



GE Oil & Gas Part Catalogs Management

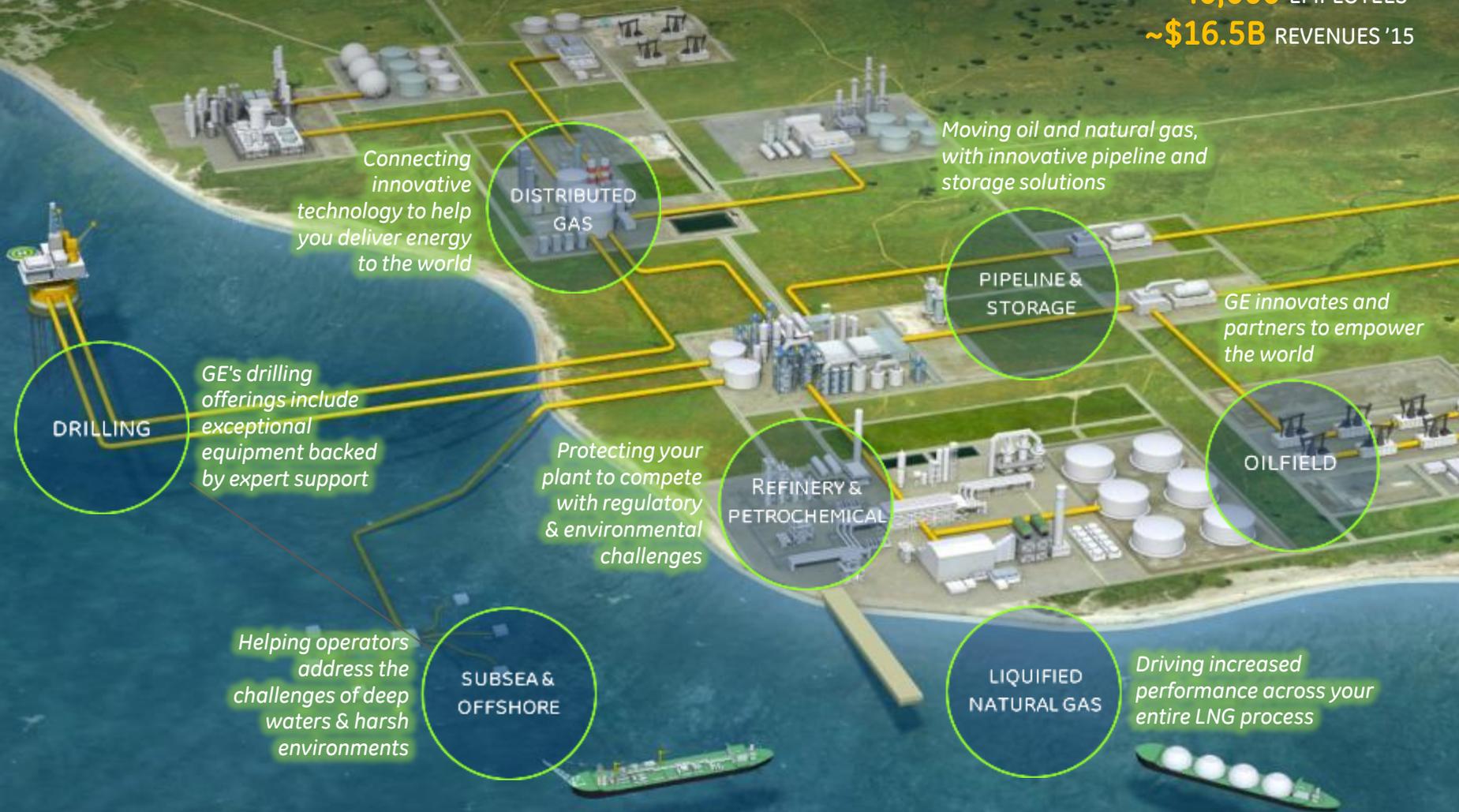
Nicola Campo

March 8th 2016

Imagination at work

We provide cutting edge technology and service solutions throughout the value chain

