WABCO

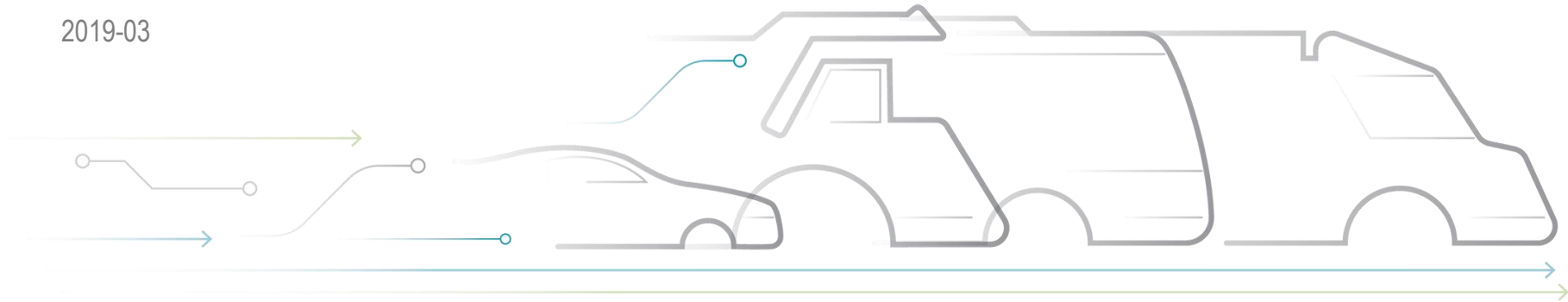
Mobilizing Vehicle Intelligence

IMPLEMENTATION OF CADENAS GEOSEARCH IN THE WABCO DEVELOPMENT PROCESS

Olaf Hilla

TEAM LEADER MECHANICAL DESIGN TECHNOLOGY

2019-03



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WABCO Confidential and Proprietary

PRESENTER

Olaf Hilla, WABCO

- University of Hannover, Dipl.-Ing. Mechanical Engineering
- Since 1998 at WABCO GmbH in Hanover
- Team Leader “Mechanical Design Technology”, Expertise:
  - Design Reviews
  - Standard Part Management, Standardization
  - Design and verification of screw joints (VDI 2230)
  - Geometric Product Spezifikation ISO 14638 (drawing quality)
  - Competence Center for Sealing Technology

ABOUT WABCO: THE INDUSTRY'S TECHNOLOGY INNOVATOR

WABCO is a leading global supplier of technologies and services that improve the **safety, efficiency and connectivity** of commercial vehicles.

Founded nearly **150 years** ago, WABCO continues to pioneer breakthrough innovations for advanced driver assistance, braking, stability control, suspension, transmission automation and aerodynamics.

In 2017:

$3.3B Annual revenues

15.000 Employees in 40 countries

10 Years NYSE listing

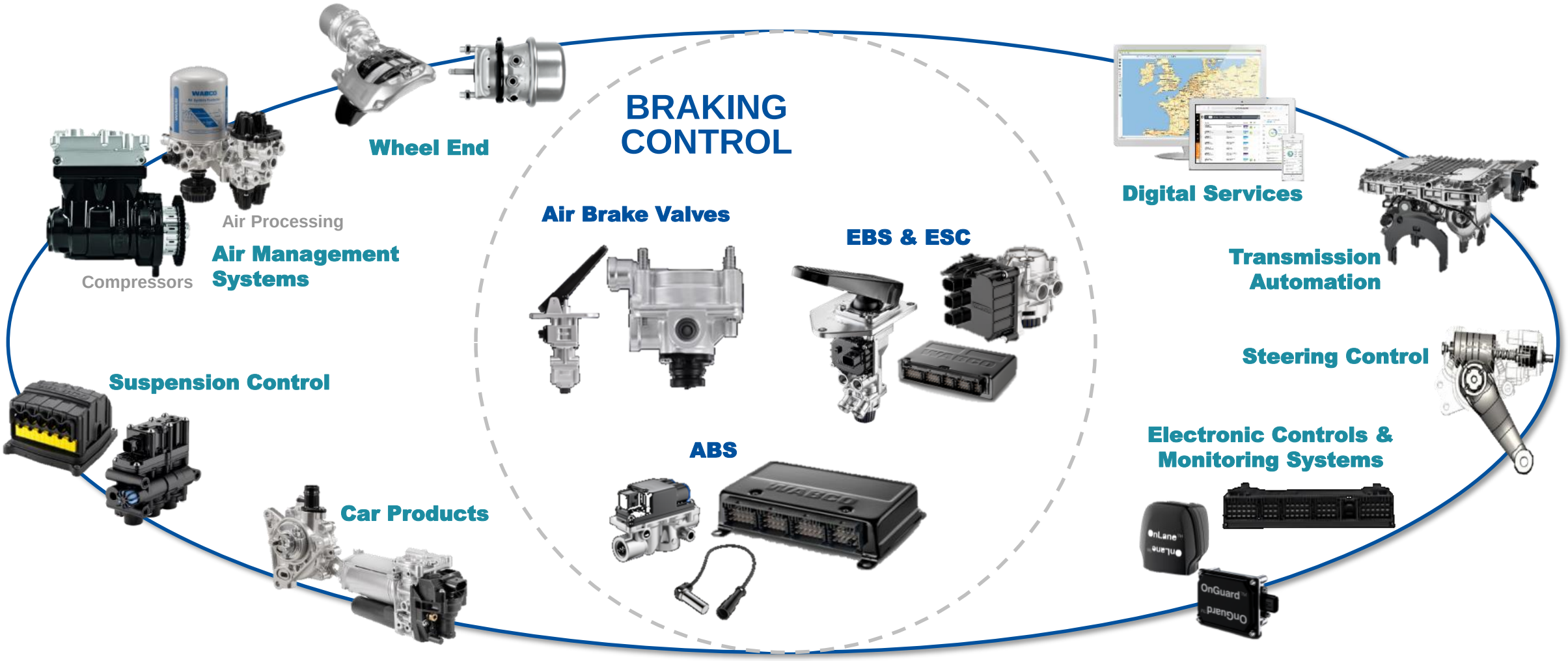
27 Factories, 3 Test tracks

2.600 Engineers worldwide

383 Patents granted

All figures relate to 2017 unless stated

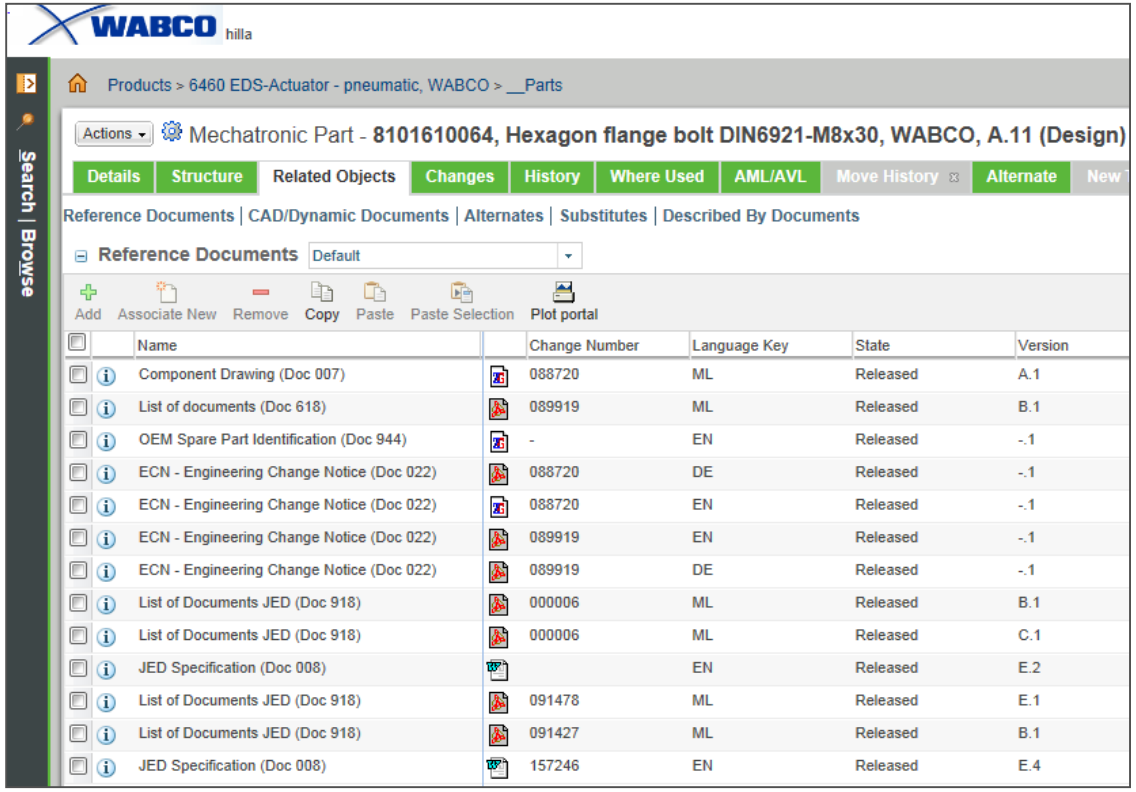
A RICH PORTFOLIO OF TECHNOLOGIES



CAD/PDM ENVIRONMENT

PLM contains all CAD data, technical documentation / process workflows

- CAD-system CREO (PTC)
- Windchill PLM (PTC)
  - All part numbers, organized in product groups with defined user roles
  - All documents of a part no. that are relevant for its release
  - Release status and tech. attributes are associated to part numbers
  - Control of release and other workflows
  - “Request new standard part”-workflow

