

Parts management with SAP Engineering Control Center in the Multi CAD environment

Integration of CADENAS with SAP
17th CADENAS Industry forum 2016
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Augsburg March 9, 2016



Agenda

Requirements

Parts management with SAP

Interaction of PARTsolutions, CAD and SAP

Creation of standard parts and purchased parts in SAP

Retrieval of existing parts - search methods

Management of parts from different CAD systems

Summary

What do our customers want?

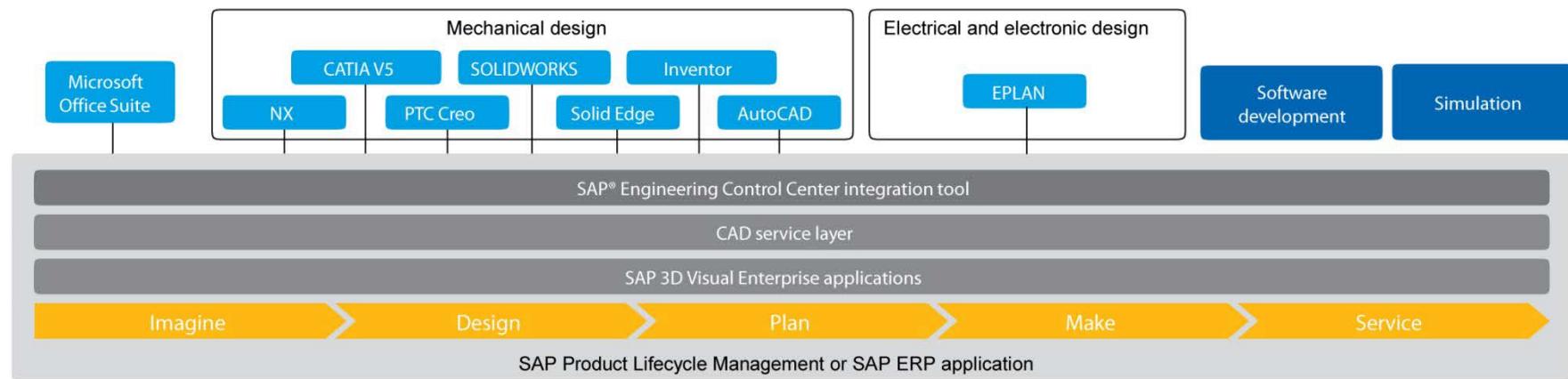
- Standardization / harmonization of parts – Put things straight and get organized to avoid confusion:
 - Quick retrieval and reuse of parts instead of designing new construction models
 - Quick access to correct and up-to-date standard parts and purchased parts
 - Reduced construction effort
 - Best possible utilization of the parts in the construction process and in downstream processes, e.g. CAM, simulations, large assemblies
 - Reduction of process costs, e.g. for procurement, substitute parts management, change processes, storage
- Information as a basis for decisions:
 - Make-or-Buy
 - Costs
 - Availability / stock

Manage your parts methodically correct, in an organized way, for decisions!

What do designers want?

- Access to up-to-date 3D models of several manufacturers (standard and catalog parts), in conformity with your own CAD method
- Quickly find parts and solutions - instead of searching for them:
- Efficient user interfaces – up-to-date technical and business information at one glance:
 - CAD data (geometry, weight, ...)
 - ERP data (preferred parts, availability, ...)
 - Is it possible to replace the part with a similar one?
 - Which parts must not be used?
 - Which parts are the cheapest?
 - Which parts are available / in stock?
- Simple classification of individual parts – preferably in an automated way

SAP Engineering Control Center | SAP's Integration Platform



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, Email, Software, ...

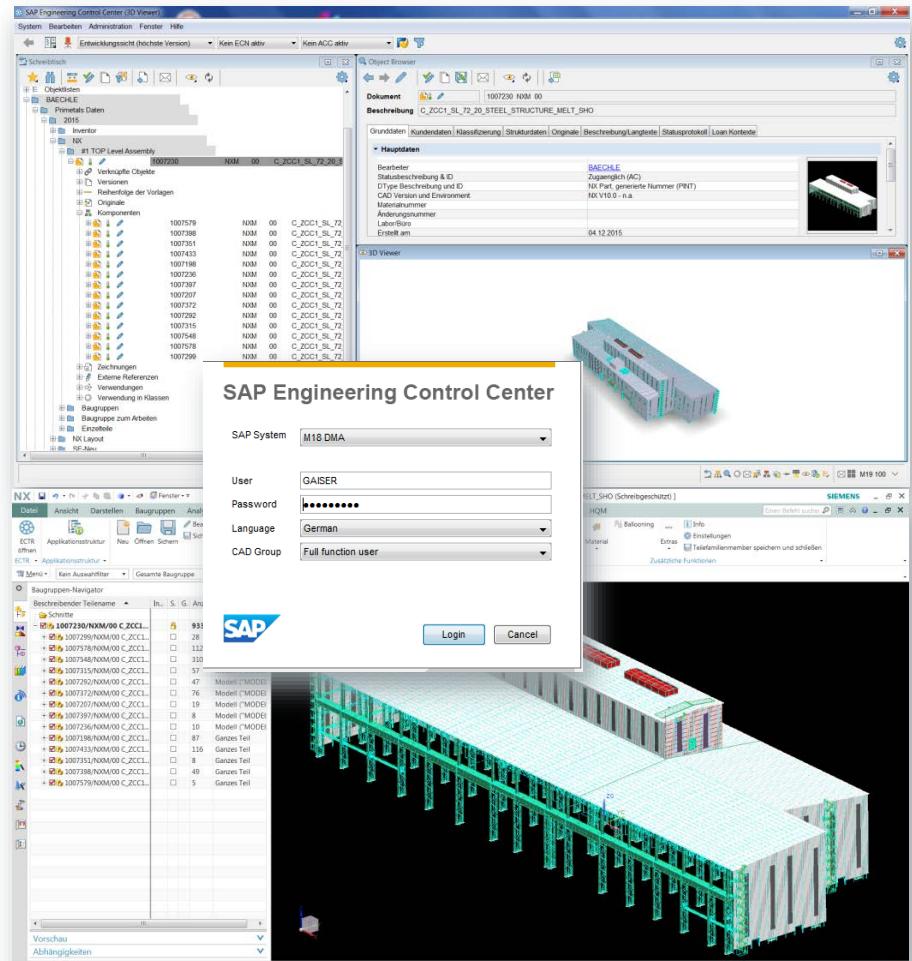
360° product view including mechanically, electronics, software, simulation etc.

