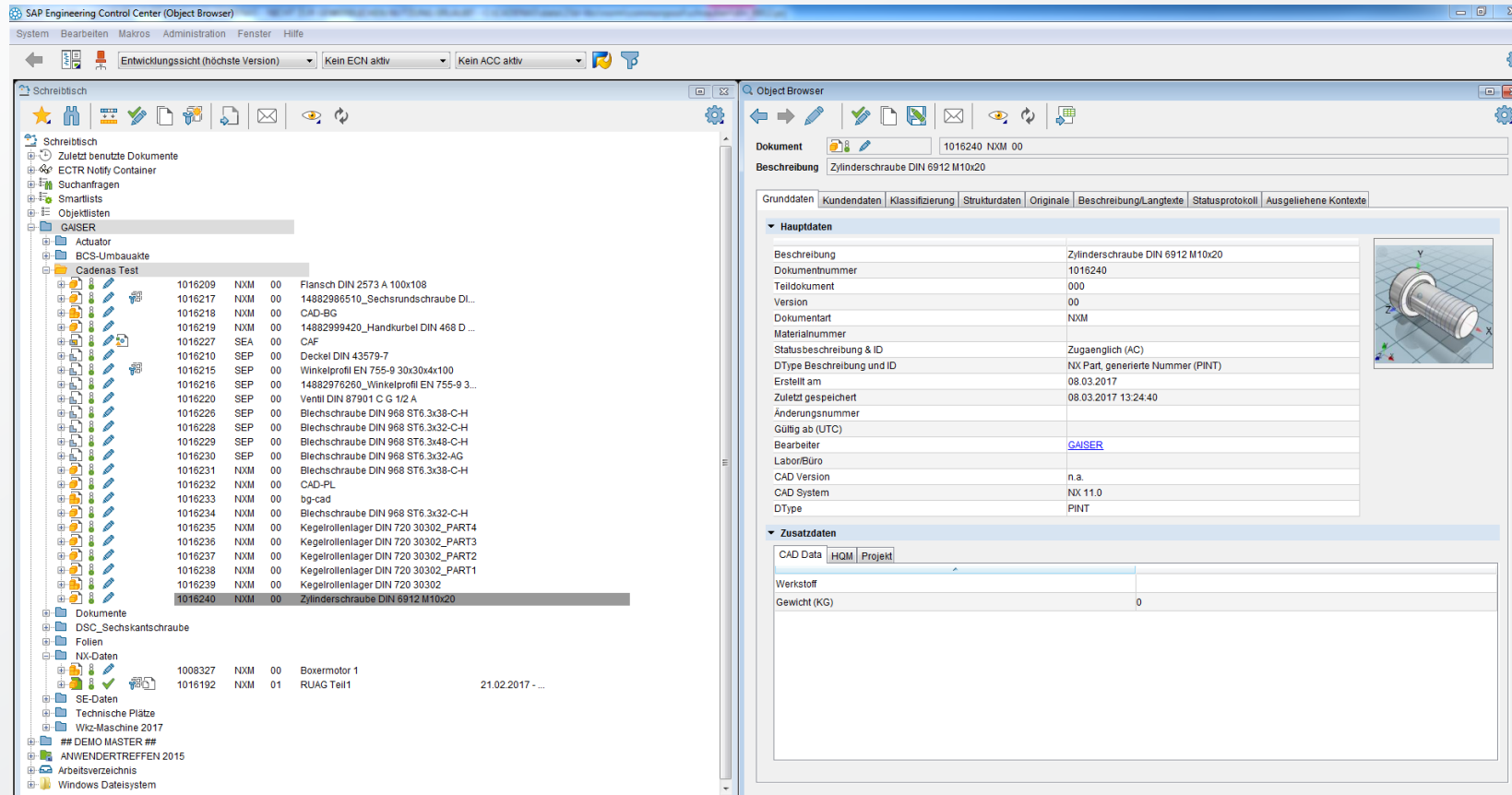


4: Open / Add to CAD



Managing parts in SAP

Parts created with CADENAS are managed in SAP as documents



- Store as document
- Different document types for each CAD system
- Link with material possible
- Classification of document and / or material



Scope of ++PARTsolutions

- OPTIONAL: Creation of a material master in SAP during the creation of a new part from PARTsolutions and link with the document info record of the part. The SAP document key and the SAP material key are automatically entered in the LinkDB of CADENAS PARTsolutions.
- If an automatic material master creation process is implemented in SAP, PARTsolutions metadata from the document properties is also mapped to fields of the SAP material master.
- If the material master is later linked with a document info record, a cyclic comparison of data between the LinkDB and SAP can be set up.
- In PARTsolutions, roles, views, and rights can be configured. For example, a “traffic-light signal” can be configured. Green-highlighted parts are preferred, or red-highlighted parts must no longer be used.
- PARTsolutions enables you to use further columns to display information from SAP in the user interface of CADENAS PARTsolutions.