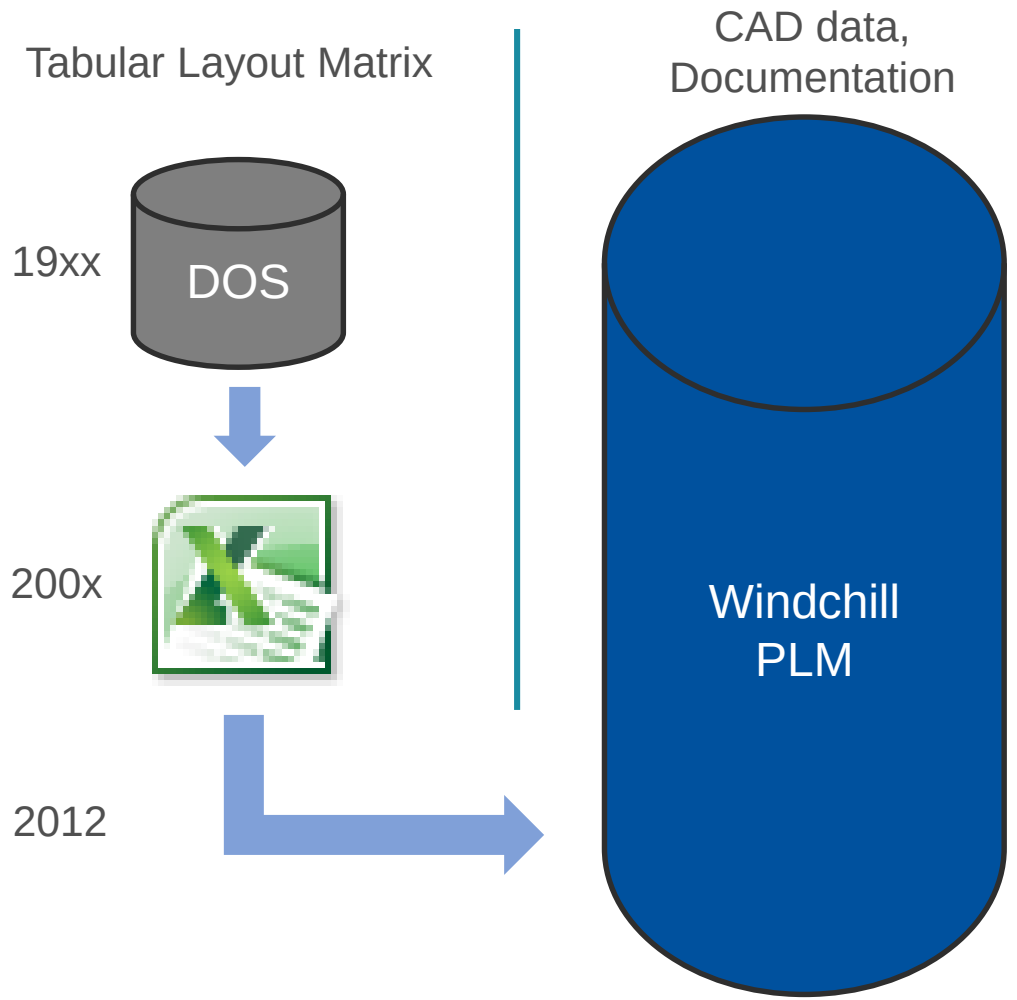


Name	Change Number	Language Key	State	Version
Component Drawing (Doc 007)	088720	ML	Released	A.1
List of documents (Doc 618)	089919	ML	Released	B.1
OEM Spare Part Identification (Doc 944)	-	EN	Released	-.1
ECN - Engineering Change Notice (Doc 022)	088720	DE	Released	-.1
ECN - Engineering Change Notice (Doc 022)	088720	EN	Released	-.1
ECN - Engineering Change Notice (Doc 022)	089919	EN	Released	-.1
ECN - Engineering Change Notice (Doc 022)	089919	DE	Released	-.1
List of Documents JED (Doc 918)	000006	ML	Released	B.1
List of Documents JED (Doc 918)	000006	ML	Released	C.1
JED Specification (Doc 008)		EN	Released	E.2
List of Documents JED (Doc 918)	091478	ML	Released	E.1
List of Documents JED (Doc 918)	091427	ML	Released	B.1
JED Specification (Doc 008)	157246	EN	Released	E.4