Ideal user interface for authors

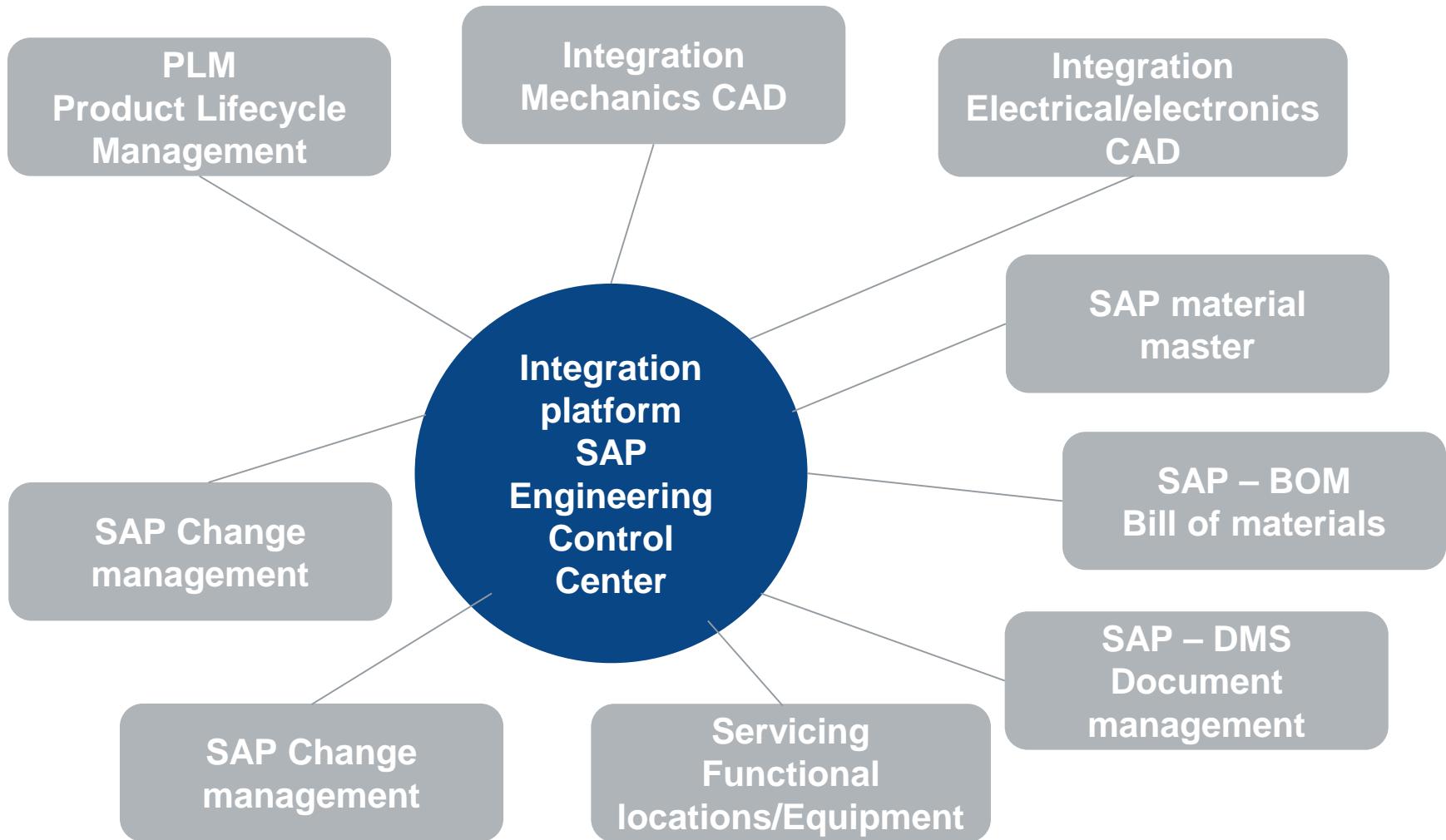
- Easy and intuitive utilization of rich SAP data

ONE integrated system for PLM and ERP

- Efficient working environment
- Automated workflows and processes
- Consistent engineering processes and logistics processes



SAP Engineering Control Center



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

The top screenshot displays a SAP interface titled 'Auswahl Klasse über Hierarchie' (Selection Class via Hierarchy). It shows a hierarchical tree of part classes under 'BM' and 'BM05'. A context menu is open over a node, listing options such as 'Zuladen' (Upload), 'Alle Spalten optimieren' (Optimize all columns), 'Alle expandieren' (Expand all), 'Alle komprimieren' (Compress all), 'Teilbaum komprimieren' (Compress subtree), 'Klasse anzeigen' (Show class), 'Merkmale zur Klasse' (Attributes for class), 'Klasse auswählen' (Select class), and 'Schließen' (Close). The bottom screenshot shows a SAP search interface titled 'Erweiterte Suche' (Advanced Search). It includes fields for 'Suchschlüssel' (Search key) and 'Volltextsuchen' (Full-text search) with various search parameters. The status bar at the bottom indicates 'Gesuchter Inhalt: 0 Seite: 0 von: 0'.

Retrieve and reuse parts

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

The screenshot illustrates the SAP Material Classification interface, showing how to retrieve and reuse parts through a hierarchical search and graphical results.

Top Left: A tree view of the classification structure under "Klassifizierung". The node "Schrauben" is selected. Below it, a list of sub-categories: Senkkopfschrauben, Sechskantschrauben, Zylinderschrauben, Gewindeschrauben, Muttern, Scheiben, Betriebsmittel, and Email.

Top Center: An "Object Browser" window for the class "Schrauben (0_1100) - 001". It shows four types of screws: Senkkopfschrauben, Sechskantschrauben, Zylinderschrauben, and Gewindeschrauben, each with a small image.

Middle Left: Another "Object Browser" window for the class "Sechskantschrauben (0_1120) - 001". It shows three specific screw types: DIN 931, DIN 933/ISO 4017, and DIN 6914, each with a small image.

Bottom Left: A detailed configuration dialog for "Sechskantschrauben (0_1120) - 001". It includes a table for defining search criteria based on feature descriptions like "Nennlänge (l)" and "Kopfhöhe (k)".

Right Side: A detailed catalog view for "DIN 933/ISO 4017 Sechskantschraube". It lists various screw models with their technical specifications:

Zugeordnetes Modell öffnen/verwenden/Markieren	Bezeichnung	Gewindelänge (l)	Gewindesteigung (P)	Kopfhöhe (h)	Neu
865 FERT_Sid-Schraube M3x6 DIN933-8.8	M3	0.5 mm	2.0 mm	6,0	<input checked="" type="checkbox"/>
866 FERT_Sid-Schraube M4x10 DIN933 hitzebest... M4	M4	0.7 mm	2.8 mm	10	<input type="checkbox"/>
867 FERT_Sid-Schraube M4x12 DIN933-8.8 M4	M4	0.7 mm	2.8 mm	12	<input type="checkbox"/>
868 FERT_Sid-Schraube M4x10 DIN933-A2 M4	M4	0.7 mm	2.8 mm	30	<input type="checkbox"/>
869 FERT_Sid-Schraube M4x10 DIN933-M8 M4	M4	0.7 mm	2.8 mm	30	<input type="checkbox"/>
870 FERT_Sid-Schraube M5x16 DIN933-8.8 M5	M5	0.8 mm	3.5 mm	16	<input type="checkbox"/>
871 FERT_Sid-Schraube M5x20 DIN933-A2 M5	M5	0.8 mm	3.5 mm	20	<input type="checkbox"/>
872 FERT_Sid-Schraube M5x20 DIN933-8.8 M5	M5	0.8 mm	3.5 mm	20	<input type="checkbox"/>
973 FERT_Sid-Schraube M5x25 DIN933-A2 M5	M5	0.8 mm	3.5 mm	25	<input checked="" type="checkbox"/>
974 FERT_Sid-Schraube M5x25 DIN933-8.8 M5	M5	0.8 mm	3.5 mm	25	<input type="checkbox"/>
975 FERT_Sid-Schraube M5x20 DIN933-A2 M5	M5	0.8 mm	3.5 mm	30	<input type="checkbox"/>
RTR FERT_Sid-Schraube M5x30 DIN933-A2 M5	M5	0.8 mm	3.5 mm	30	<input type="checkbox"/>