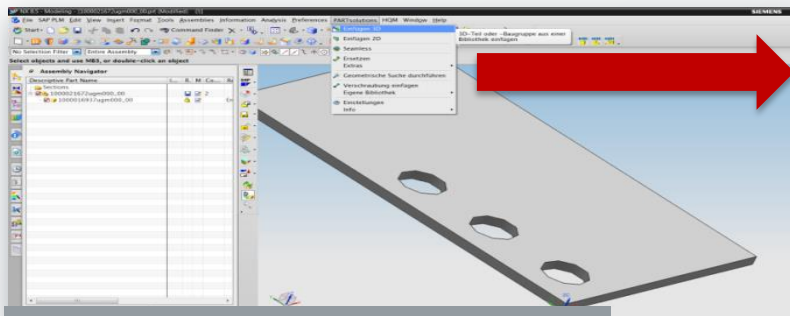
Reusing components

Finding and reusing

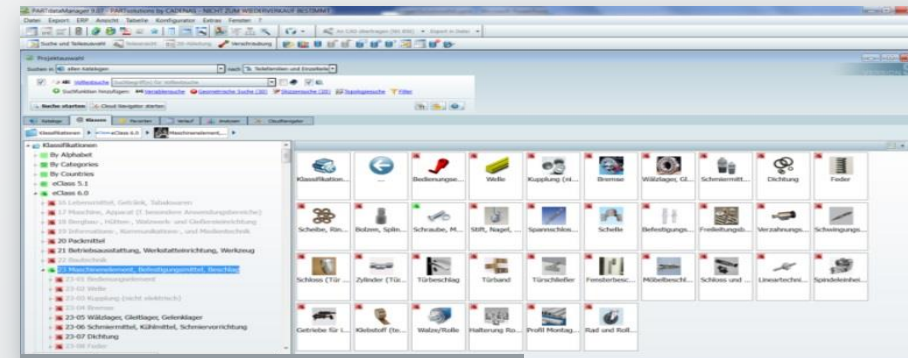
existing standard and catalog parts

Find a part in CADENAS PARTsolutions and open / use it in NX

