Standard and catalog parts in CAD
Motivation, function, development and vision

25.03.2019 | M. Fuß TSC
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Company milestones

1949
Founding of DEWITTA
Special Machinery Factory

1979
Manfred Wittenstein takes over DEWITTA

1983
First low-backlash planetary gearbox

1989
Start of international expansion

1992
Expansion of the range of services: Electromechanics

2001
Founding WITTENSTEIN AG

2008
Training center WITTENSTEIN talent arena

2008
WITTENSTEIN AG acquires majority stake in attocube systems AG

2011
“Urbane Production” in Fellbach

2014
“WITTENSTEIN Innovation Factory” in Harthausen

2015
World first Galaxie® Drive System revolutionizes high-performance mechanical engineering

2016
WITTENSTEIN AG becomes WITTENSTEIN SE

2017
WITTENSTEIN SE acquires 100% of the shares of baramundi software AG

2018
WITTENSTEIN AG acquires majority stake in attocube systems AG

2021
WITTENSTEIN SE becomes WITTENSTEIN SE

2022
WITTENSTEIN SE acquires 100% of the shares of baramundi software AG

2023
WITTENSTEIN SE acquires 100% of the shares of attocube systems AG
WITTENSTEIN international

... in about 40 countries worldwide
Structure of WITTENSTEIN SE

Supply Chain Management (SCM)
Production locations: Igersheim (D), Fellbach (D), Grüsch (CH), Sibiu (RO), Ueda (J), Chicago (USA)

Customers
- Nanotechnology
- Medical technology
- Servo drive systems
- Servo motors, electronics & mechatronic systems
- Oil & Gas Subsea, Defence
- Aviation and aerospace
- Medical technology

Value-adding Partners
- attocube systems
- baramundi software
- WITTENSTEIN alpha
- WITTENSTEIN cyber motor
- WITTENSTEIN motion control
- WITTENSTEIN aerospace & simulation
- WITTENSTEIN intens
- Nanotechnology
- Client Management Software
Mechanical and mechatronic drive solutions

WITTENSTEIN alpha GmbH
Entwicklung und Produktion hochpräziser Servo-Antriebe

WITTENSTEIN motion control GmbH
Maßgeschneiderte lineare und rotative Servosysteme

WITTENSTEIN aerospace & simulation GmbH
Mechatronische Antriebssysteme für die Luftfahrt

WITTENSTEIN intens GmbH
Intelligente Antriebslösungen im und am Körper

WITTENSTEIN cyber motor GmbH
Hochdynamische Servomotoren und Antriebs-Elektroniken

attocube systems AG
Nanopräzise Antriebs- und Messtechniklösungen
Presentation of WITTENSTEIN SE

WITTENSTEIN alpha Sizing Tools – mehrere Wege zum Ziel

https://alpha.wittenstein.de/de-de/produkte/sizing-tools/
A world first: Galaxie® Drive System
40% increase in profile rolling productivity

Application in gear rolling machines of Profiroll Technologies GmbH
• Extremely high torsional rigidity: 6 times higher than other types of gears
• With a 1.5-fold increase in process speed, an increase in productivity of 40% is achieved
“The Oscar for engineers”: HERMES AWARD 2015

WITTENSTEIN’s elementary new Galaxy Propulsion System beat out almost 70 participants from ten countries and was also able to assert itself in the field of five finalists.
Standard and catalog parts in the WITTENSTEIN PLM landscape
In 2015, when SAP was introduced, we were looking for a tool to help us clean up product data. However, the limited budget was not sufficient for the full range of functions.

So we started in 09/2015 with 20 users under V9 with NX9. Today max. 60 named users could use PARTsolutions.

The following range of functions was defined:

- Preferred catalogs – specification by the procurement department: standard, green, yellow, red all catalogs are searchable
- Automatic import into PDM-Agile E6 via the NTSPLM interface (Maier CSS / XPLM) with metadata filling
- Deep integration into NX-CAX with standardized geometric quality
Standard and catalog parts in the WITTENSTEIN PLM landscape

Infrastructure

Neu

Server Datenbank

Share

Client

PSOL Server
Kataloge
Einstellungen, Rollen...

MySQL für LinkDB
und PLMTABLE

3D CAD Share

3D CAD Client
NX 12.029 MP4

PDM Server
Prod Dev Edu

ORACLE

PDM Clients
Agile 6.20

PDM Share

NTSPLM
Schnittstelle
lokal auf Client

xPLM Koppelung

Dokument ins 3D CAD laden / zum Verbauen bieten

Schritt 1
Eingabe: Name, Benennung
Doc AC anlegen und Projekt zuordnen
Rückmeldung: Doc AC Nummer

Schritt 2
Doc AC anlegen, Doc Status 220 zu AC assoziieren
Doc AC Katalog Projekt zuordnen

Schritt 3

Alternativ ohne PDM Import
Direkt ins 3D CAD laden

Abgleich beim Start

Abgleich beim Start
Preferred catalogs
Standard and catalog parts in the WITTENSTEIN PLM landscape

PSOL – Preferred Catalogs – Classification by Purchasing Department – Role-based Export Rights to the PDM

- Standard catalog - cyan
  Use whenever possible. Standard parts are available from many suppliers at best quality, price and shortest delivery time

- Preferred catalog green
  There is a business relationship and supplier evaluation

- Catalog yellow
  There is a vendor in the system, but e.g. no contracts for delivery security

- Catalog red
  The catalog is provided. It can be researched and locally exported.
System process
C product system with and without PARTsolutions

Expenses for creating the data

Meta-data: e.g. X,Y,Z volume weight, texts in foreign language, project assignment, laboratory / office target layer small-scale production / series production, material type