~40,000 EMPLOYEES
~\$16.5B REVENUES '15



IMPROVING THE HEALTH & PRODUCTIVITY OF YOUR OPERATIONS FROM EXTRACTION TO END USE

AGENDA

- Business Case
- From a paper based approach... to digital catalogs
- What's Next
- Lesson Learned



Business Case



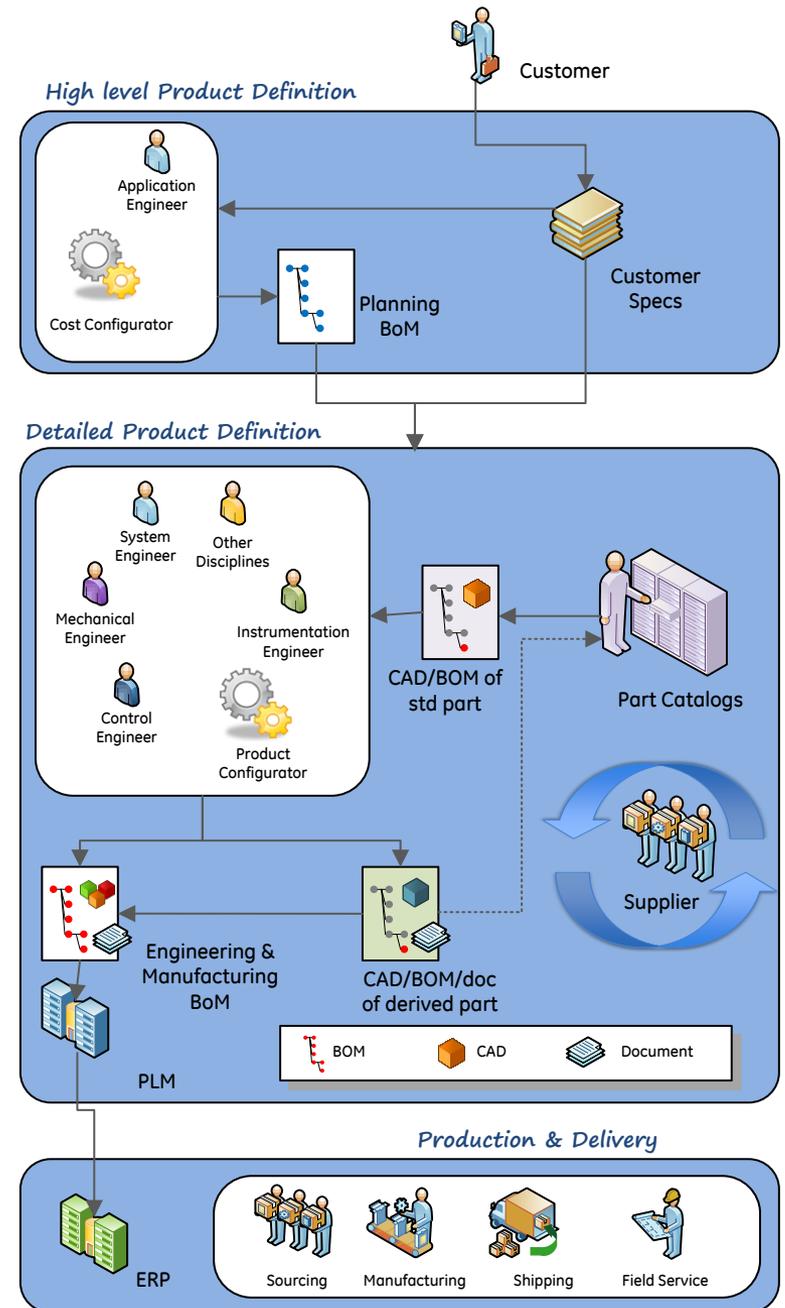
The Oil & Gas context

Engineering-to-order... increasing complexity of Customer requirements

Product variations continuously growing

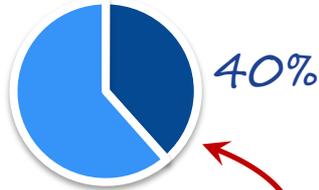
High variability of disciplines and design tools in a global environment