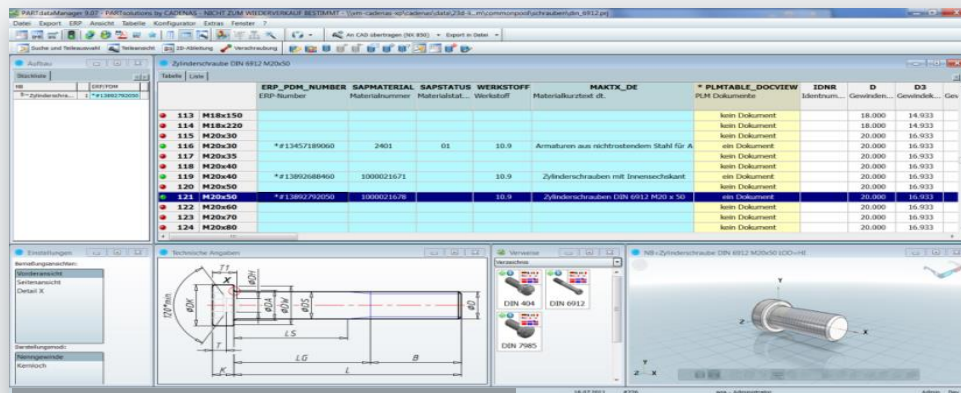
Process sequence



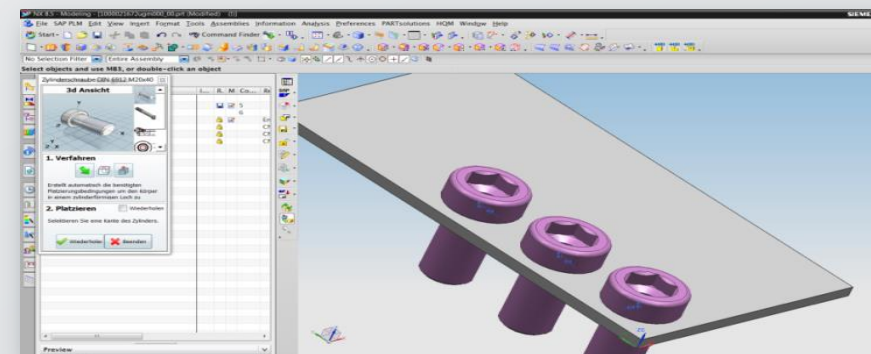
1: Start PARTSolution



2: Search



3: Select

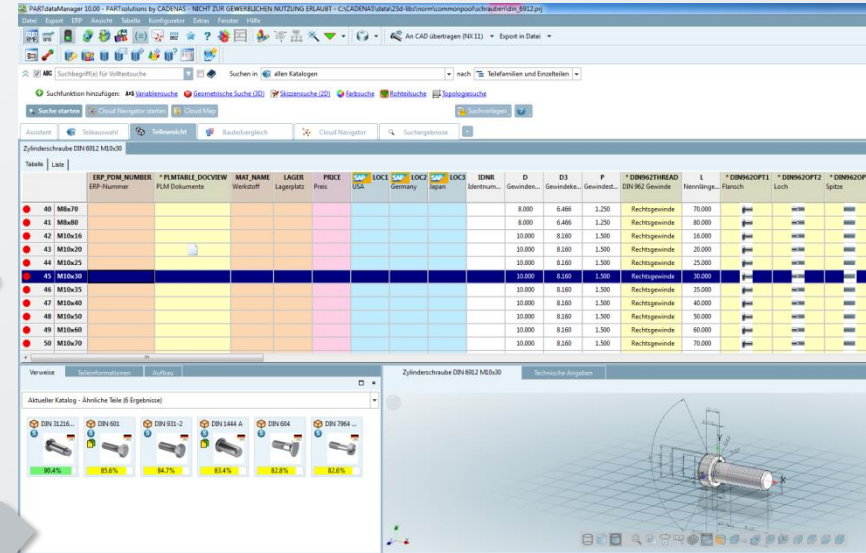
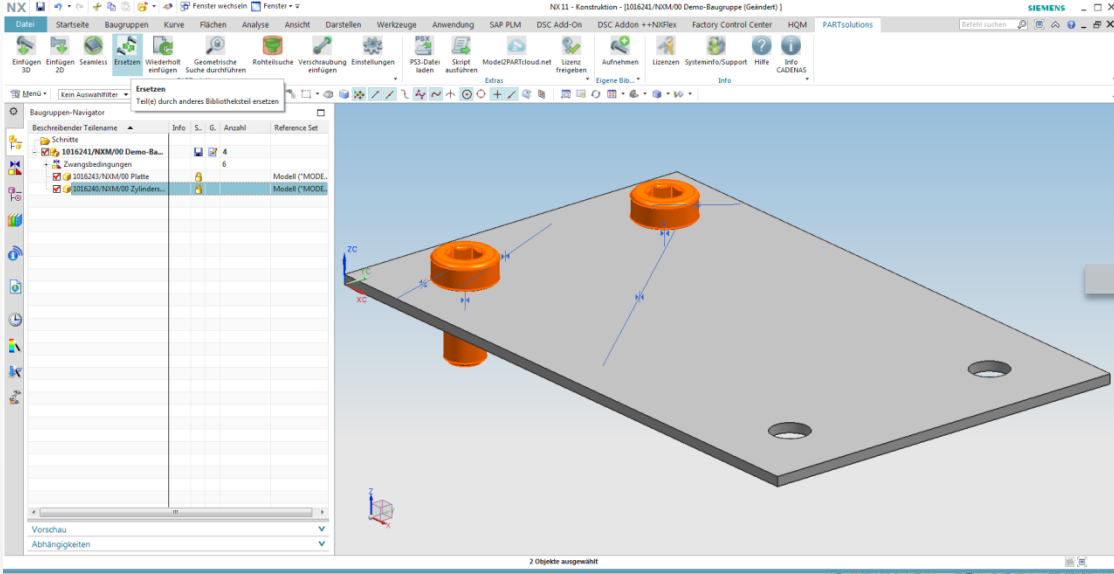