STANDARD PART MANAGEMENT

History of the standard part management

- History: DOS-database -> Excel-listes (75.000 documented parts)
- 2012: Classification and Tabular Layout Matrix adopted to DIN 4000 and uploaded into PLM
  - Only *relevant* standard parts were classified (only purchased parts; approx. 8.000 Teile)
  - Classification in two levels (Main class/Sub class)
  - Material and surface protection already existed as attributes in PLM



STANDARD PART MANAGEMENT

Example for classification attributes in PLM

Classification

Techn. attributes

er	Name	Part Standard	State	Part Class 1	Part Class 2	Material	Material Surface Protection	A1	B	C	D
00874	Cheese Head Screw	ISO4762 sim	Released	screw	metric	JED-051M6	JED-371-1	M8	30.00	28.00	
80394	Cheese head screw...	DIN6912	Released	screw	metric	JED-051M4	JED-256-0	M8	30.00	23.00	
50194	Cheese head screw...	DIN7984	Released	screw	metric	JED-051M4	JED-256-0	M8	30.00	22.00	
19514	Cheese head screw I...	ISO4762 / DIN912 sim	Released	screw	metric	Steel	JED-257-0	M8	30.00	26.30	
00264	Cheese head screw I...	ISO4762 / DIN912	Released	screw	metric	JED-051M4	JED-256-0	M8	30.00		
01994	Cheese head screw I...	ISO4762	Released	screw	metric	JED-051M6	-	M8	30.00	25.83	
02484	Cheese Head Screw...	DIN 6912	Released	screw	metric	JED-051M5	JED-247-0	M8	30.00	23.00	
30774	Countersunk head sc...	ISO2009 / DIN963	Released	screw	metric	JED-051M4	JED-256-0	M8	30.00	22.85	