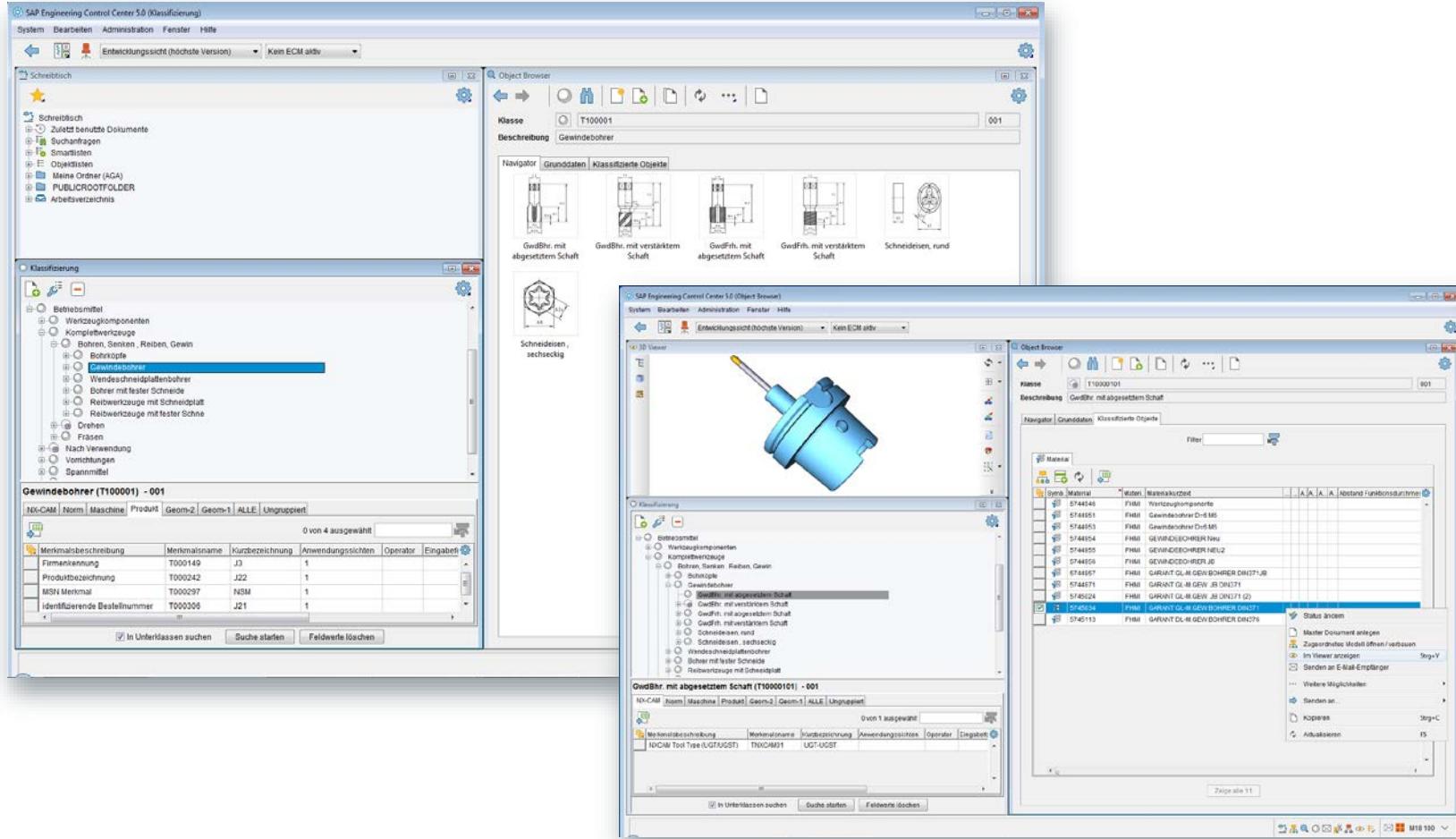
Bottom Right: A list of four icons representing different CAD systems: Dassault Systèmes (CATIA), Siemens (NX), PTC (Creo), and Autodesk (AutoCAD).

Bottom Center: Summary text: "Parts management with SAP Engineering Control Center in the Multi CAD environment".