4: Add

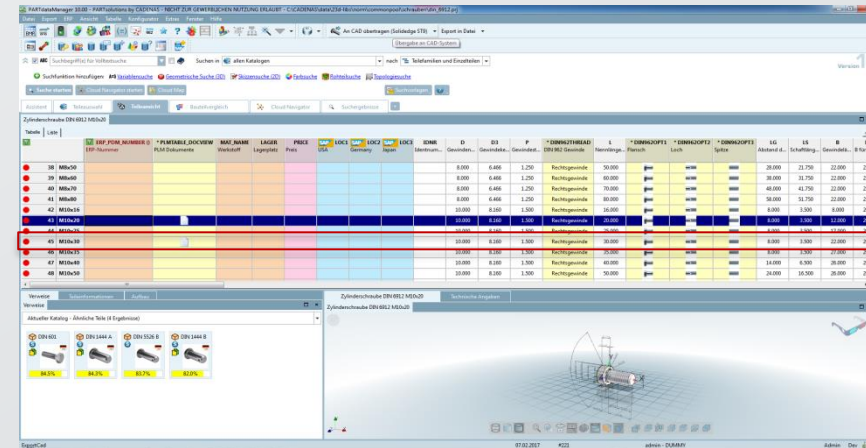
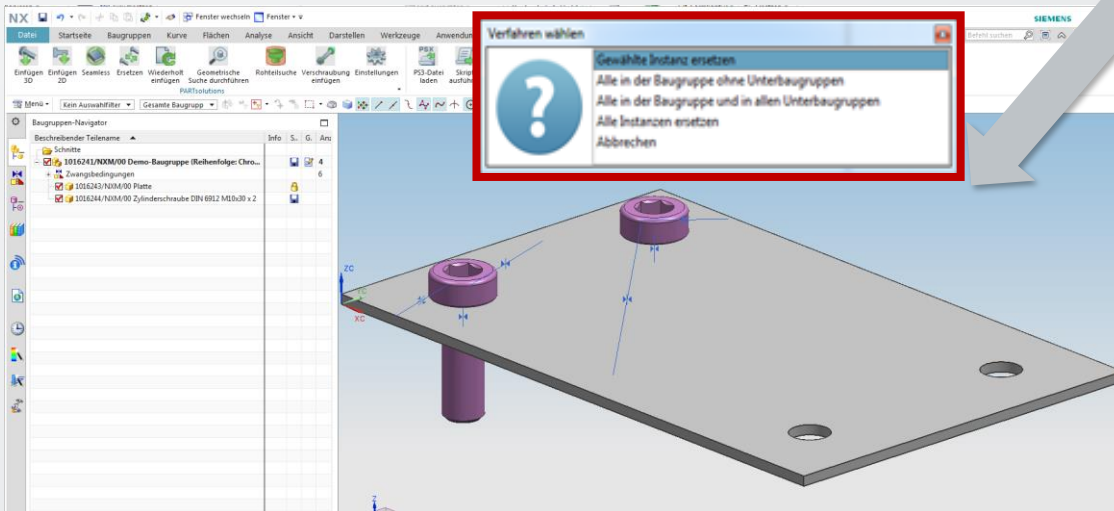