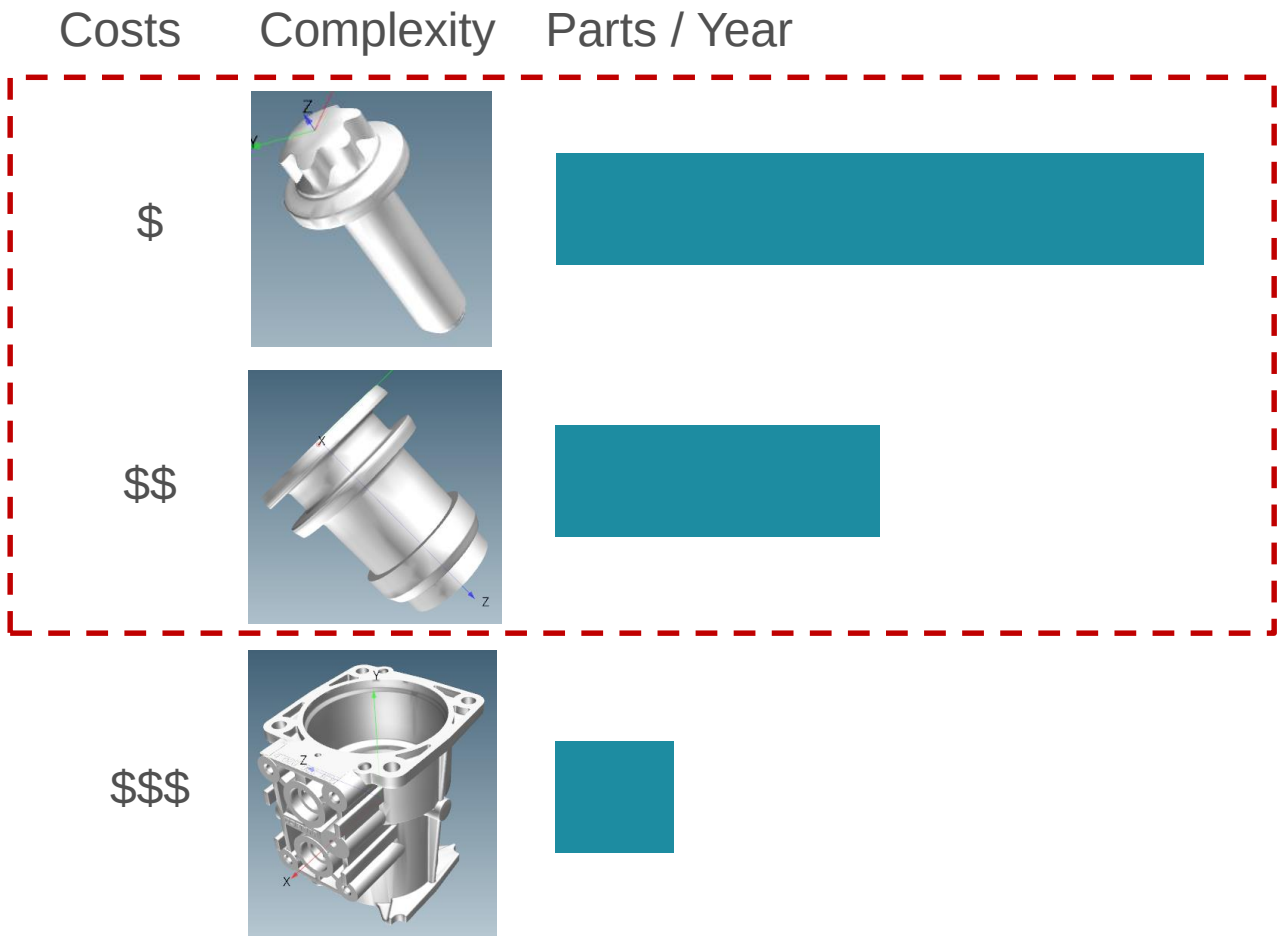
IMPLEMENTATION OF GEOSEARCH

Reason for GEOsearch/ “User pains”

- Unknown saving potential by increased re-use of parts
- No opportunity to find similar parts in PLM

Method for Business Case

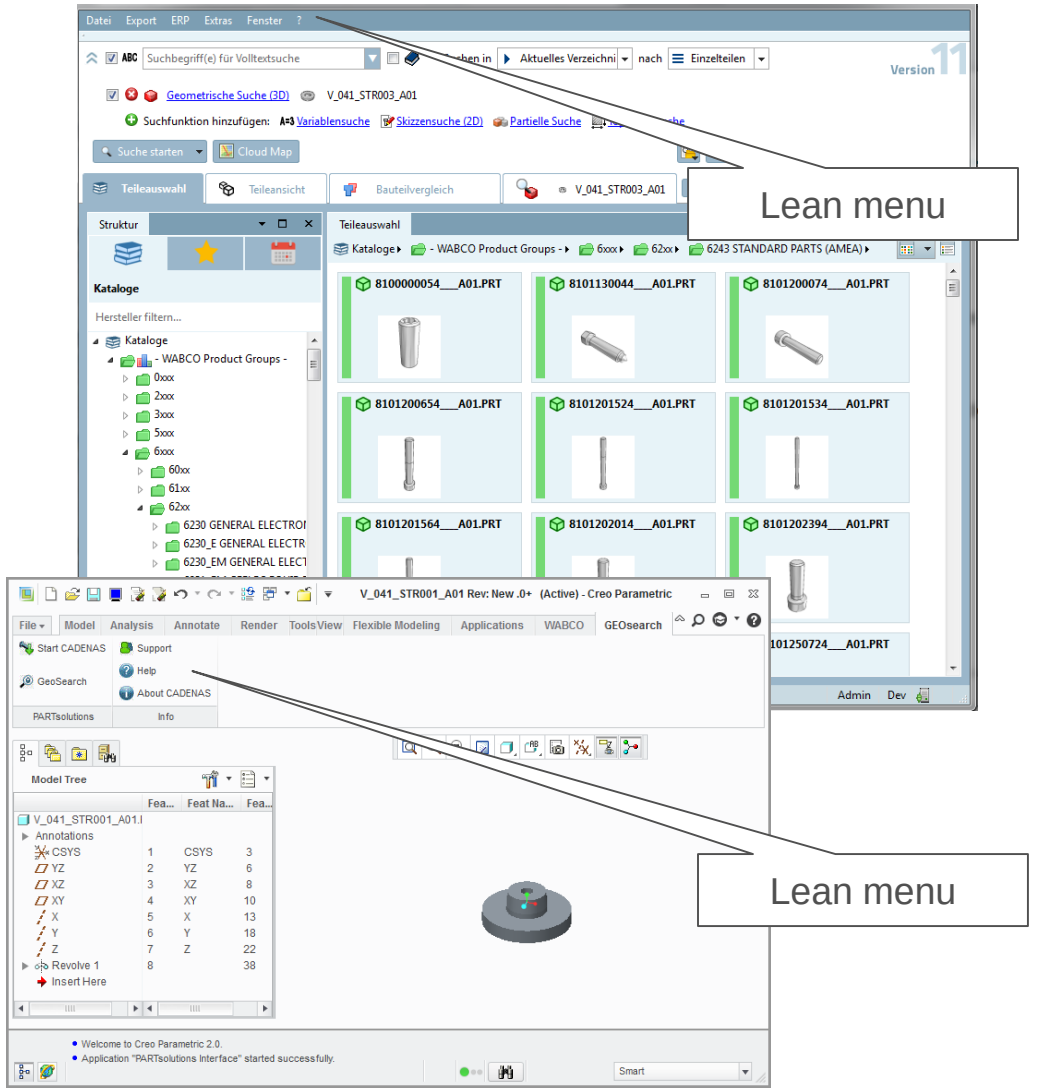
- Analyse/categorizazion of parts created within one year
- Estimation of development costs and tooling costs per category
- Estimation of the potentially increased re-use