Continuous demand for shorter lead time and lower costs



Problem Statement

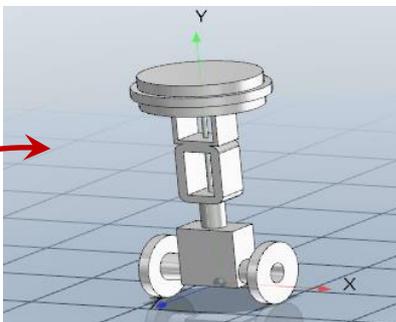
Standardized & commercial parts



VALVE DATA SHEET			
Q	1	ITEM	
R	2	MODEL	
S	3	QUANTITY	1
T	4	SERVICE	SEAL GAS FLOW CONTROL
U	5	PIECE SIZE	SCHEDULE
V	6	FLUID	MIN. * 20 MAX. * 80
W	7	FLUID	SEALING
X	8	FLUID	
Y	9	SEALANT TEMP. °C	
Z	10	SEALANT TEMP. °F	
AA	11	SEALANT TYPE	
AB	12	SEALANT AT OPER. COND.	
AC	13	SEALANT VISCOSITY, cP	
AD	14	COMPRESSIBILITY	
AE	15	SEALANT VISCOSITY, cP	
AF	16	SEALANT VISCOSITY, cP	
AG	17	SEALANT VISCOSITY, cP	
AH	18	SEALANT VISCOSITY, cP	
AI	19	SEALANT VISCOSITY, cP	
AJ	20	SEALANT VISCOSITY, cP	
AK	21	SEALANT VISCOSITY, cP	
AL	22	SEALANT VISCOSITY, cP	
AM	23	SEALANT VISCOSITY, cP	
AN	24	SEALANT VISCOSITY, cP	
AO	25	SEALANT VISCOSITY, cP	
AP	26	SEALANT VISCOSITY, cP	
AQ	27	SEALANT VISCOSITY, cP	
AR	28	SEALANT VISCOSITY, cP	
AS	29	SEALANT VISCOSITY, cP	
AT	30	SEALANT VISCOSITY, cP	
AV	31	SEALANT VISCOSITY, cP	
AW	32	SEALANT VISCOSITY, cP	
AX	33	SEALANT VISCOSITY, cP	
AY	34	SEALANT VISCOSITY, cP	
AZ	35	SEALANT VISCOSITY, cP	
BA	36	SEALANT VISCOSITY, cP	
BB	37	SEALANT VISCOSITY, cP	
BC	38	SEALANT VISCOSITY, cP	
BD	39	SEALANT VISCOSITY, cP	
BE	40	SEALANT VISCOSITY, cP	
BF	41	SEALANT VISCOSITY, cP	
BG	42	SEALANT VISCOSITY, cP	
BH	43	SEALANT VISCOSITY, cP	
BI	44	SEALANT VISCOSITY, cP	
BJ	45	SEALANT VISCOSITY, cP	
BK	46	SEALANT VISCOSITY, cP	
BL	47	SEALANT VISCOSITY, cP	
BM	48	SEALANT VISCOSITY, cP	
BN	49	SEALANT VISCOSITY, cP	
BO	50	SEALANT VISCOSITY, cP	
BP	51	SEALANT VISCOSITY, cP	
BQ	52	SEALANT VISCOSITY, cP	
BR	53	SEALANT VISCOSITY, cP	
BS	54	SEALANT VISCOSITY, cP	
BT	55	SEALANT VISCOSITY, cP	
BU	56	SEALANT VISCOSITY, cP	
BV	57	SEALANT VISCOSITY, cP	
BW	58	SEALANT VISCOSITY, cP	
BX	59	SEALANT VISCOSITY, cP	
BY	60	SEALANT VISCOSITY, cP	
BZ	61	SEALANT VISCOSITY, cP	
CA	62	SEALANT VISCOSITY, cP	
CB	63	SEALANT VISCOSITY, cP	
CC	64	SEALANT VISCOSITY, cP	
CD	65	SEALANT VISCOSITY, cP	
CE	66	SEALANT VISCOSITY, cP	
CF	67	SEALANT VISCOSITY, cP	
CG	68	SEALANT VISCOSITY, cP	
CH	69	SEALANT VISCOSITY, cP	
CI	70	SEALANT VISCOSITY, cP	
CJ	71	SEALANT VISCOSITY, cP	
CK	72	SEALANT VISCOSITY, cP	
CL	73	SEALANT VISCOSITY, cP	
CM	74	SEALANT VISCOSITY, cP	
CN	75	SEALANT VISCOSITY, cP	
CO	76	SEALANT VISCOSITY, cP	
CP	77	SEALANT VISCOSITY, cP	
CQ	78	SEALANT VISCOSITY, cP	
CR	79	SEALANT VISCOSITY, cP	
CS	80	SEALANT VISCOSITY, cP	
CT	81	SEALANT VISCOSITY, cP	
CU	82	SEALANT VISCOSITY, cP	
CV	83	SEALANT VISCOSITY, cP	
CW	84	SEALANT VISCOSITY, cP	
CX	85	SEALANT VISCOSITY, cP	
CY	86	SEALANT VISCOSITY, cP	
CZ	87	SEALANT VISCOSITY, cP	
DA	88	SEALANT VISCOSITY, cP	
DB	89	SEALANT VISCOSITY, cP	
DC	90	SEALANT VISCOSITY, cP	
DD	91	SEALANT VISCOSITY, cP	
DE	92	SEALANT VISCOSITY, cP	
DF	93	SEALANT VISCOSITY, cP	
DG	94	SEALANT VISCOSITY, cP	
DH	95	SEALANT VISCOSITY, cP	
DI	96	SEALANT VISCOSITY, cP	
DJ	97	SEALANT VISCOSITY, cP	
DK	98	SEALANT VISCOSITY, cP	
DL	99	SEALANT VISCOSITY, cP	
DM	100	SEALANT VISCOSITY, cP	