C product system without PARTsolutions

1. Download geometry from the Internet
2. Import geometry into NX CAD
3. Standardize geometry in NX
4. Create document in the PDM and register file
5. Check document in PDM and release
6. Create material in PDM
7. Connect material and document

C product system with PARTsolutions

One step incl. filling of metadata

C product created
Usable in CAD assembly group and material parts list
Standard and catalog parts in the WITTENSTEIN PLM landscape

Creation of PDM objects Document, Material and assignment to Project
Numbers, data and facts
Standard and catalog parts in the WITTENSTEIN PLM landscape

Statistical data for C products imported into Agile

Catalog projects 112 + 1 for parts from “red” catalogs 155 objects included
Target no longer offer all catalogs – via the evaluation of search frequency

Parts from catalog

- No vendor
- PSOL catalog vendor

Use

- Small-scale production
- Large-scale production

Material Freigabe C-Teile aus PSOL
Product data quality: Numbers Data Facts
Material and C products in Agile PDM

Materials
- 21298 created
- 16839 released
- In business year 2016/2017

Purchase and & standard parts
- 1821 created
- In business year 2016/2017
- > 30,000 data records total
Improving product data quality: Action fields

- Provide standard and purchase parts catalog for the construction, existing and newly added parts in the system thus have a high data technical standard. Duplicates are avoided and preferred parts are used. Follow-up benefits in the value-adding activities cycle.

- Prepare data for initial loading (for existing PDM data) manually, semi-automatically through software / rules or as “offline” service, data withdrawal, preparation, replay.

- Introduce classification / catalog of names / keyword search, semantic and geo-semantic expression possible. For existing and new parts. The benefit for semantic and geometric analysis is currently being tested. See also the following slide.
Automatic naming of C products
No uniform rules for the formation of designations

For example with screws:
• Clear name, Standard/Manufacturer/Brand, Standard no., Nominal diameter, Nominal length

Screw ISO 7380-2 M4x20
Screw ISO4762 M12x120 12.9
Screw ISO4762-M4x12-10.9...
Screw ST4.8x9.5-ISO7049-C...

No specification to ensure master data quality for standard / catalog part & auxiliary and operating materials (product-related)

No coordinated procedure to ensure that the data records are up-to-date (e.g. if the standard DIN 912 changes to DIN EN ISO 4762)

Large amount of records with inconsistent field entries

Naming rules

> 180 rules of thumb

Only for screws

(2652 data records)
### Action field automatic standard part naming

Necessary preliminary work: Definition of assignments (excerpt)

<table>
<thead>
<tr>
<th>zutreffende Norm/Applicable standard</th>
<th>Klarnamende/Clear name de</th>
<th>Syntax Materialkurztext/Syntax material short text</th>
<th>Technischer Teil/Technical Part</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIN 4762, EN 4014, ISO 4017</td>
<td>Schraube Screw</td>
<td>&quot;&lt;Klarname&gt;&quot; &quot;&lt;Produktnorm&gt;&quot; &quot;&lt;Gewindegröße&gt;&quot; &quot;&lt;Nennlänge&gt;&quot; &quot;&lt;Festigkeitsklasse&gt;&quot;</td>
<td>&quot;&lt;Klarnamenteil/Clear name part&gt;&quot; &quot;&lt;Produktnorm&gt;&quot; &quot;&lt;Gewindegröße&gt;&quot; &quot;&lt;Nennlänge&gt;&quot; &quot;&lt;Festigkeitsklasse&gt;&quot;</td>
</tr>
</tbody>
</table>
Standard and catalog parts in the WITTENSTEIN PLM landscape

Action field automatic standard part naming

- Assignment of standard to a CADENAS standard project - WSE TSC standardization
- Short and long naming - Clear name + parameters in German and English PI
- Length limitation of document 30 characters short text 130 characters long text (title block – ERP systems)
- Length limitation of material 30 characters short text 255 characters long text (basic data text SAP)
- The material long text is the template for the purchase order text

Example  ISO 4762 \rightarrow CADENAS catalog project din_en_iso_4762

| Plain name | Screw |
| Material short text | Screw ISO4762 M8x60 12.9 Screw ISO4762 M8x60 12.9 |
| Basic data text | Hexagon socket head cap screw ISO 4762 - M8 x 60 - 12.9 Hexagon socket head cap screw ISO 4762 - M8 x 60 - 12.9 |
Standard and catalog parts in the WITTENSTEIN PLM landscape

Action field automatic naming

• Result in Agile PDM example purchase part – article number and catalog info appear in basic data text

• Document

• Material
What happens next with C products at WSE

Field of action initial loading – product data cleaning

- Until today no initial loading has been done
- Successful proof of concept with CADENAS and D&TS in 2018 for an in-house part and a C product category
- The in-house parts catalog was approached with this in mind
- Objective is complete classification of C products and in-house parts in the PDM via PARTsolutions if necessary
  - Jump from manufacturer catalog to standard part catalog, if standard catalog is available.
  - Order number can be generated. Today WSE custom solution
  - Nightly update from ERP system to LinkDb in PARTsolutions
- Automatic Classification / Commodity Code
- CADENAS is requested here: For standard parts, add strength and coating, in this way complete
First results for in-house parts catalog and classification
Conclusion

- Selection of C product solution
- Standard and catalog parts in the WITTENSTEIN PLM landscape - infrastructure - preferred catalogs
- Material creation process for standard and C products
- Product data quality: numbers, data, facts and action fields
- Outlook - Field of action automatic standard part naming
- Outlook - Field of action initial loading - product data cleaning

- Gradually integrate user preferences, e.g. eliminate multiple necessary selections.
Thank you for your interest