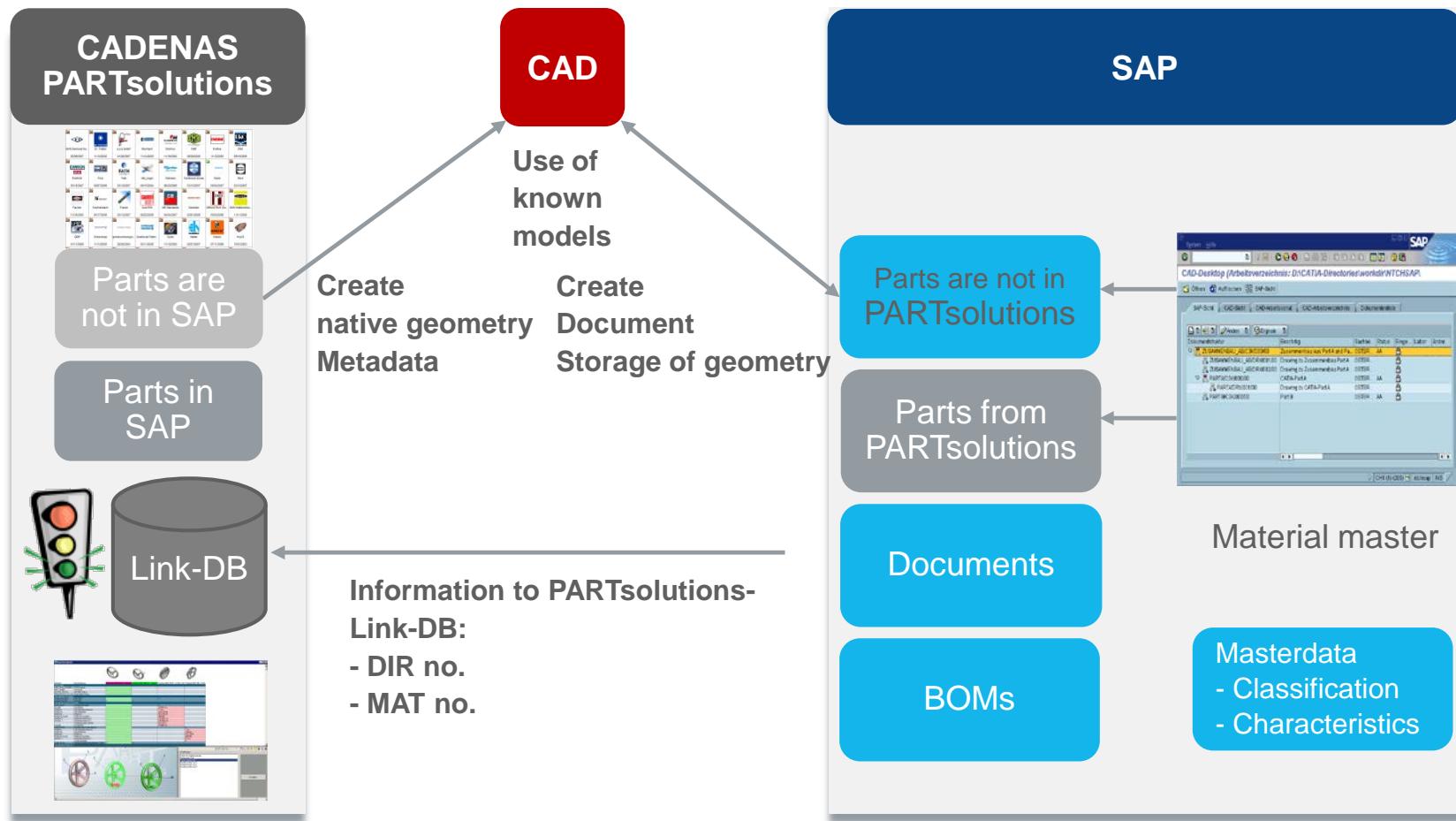
Bottom Right: Date and page number: "2/25/2016 | Page 9".

Retrieve and reuse parts

Example: find tools assemblies via SAP material classifications



Fundamental interaction of CADENAS PARTsolutions with CAD and SAP



CADENAS PARTsolutions - business data and technical data in one user interface

The screenshot displays the CADENAS PARTsolutions software interface, version 9.07. The main window shows a table of cylinder head screws (Zylinderschraube DIN 6912 M18x140) with various characteristics and their SAP data.

NB	ERP/PDM	ERP_PDM_NUMBER	SAPMATERIAL	SAPSTATUS	WERKSTOFF	MAKTX_DE	* PLMTABLE_DOCVIEW	IDNR	D	D3
112	M18x140						kein Dokument		18.000	14.933
113	M18x150						kein Dokument		18.000	14.933
114	M18x220						kein Dokument		18.000	14.933
115	M20x30						kein Dokument		20.000	16.933
116	M20x30	#13457189060	2401	01	10.9	Armaturen aus nichtrostendem Stahl für A	ein Dokument		20.000	16.933
117	M20x35						kein Dokument		20.000	16.933

Annotations in the interface:

- Up-to-date SAP data of the part**: Points to the SAP data table.
- Display of class structures**: Points to the left sidebar showing measurement views and representation modes.
- Search in characteristics**: Points to the search bar at the top of the SAP data table.
- Data for 2D and 3D CAD**: Points to the bottom right corner showing a 3D model and 2D drawing.

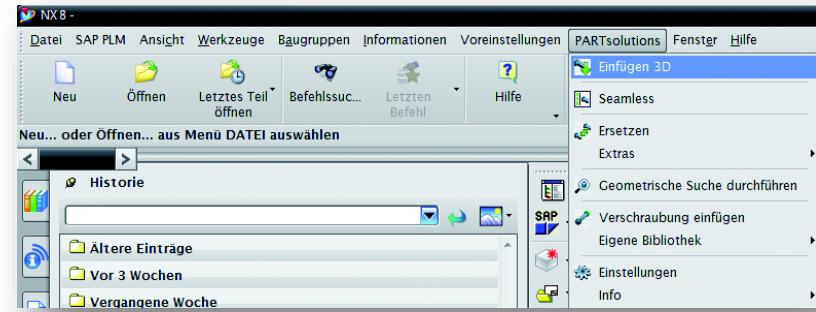
Anwendungsszenarien

	Szenario	Nutzen
1	Use of catalog parts, New creation in SAP	<ul style="list-style-type: none">▪ More than 600 different catalogs▪ Standard and purchased parts can be directly included into the respective CAD system▪ Newly created part as a document in SAP▪ OPTION: linkage to material
2	Transfer of the classification to SAP upon check-in	<ul style="list-style-type: none">▪ While saving, the part information is transferred to the document, material, classification
3	Reuse of a part	<ul style="list-style-type: none">▪ Search in PARTSolutions or in SAP▪ Full text search, geometrical similarity, material, search for all objects
4	Suche nach ähnlichen Teilen	<ul style="list-style-type: none">▪ Geometrical similarity search in PARTsolutions, PLMSynchro also allows for searching for individual parts in PARTsolutions

Management of standard and purchased parts in SAP?