Based on smart codes

CAD



- Metadata and transactional data not available for part search/selection
- Manual and cumbersome process to Search/Create standard parts in PLM (BoM and CAD)
- Classification in PLM cannot manage complex rules to generate smart codes... need to create upfront all potential instances

Project Goal

Parts selection and creation time reduction and data reuse increase



Project goal

In scope

- Full Text Search
- Attribute Search
- Geometrical Search
- Teamcenter® Integration
- Add BOM item in existing BOM structure
- Add CAD Model in existing assembly
- BOM Code Creation
- Automatic Classification

Out of scope

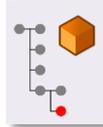
- Other Integrations
- Custom design Part Selection
- Custom design Part Creation



From a paper based
approach...
to digital catalogs



From a paper based approach...



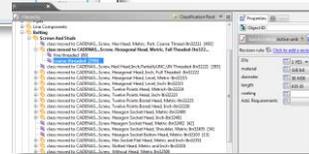
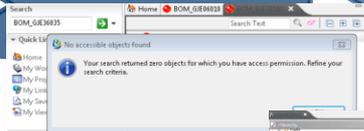
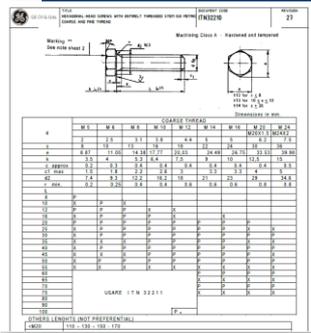
Standard Document
Builds the code reading the standard document

PLM search
Searches the BOM Code in Teamcenter® (and the corresponding CAD Model if needed)

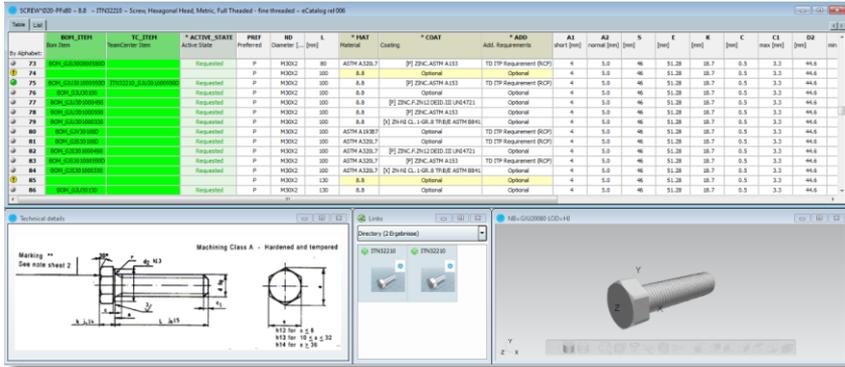
BoM management
Uses the BOM code if present (and the CAD Model where applicable)