Replacing one component by another

Replacing components / Instance or all instances



Part not
in SAP



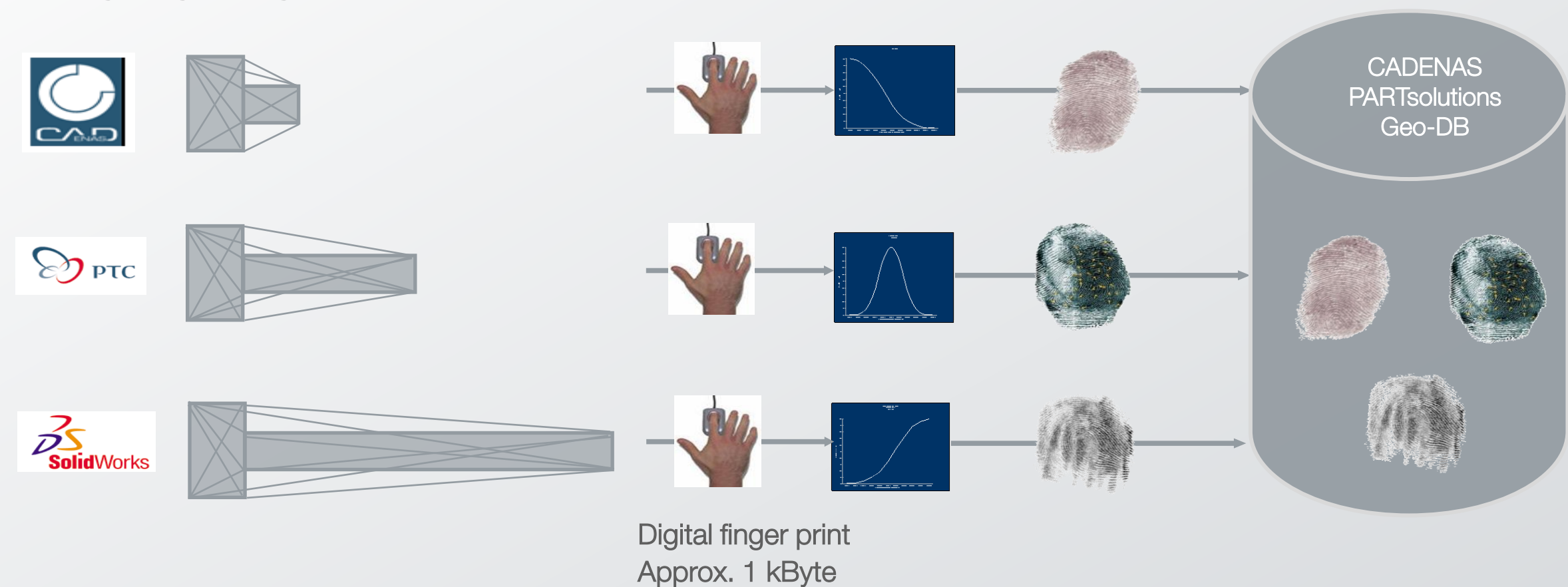
Part in SAP



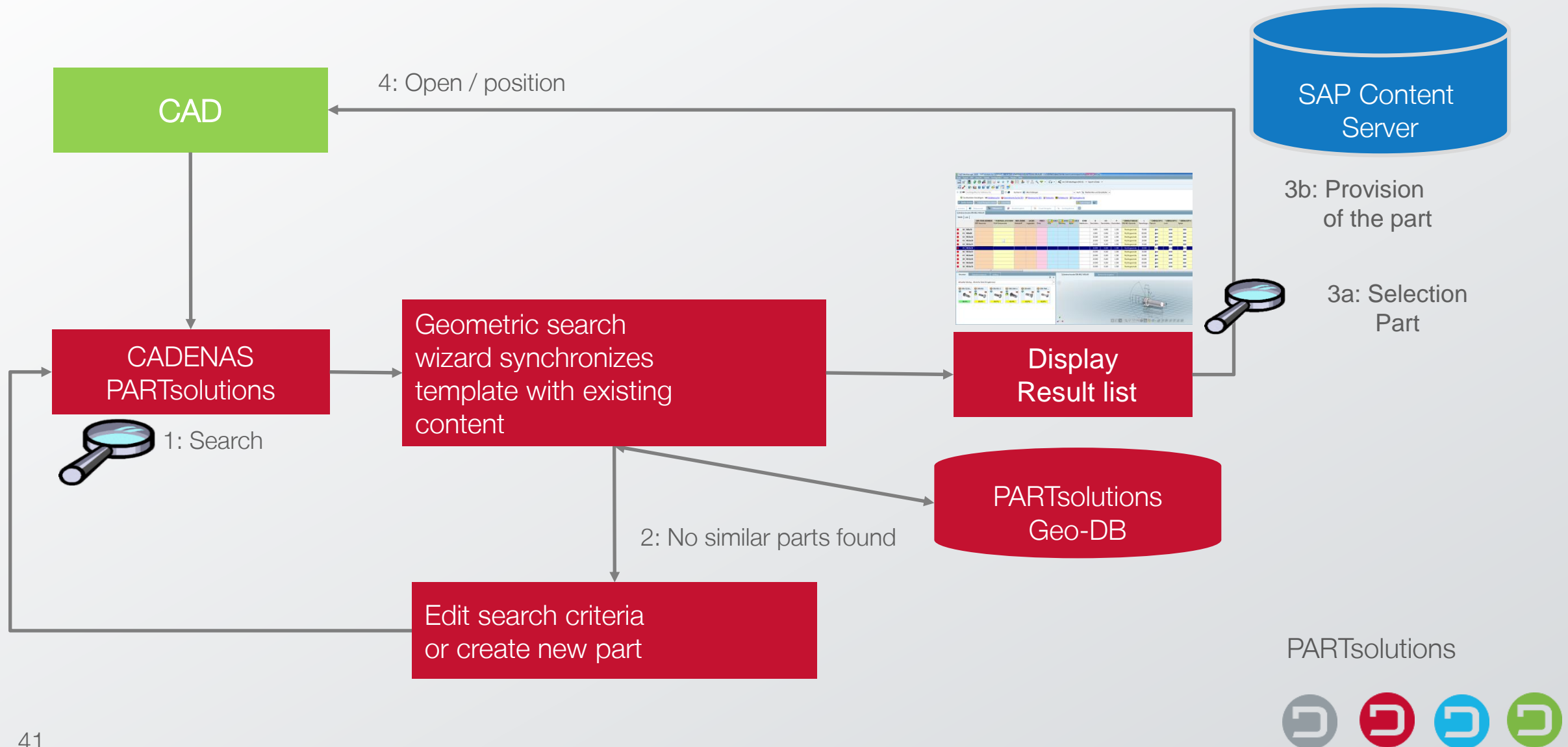
Geometric similarity search