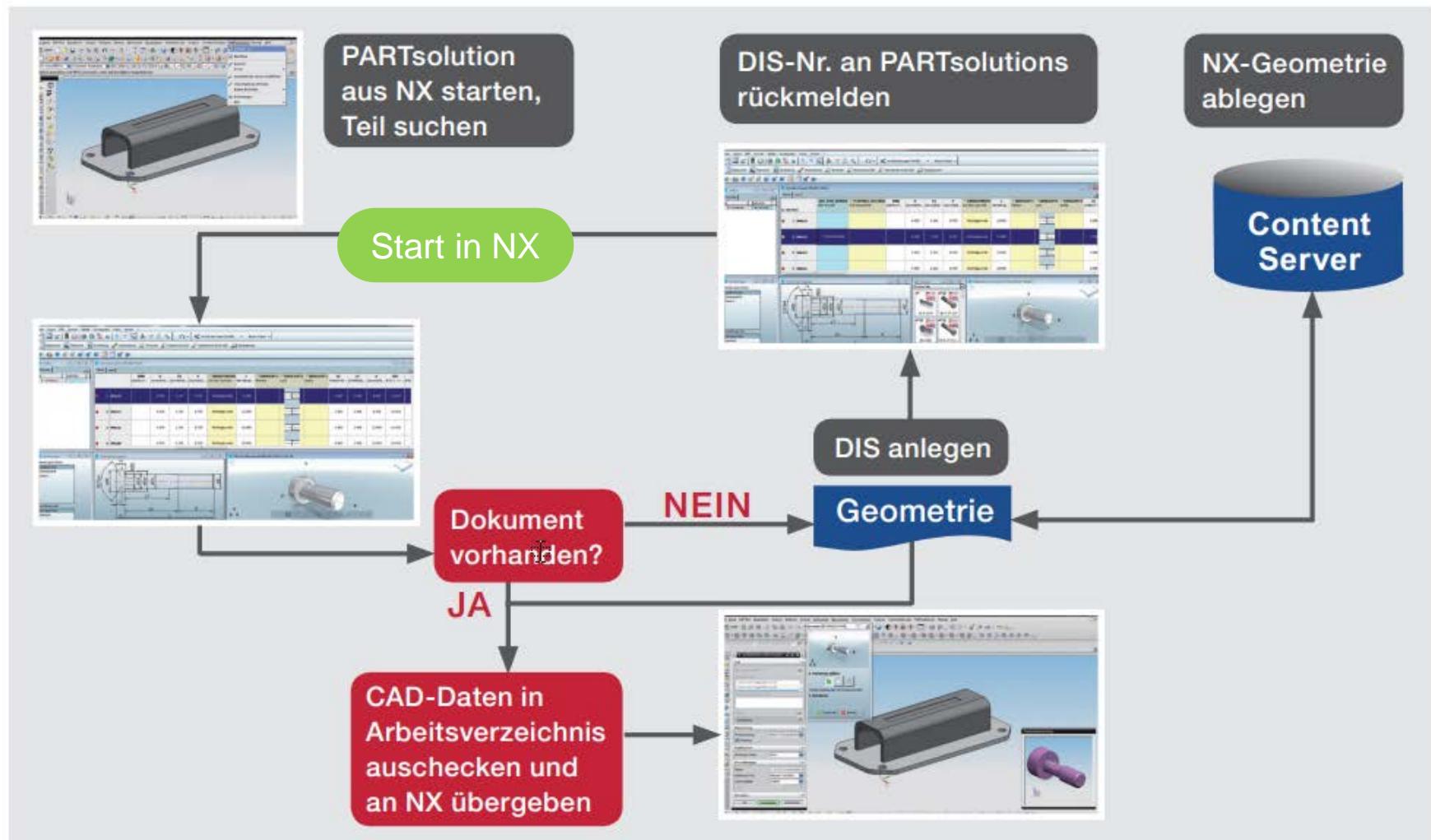
CADENAS Partsolutions supplements the existing PLM process:

- Access to standard part catalogs and to more than 600 manufacturers' catalog. Updates are done 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
- Execute search for parts from CAD using ++partSolutionsNX, e.g. by geometrical similarity search



General process flow

Example: CAD system NX



Scope of functions ++PARTsolutions

- Starting CADENAS PARTsolutions from the CAD system
- Search with PARTsolutions / PARTdataManager:
 - Graphical search
 - Attribute search
 - Full text search
 - Via SAP info such as part number
 - Geometrical similarity search
- Check: part exists / does not exist in SAP

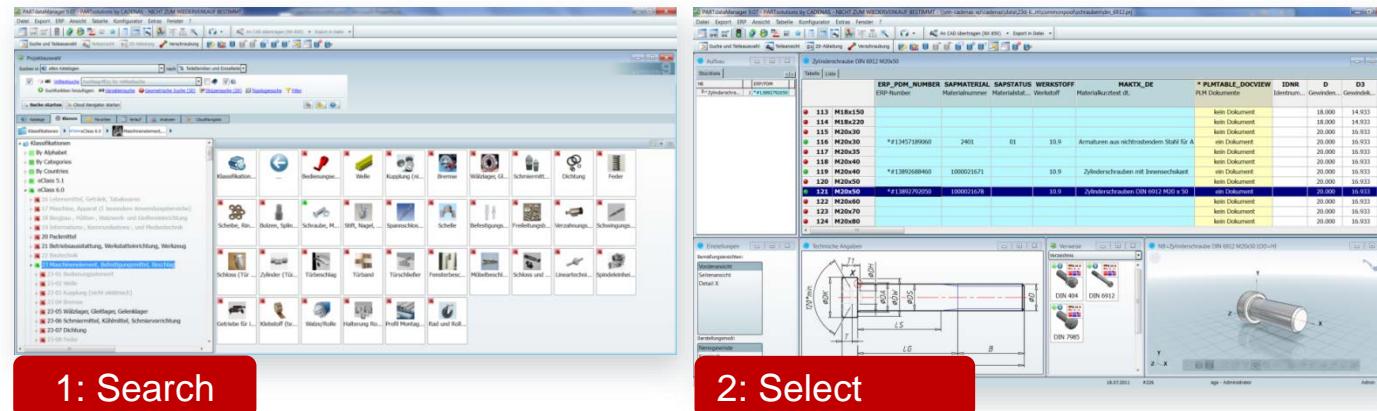
Scope of functions ++PARTsolutions

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

- If a part has been selected for opening or adding, a check is performed to determine whether it exists in SAP:
 - Part does not exist in SAP:
Function "An CAD übertragen" generates the geometry and the part is created as SAP document according to the number and name conventions:
The CAD original is stored on the SAP Content Server.
 - Part exists in SAP:
Part is directly checked out from the SAP Content Server and opened in CAD or added to the assembly.