New BoM code creation
If not present in Teamcenter creates a new BOM Code using Teamcenter® Classification

CAD management
Requests to admin to create a Part Family member in NX®



...to Digital Catalogs



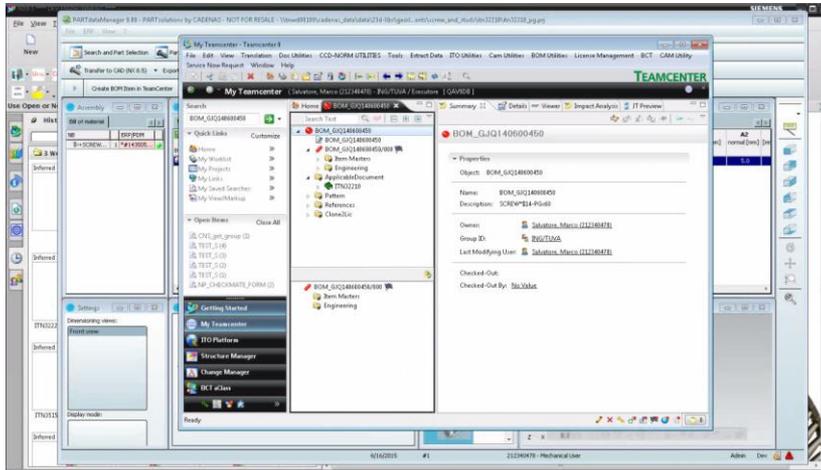
- All standardized & commercial codes managed through a rule engine
- Functional Searches (based on Attributes)
- Geometrical Searches
- Geometric/Metadata Part Comparison
- BOM and CAD model Description dynamically created

The Designer searches for a component starting from its attributes and, if never used before, creates BOM code and CAD Model in one click