Geometric similarity search

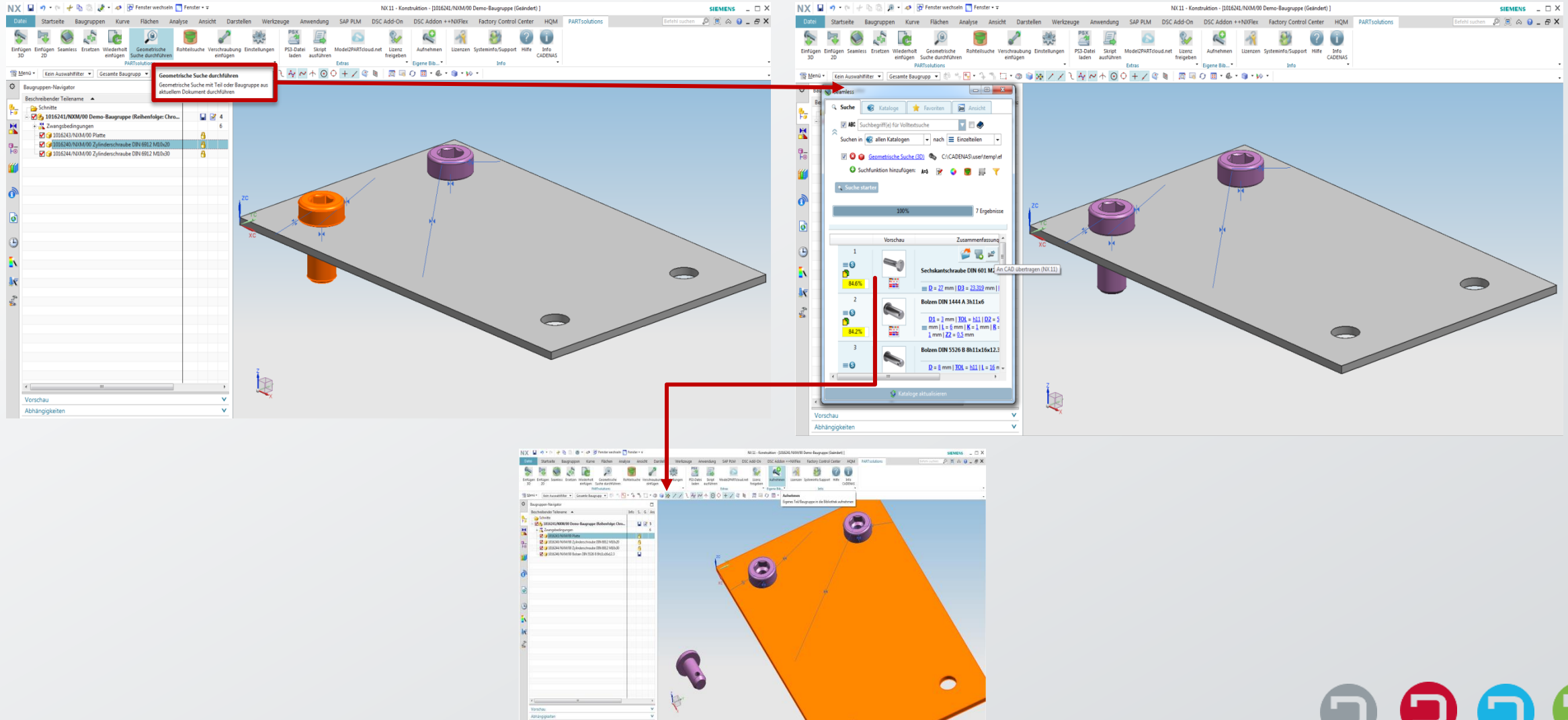
Creating a digital fingerprint



Procedure of the geometric similarity search



Using geometric similarity search from within CAD



Scope of ++PARTsolutions

Geometric similarity search