IMPLEMENTATION OF GEOSEARCH

Implementation Strategy

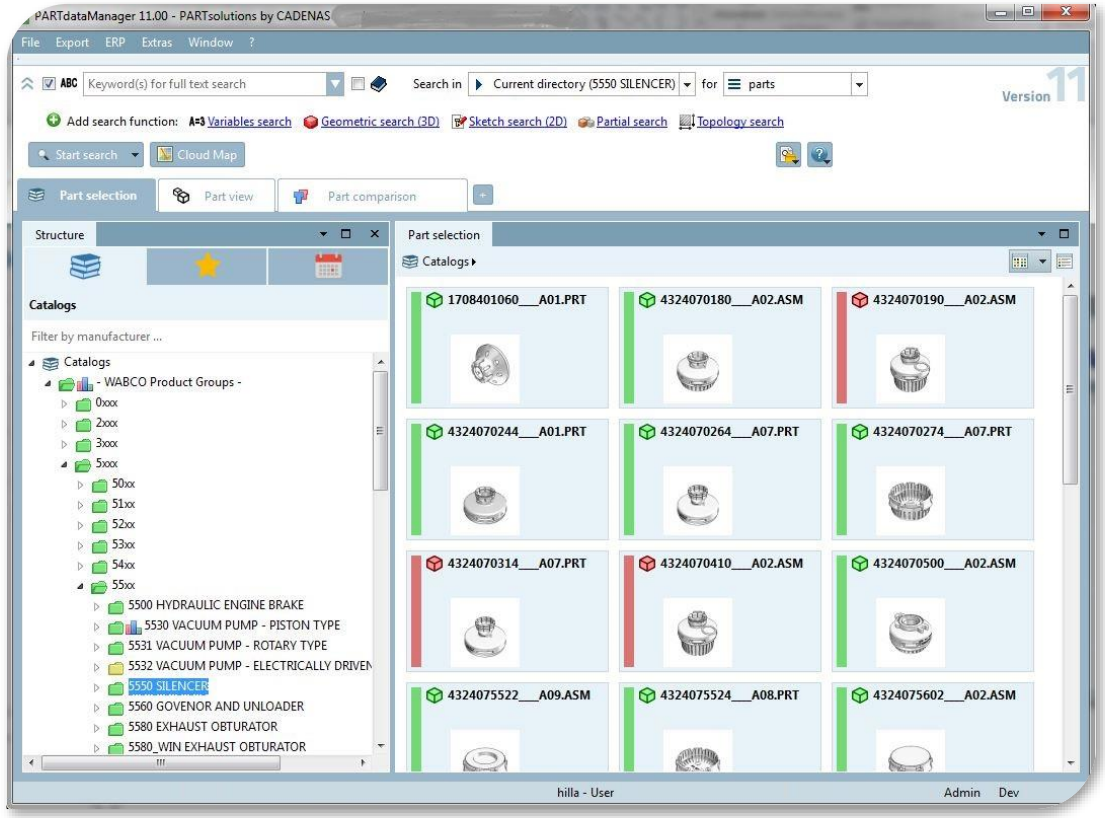
- Which models to be imported?
  - Exclusion criteria: e.g. „no prototypes“, „no assembly state“
  - 80.000 imported models (15% of existing 3D-models)
- Catalogue structure
  - No supplier catalogues (enforce re-use of existing parts)
  - Product Group structure
- Who can use GEOsearch?
  - All CREO users (300)