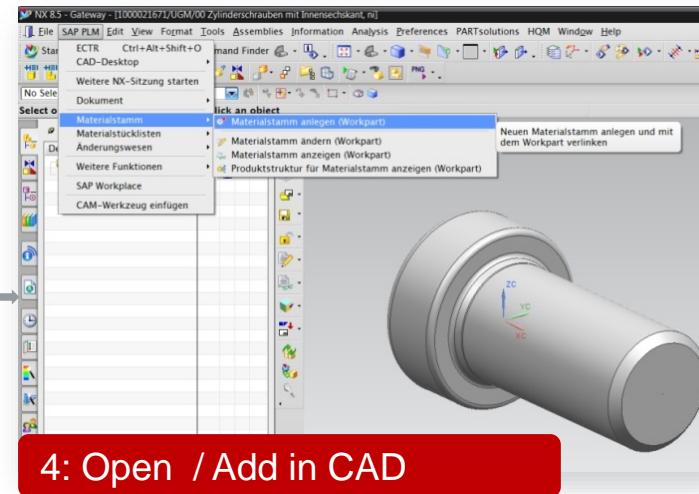
Neuteilanlage

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 in CAD

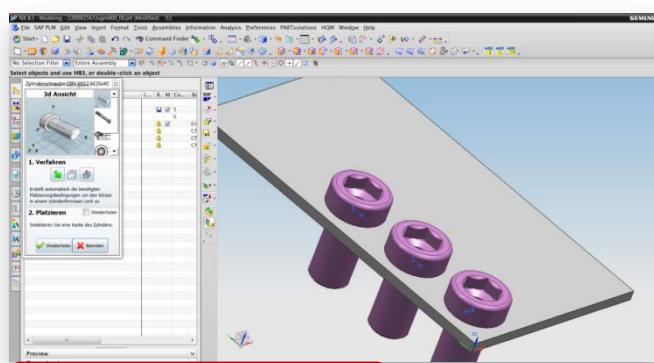
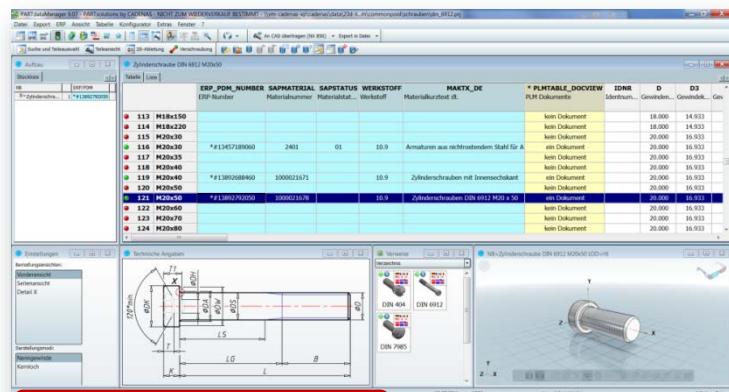
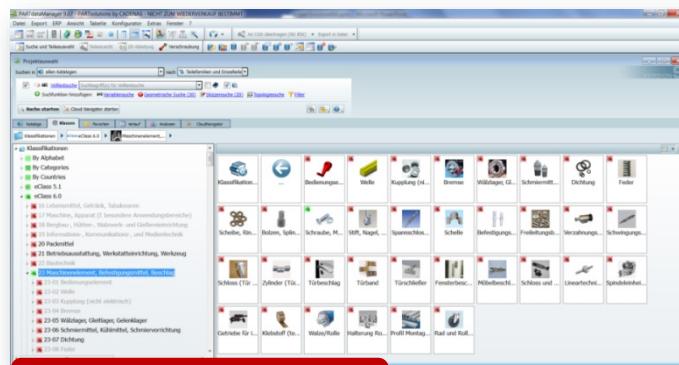
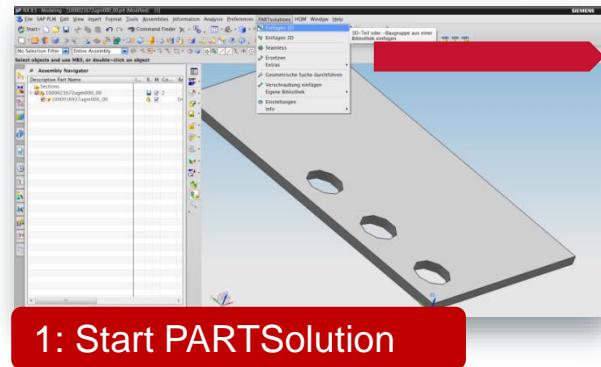
Scope of functions ++PARTsolutions

- OPTIONAL: Creation of a material master in SAP when creating a new part from PARTsolutions and creation of a link to 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 (requires PARTsolutions / base module ERP LinkDB).
- PARTsolutions metadata from document properties are mapped on fields of the SAP material master if an automatic material master creation process has been implemented in SAP
- Function for cyclic matching of data between the LinkDB and SAP available if the material master has been subsequently linked with a document info record (requires ERPsolutions/db Professional).
- In PARTsolutions / base module ERP LinkDB roles, views, and permissions can be configured. For instance, a "traffic light" is configured. Parts highlighted in green are preferably added while parts highlighted in red may no longer be used.
- PARTsolutions/base module ERP linkdb enables you to display information from SAP in further columns in the user interface of CADENAS PARTsolutions

Finden und Wiederverwenden von vorhandenen Norm- und Katalogteilen

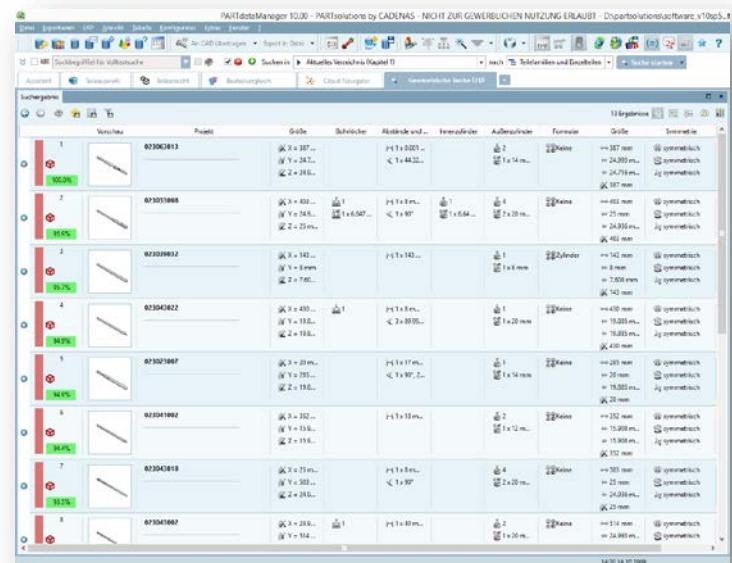
Find a part in CADENAS PARTsolutions and open / use it in NX

Process sequence



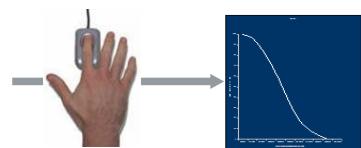
Geometrical similarity search

- Fingerprints and preview images as well as a list according to the degree of similarity enable the user to select the appropriate part:
- Geometrical search and parts comparison of all standard and purchased parts as well as checked in, company-internal individual parts.
- Geometrical design assistant. In the design process is constantly checked whether identical or similar company-internal parts are available in the company or whether there are identical or similar standard and purchased parts.

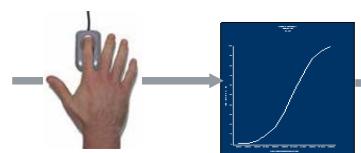
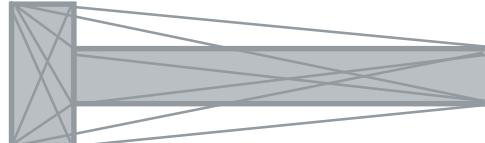
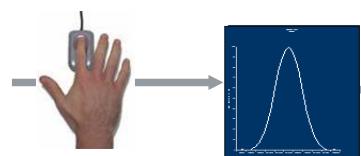
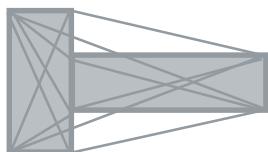