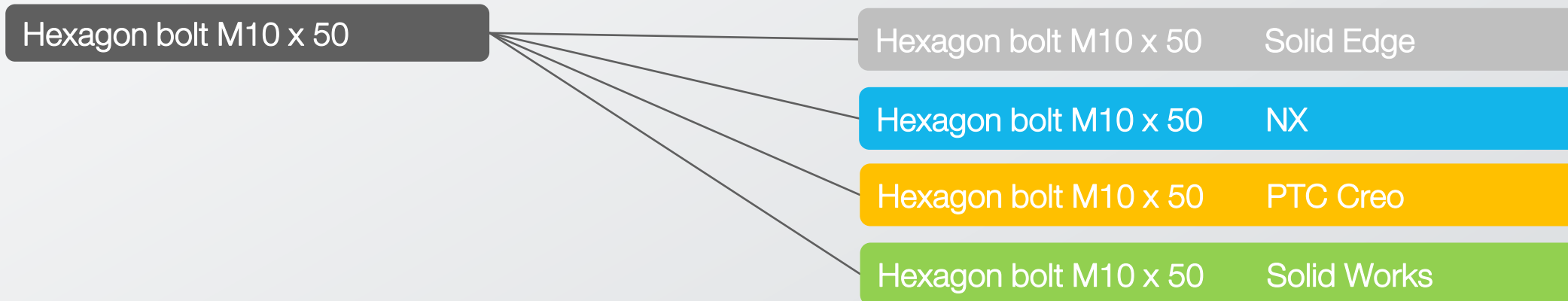
- Different search functions, e.g.
 - Search with the help of 2D sketches
 - Search with catalog selection systems
 - Search with external geometries
 - Background search
 - Topology search