PART PORTFOLIO MANAGEMENT

Organized in Product Groups

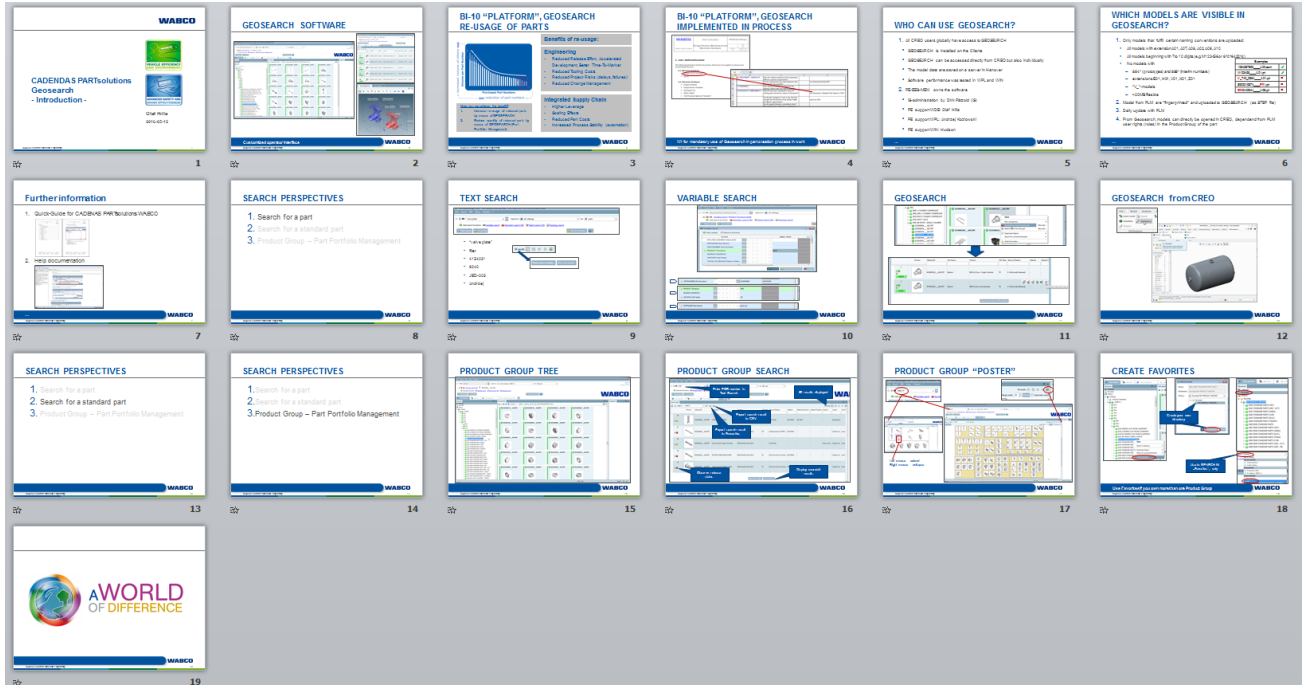
- Pre-GEOsearch: No way to intuitively / visually analyze the part portfolio
- Show Product Groups as catalogues
- Traffic lights (preferred parts, "Not-for-new-design")
- Import classification attributes of standard parts from PLM