Geometrical similarity search

Creation of a digital fingerprint

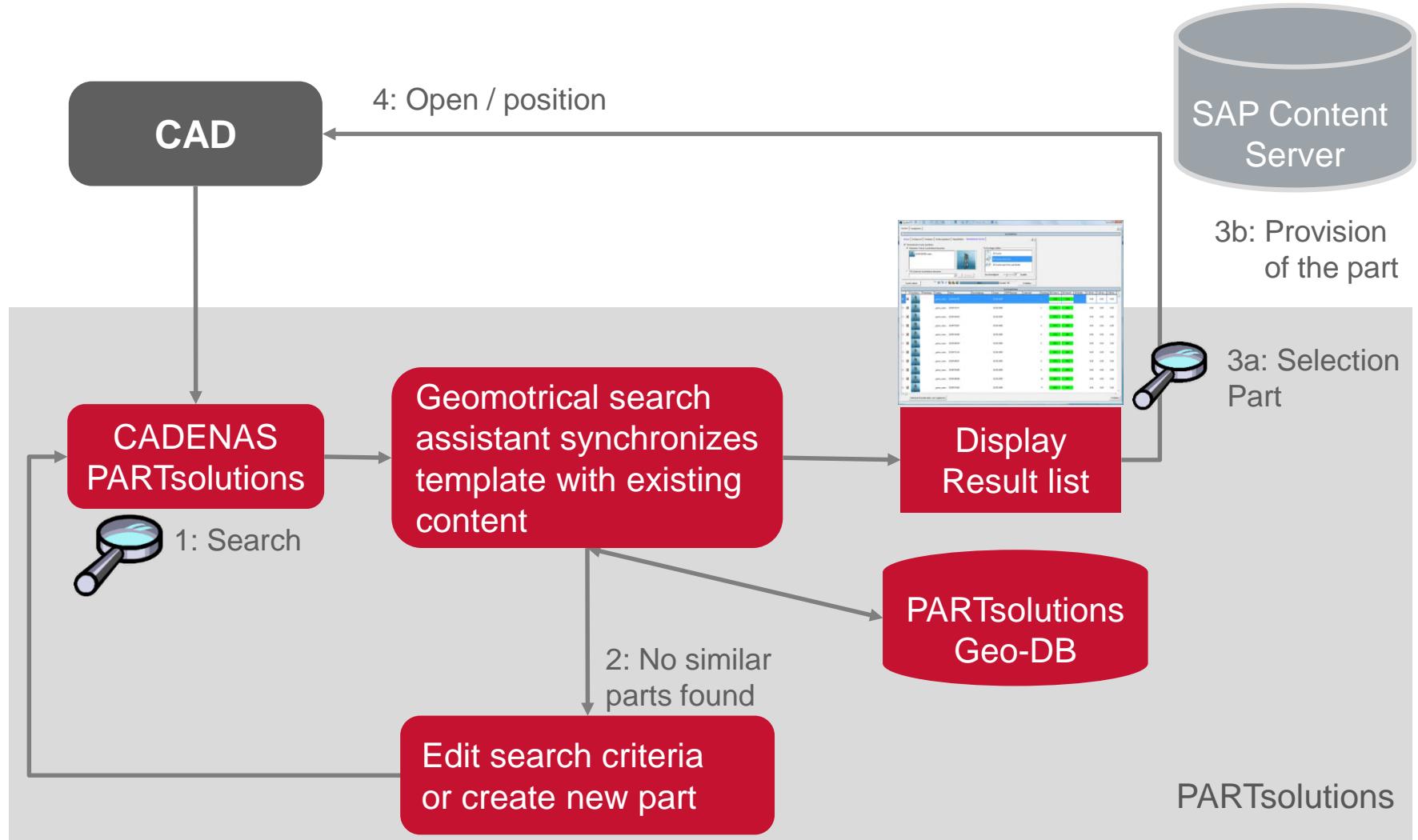


CADENAS
PARTsolutions
Geo-DB



Digital finger print
Approx. 1 kByte

Procedure of the geometrical similarity search

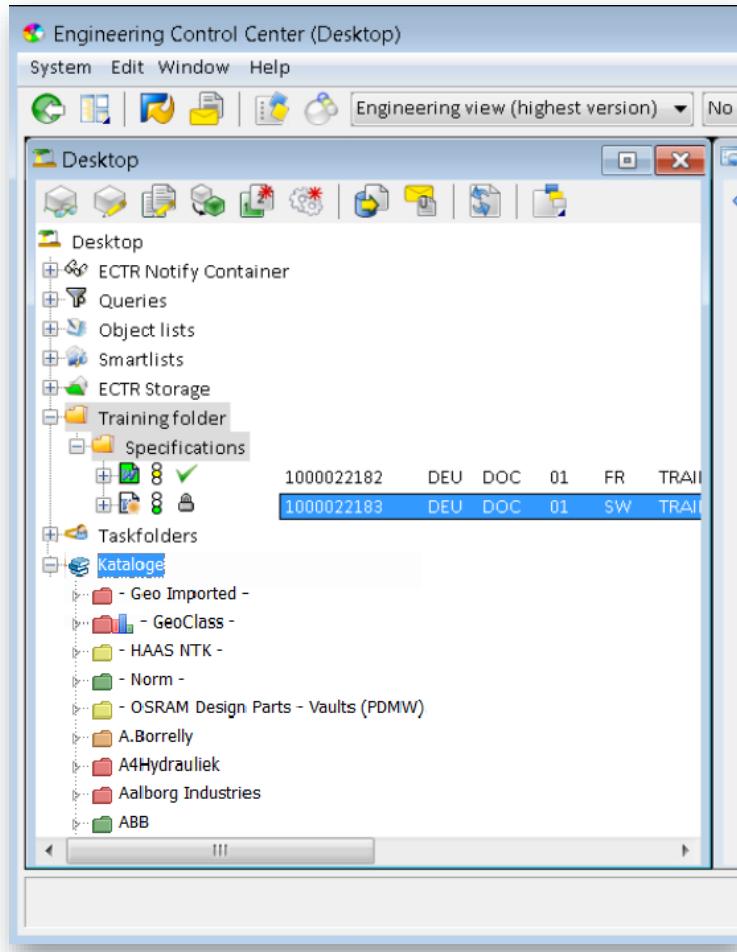


Scope of functions ++PARTsolutions

Geometrical similarity search

- Several search functions, e.g.
 - Search with the aid of 2D sketches
 - Search with catalog selection systems
 - Search with external geometry
 - Background search
 - Topology search