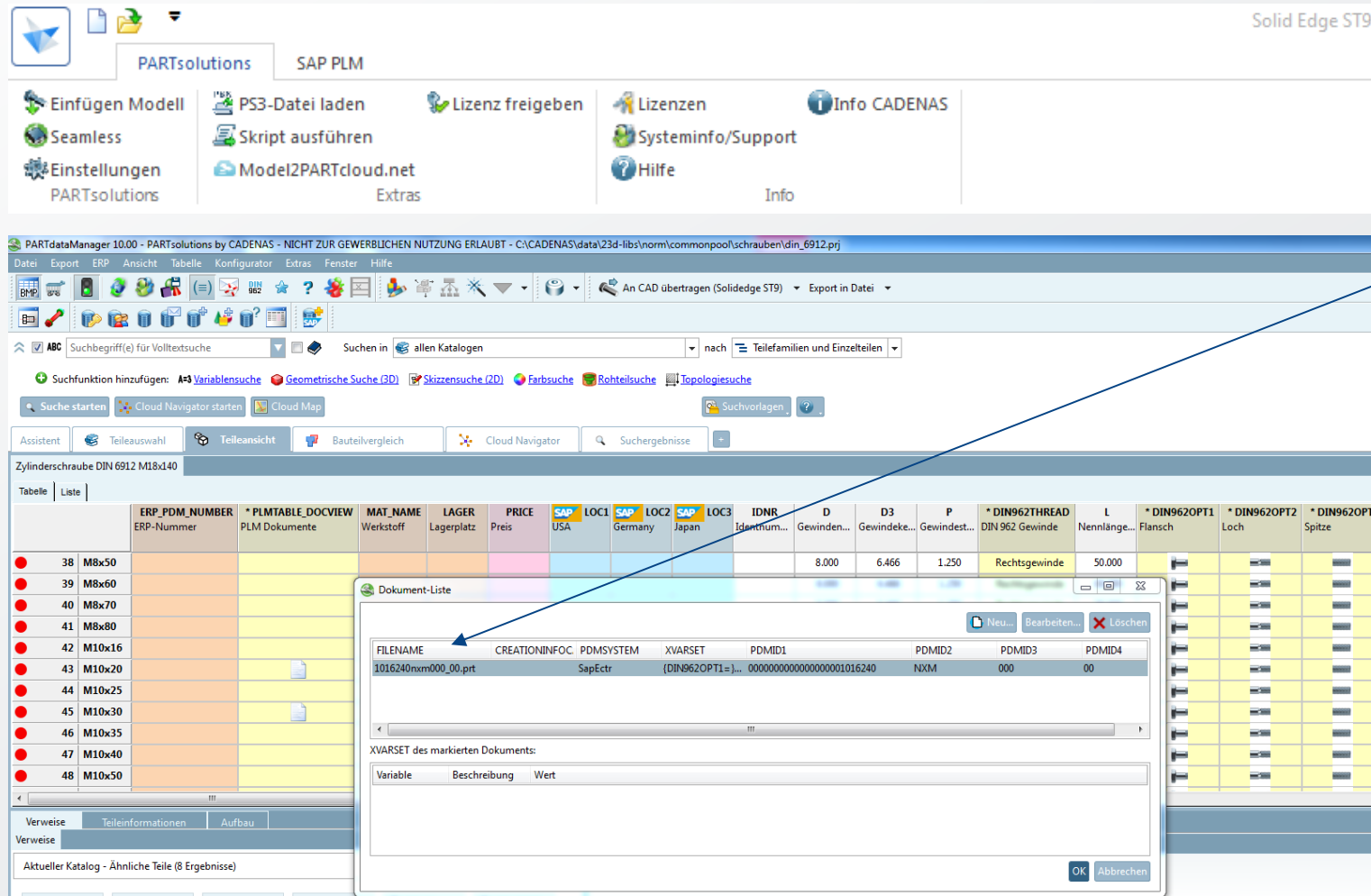
MultiCAD

MultiCAD

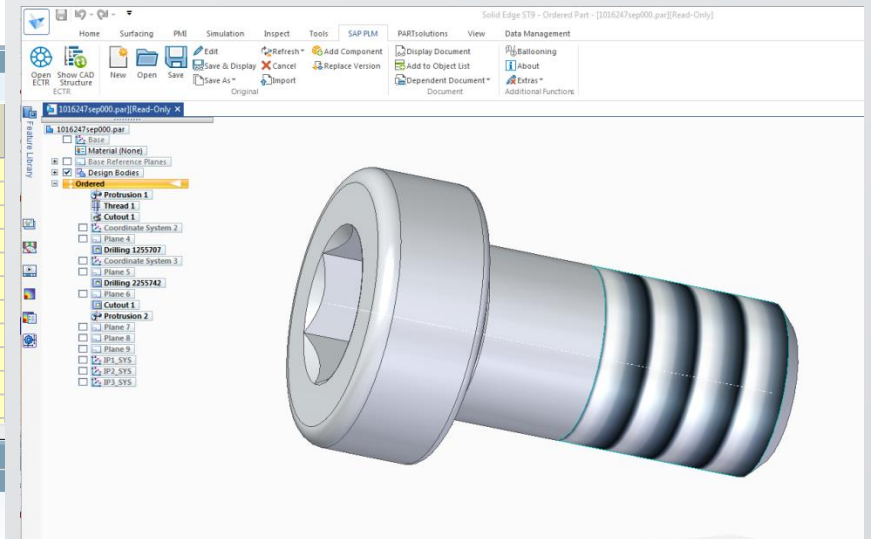
- Search from PARTsolutions
- PARTsolutions knows from which CAD system it was started
- Prefiltered search via the corresponding document type
- In SAP, multiple documents are assigned to one material master



Creating a component with Solid Edge



Another file format exists for the selected part



Creating a component with Solid Edge

The screenshot displays two SAP interfaces. On the left, the 'PARTDataManager 10.00' window shows a table of parts with columns for ERP number, PLM documents, material name, and various technical specifications. A 'Dokument-Liste' (Document List) dialog is open, showing a list of files with their creation information and document IDs. A blue arrow points from the text 'Several file formats and documents exist in SAP' to the 'Dokument-Liste' dialog. On the right, the 'Schreibtisch' (Writing Table) window shows a list of documents with their IDs, names, and statuses. A blue arrow points from the text 'Several documents are linked' to the 'Verknüpfte Objekte' (Linked Objects) section of the 'Schreibtisch' window.

Several file formats and documents exist in SAP

Several documents are linked



Added value through process integration

- Simple access to a large pool of standard and purchased parts maintained by the manufacturers
 - Higher level of reuse through user-friendly search mask
 - Integrated 3D preview of the components
 - High-performance search by attributes
 - Geometric similarity search for 3D models
 - Display of current SAP infos supports competent selection
- Efficient setup of a parts library through simple creation of new standard and purchased parts in the respective CAD data format in accordance with SAP document naming conventions
- Optimized catalog update for PARTsolutions with versioning support by means of SAP-driven where-used list for parts



Intelligent parts management – what does it need?

- ✓ ONE system for providing current and marketable standard and catalog parts for common CAD systems
CADENAS PARTsolutions
- ✓ ONE system for the management and release/change control of own and purchased with integrations for common CAD systems
SAP Engineering Control Center interface to CAD, e.g. NX
- ✓ ONE solution for the integration of the standard and catalog system with SAP
++PARTsolutions
- ✓ ONE system for the control of purchasing processes, production processes and engineering processes
SAP

Questions?



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Fascination with Integration

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Many thanks for your attention
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Fascination with Integration

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