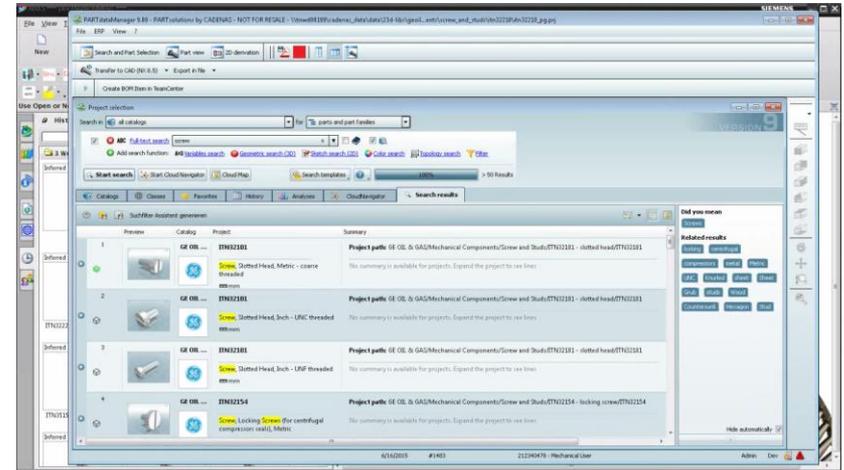


Demo Video

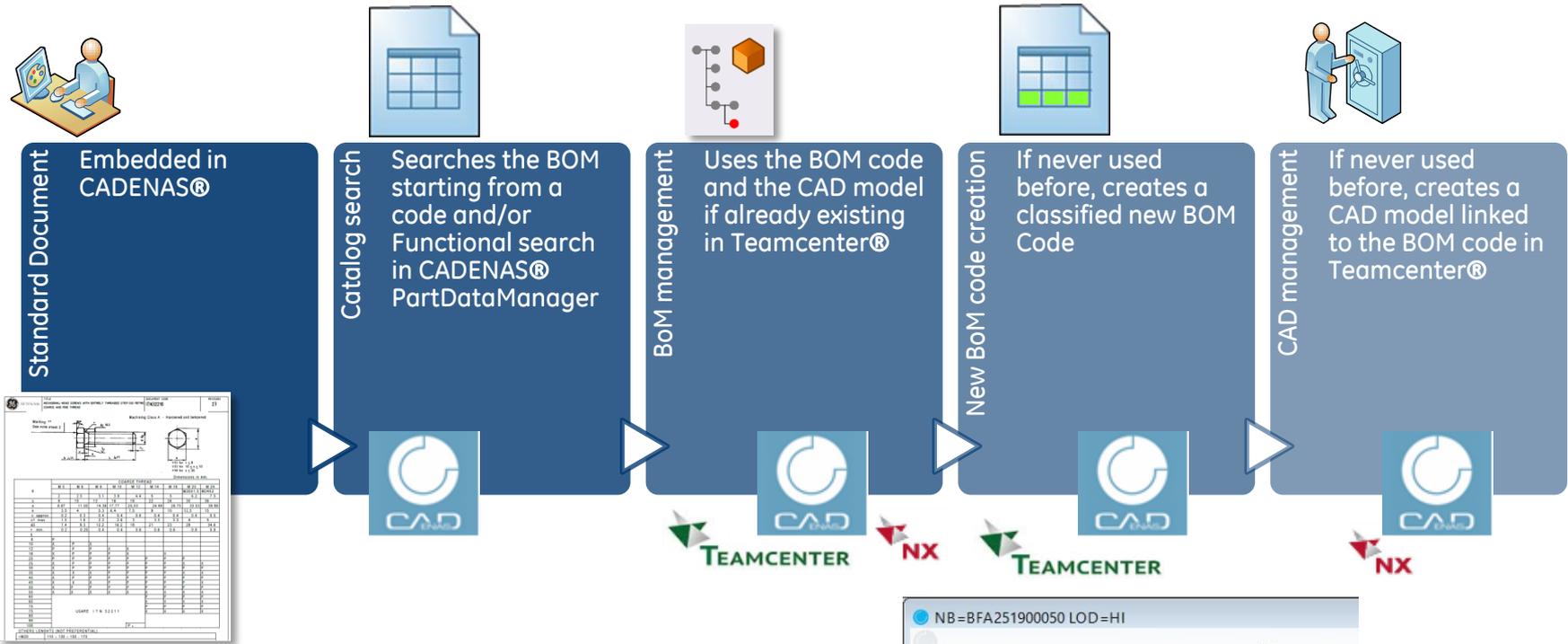
BOM code creation



Functional search



To-be process overview



Technical drawing showing a cross-section of a part with dimensions and a BOM table below it.

BFA251900050							
Table		List					
	PREF Preferred	* MAT Material	S Exagon [...]	TOLL Toll. [mm]			
20	P	[P] S235JRC EN 10277-2 (Fe360B)	19.0	0/-0,13	2,45	50	ITN14113_007_A_001.pdf

3D CAD model of a part in a coordinate system (X, Y, Z). The part is a rectangular block with a slanted top surface. The coordinate system is shown with X, Y, and Z axes.



Benefits



Engineering productivity to search and create standard parts



Data consistency for parts generated through a rule engine



Automatic classification (metadata and geometric) enabling similarity searches



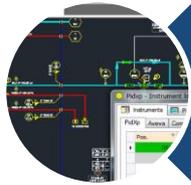
Enables future scenarios of data federation from external databases



What's Next



The road to a Strategic Part Selection process



AVEVA® Instrumentation Interface – to create Instrumentation datasheet starting from a Digital Catalog



Rulestream® Interface – to configure complex systems starting from classified Standard components



A new Part Selection Process based on information coming from different data sources (supporting “informed decisions”)... **data federation**



Enable part selection process for “Derived Codes”, including creation and management of datasheets from templates



Lesson Learned



Lesson Learned



The transition between the old and the new process for Standard Components is critical (impossible to «turn the key» or plan a massive data migration)



The selection of an Out Of The Box solution doesn't mean it is painless... need to **customize** the software solution according to business requirements / existing processes / interfaces



Rigor of rules and conventions is a critical aspect when we speak about catalogs and classification (in terms of data meaning and classification structure)



It is difficult to accelerate the creation of part catalogues with a single partner with both IT skills and product knowledge