++PARTsolutions | Index Browsing in SAP ECTR



Lab
Preview

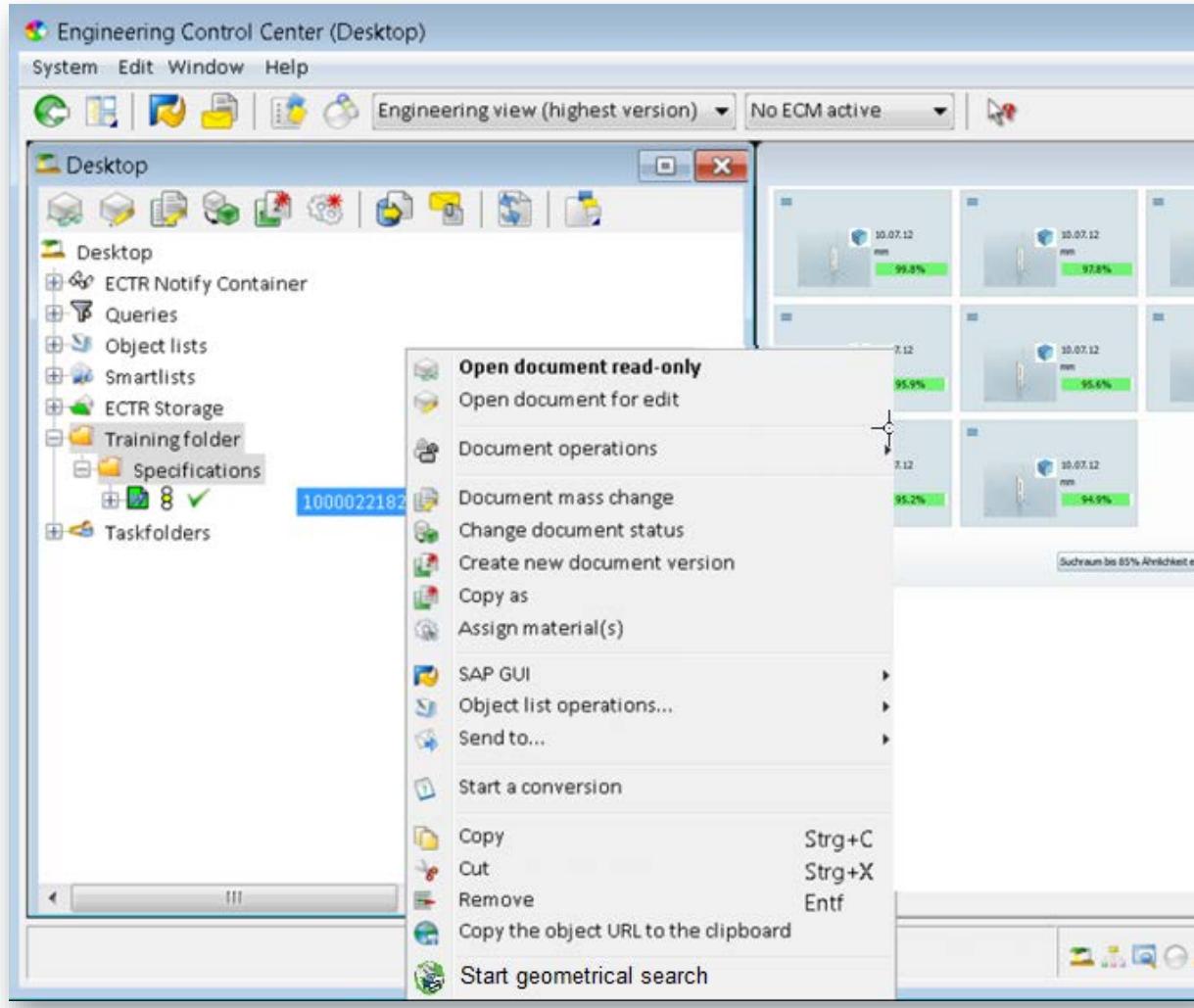
Table and technical preview

The screenshot shows the SAP Engineering Control Center (Desktop) interface. On the left is a navigation tree with sections like Desktop, ECTR Notify Container, Queries, Object lists, Smartlists, ECTR Storage, Training folder (selected), Specifications (selected), Taskfolders, Kataloge, and various imported catalogs. In the center, there's a table view showing part specifications:

E	L1	L2	L3	R1	R2	R3	R4
Abstand b... Gesamthöhe	Länge (ca... Länge der...)	Zapfenlän...	Bundlänge... Rundung ...	Rundung ...	Verrundun...	Radius Ge...	
12.000	32.000	7.000	4.000	2.000	20.000	9.500	0.400
15.000	40.000	9.000	5.000	2.500	24.000	14.500	0.400
18.000	50.000	11.000	7.000	3.000	30.000	19.000	0.400

Below the table is a 3D model of a part with a green Y-axis, red X-axis, and blue Z-axis. To the right is a 2D technical drawing of the part with dimensions: L1=32, L2=7, L3=4, R1=2, R2=20, R3=9.5, R4=0.4. A red callout box in the bottom right corner contains the text "Lab Preview".

Geometrical similarity search



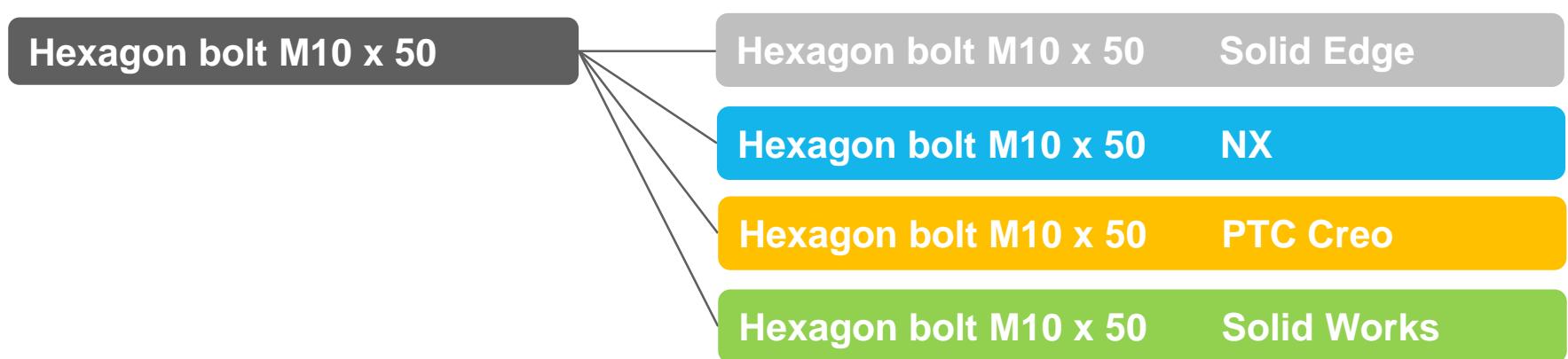
Lab
Preview

PLMsynchronization

- This also own parts are with the Geo search PARTsolutions found the parts information from SAP are synchronized by PARTsolutions

MultiCAD

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



Additional value through process integration

- Easy access to a large pool of standard parts and purchased parts and which is maintained by the manufacturers
- Increased reuse rate thanks to a user-friendly search mask
 - Integrated 3D preview on the parts
 - Powerful search of attributes
 - Geometrical similarity search for 3D models
 - Display of current SAP information support the targeted selection
- Efficient construction of a parts library by simple installation of new standard and supplier parts in the CAD data format according to SAP Document Naming Conventions
- Optimized catalog update for PARTsolutions with versioning support enabled by a SAP-driven where-used list

Intelligent part management – what's necessary?

- ONE system for the provision of up-to-date and saleable standard parts and catalog parts for the common CAD systems
 - ✓ **CADENAS PARTsolutions**
- ONE system for the management and release / change control of individual parts and purchased parts with integrations for the common CAD systems
 - ✓ **SAP Engineering Control Center interface to CAD, such as NX**
- ONE solution for the integration of the standard part and catalog system with SAP
 - ✓ **++PARTsolutions**
- ONE system for the control of purchase processes and production processes and engineering processes
 - ✓ **SAP**

Questions?



Many thanks for your attention!

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