IMPLEMENTATION OF GEOSEARCH

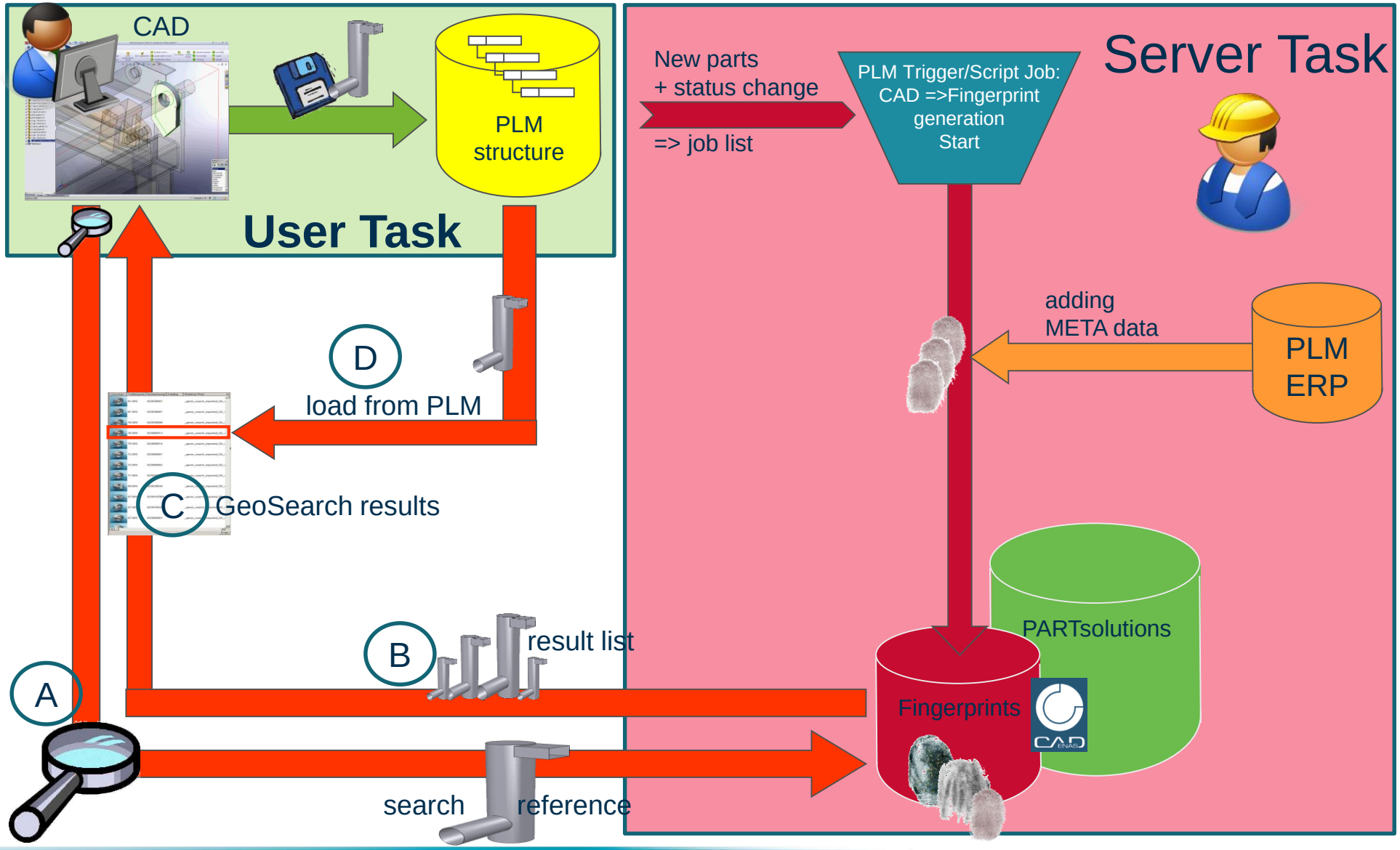
Implementation effort

- Project
  - Kick-Off Workshop with CADENAS, end of 2015
  - Installation and customizing, „several weeks“
  - Importing 3D-models, ~3 months
  - Preparation of training materials
- Roll-Out
  - Official release in 2016 (inform users)
  - Conduct global trainings



training material

GEOMETRICAL SEARCH WITH CAD/PLM, USER & SERVER WORKFLOW

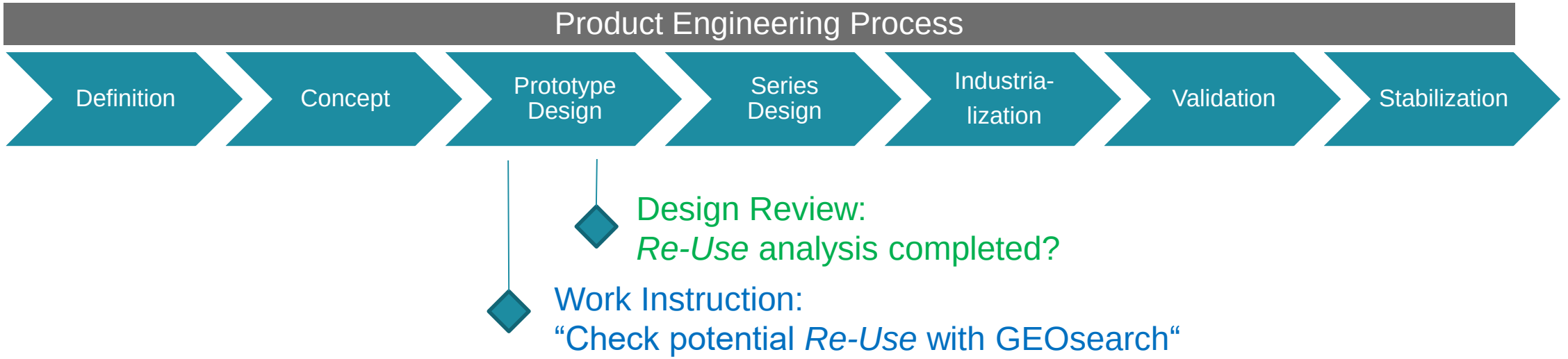


[from CADENAS]

WABCO

NEW TOOL = NEW PROCESS

Implementation of GEOsearch/“Re-Use” into the WABCO Product Engineering Process



+ Key Performance Indicator (KPI): Monthly analysis of all devices with new prototype release (ratio of „re-use of parts /all parts“)

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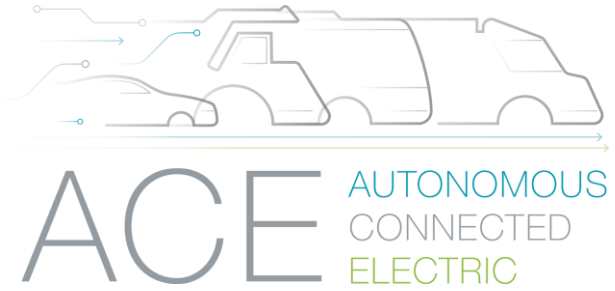
Mobilizing Vehicle Intelligence

THANK YOU