Digital Factory
NEXT GENERATION

Mercedes-Benz Cars (MBC) Product Portfolio

MFA

A-Class
V/Z 177

B-Class
W 247

CLA-Class
C/X 118

GLA-Class
H 247

GLB-Class
X 247

MHA

GLE-Class
V/C 167

GLS-Class
X 167

MRA

C-Class
W/S/V 206

C-Class
A/C 205

E-Class
W/S/V 213

E-Class
A/C 238

CLS-Class
C 257

AMG GT
X 290

SUV

G-Class
W 463

S-Class
W/V/Z 223

GLC-Class
C/X 253

EVA

EQA
H 243

EQB
X 243

EQC
N 293

EQS
V 297

MSA

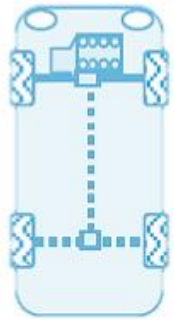
AMG GT
C/R 190

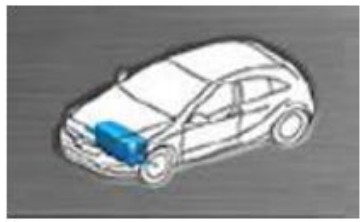
MFA	Mercedes Front-Wheel Architecture
MRA	Mercedes Rear-Wheel Architecture
MSA	Mercedes Sports Architecture
MHA	Mercedes High Architecture
SUV	Sport Utility Vehicle
EVA	Electric Vehicle Architecture
MMA	Mercedes Modular Architecture

Body Style			
W	Sedan / Hatchback / Sports Tourer	X	Special Version
V	Extended Sedan	S	Estate (Station Wagon)
A	Cabriolet (Convertible)	C	Coupé
H	City SUV (Crossover)	R	Roadster
		Z	Special Version

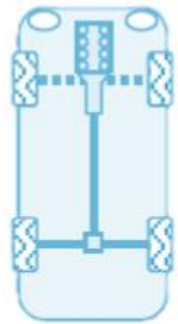
MBC Platform Architectures - ICE

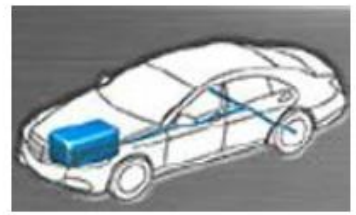
MFA — **M**ercedes **F**ront Wheel Drive **A**rchitecture



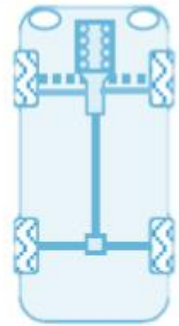


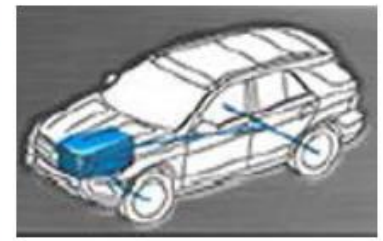
MRA — **M**ercedes **R**ear Wheel Drive **A**rchitecture





MHA — **M**ercedes **H**igh **A**rchitecture

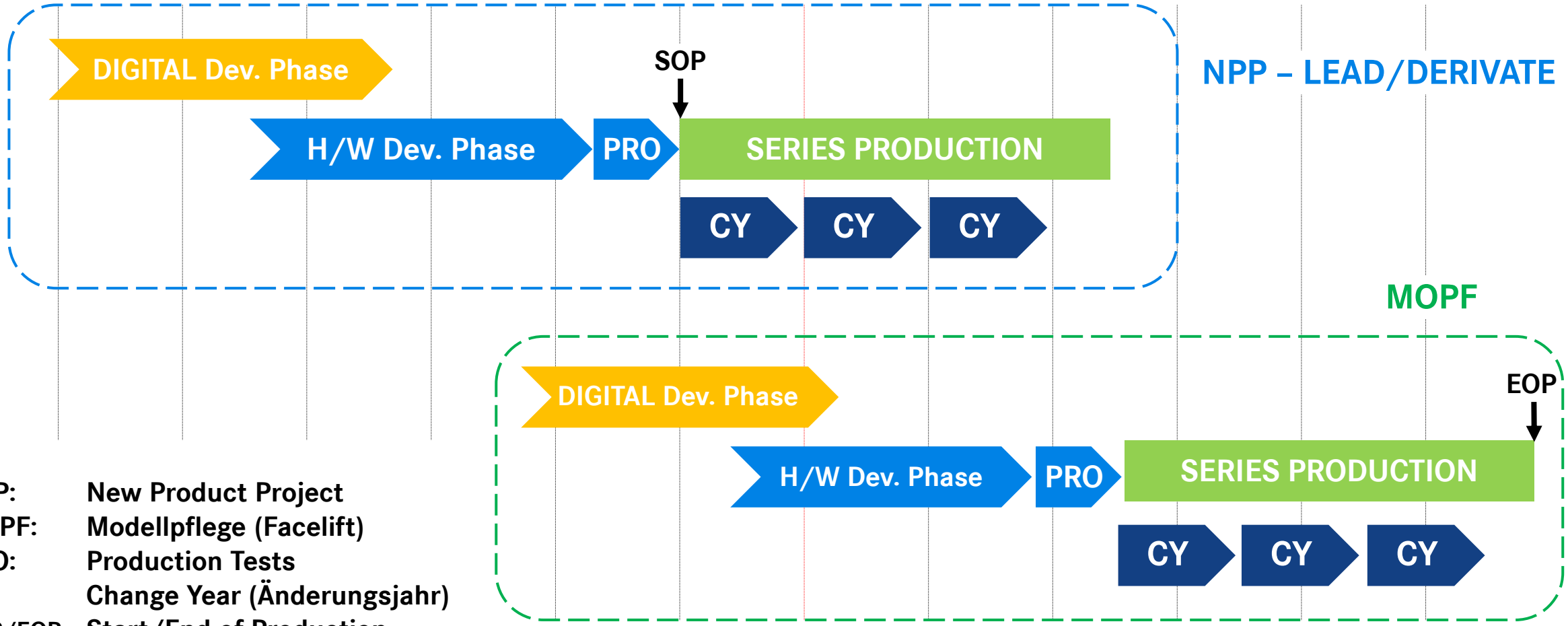




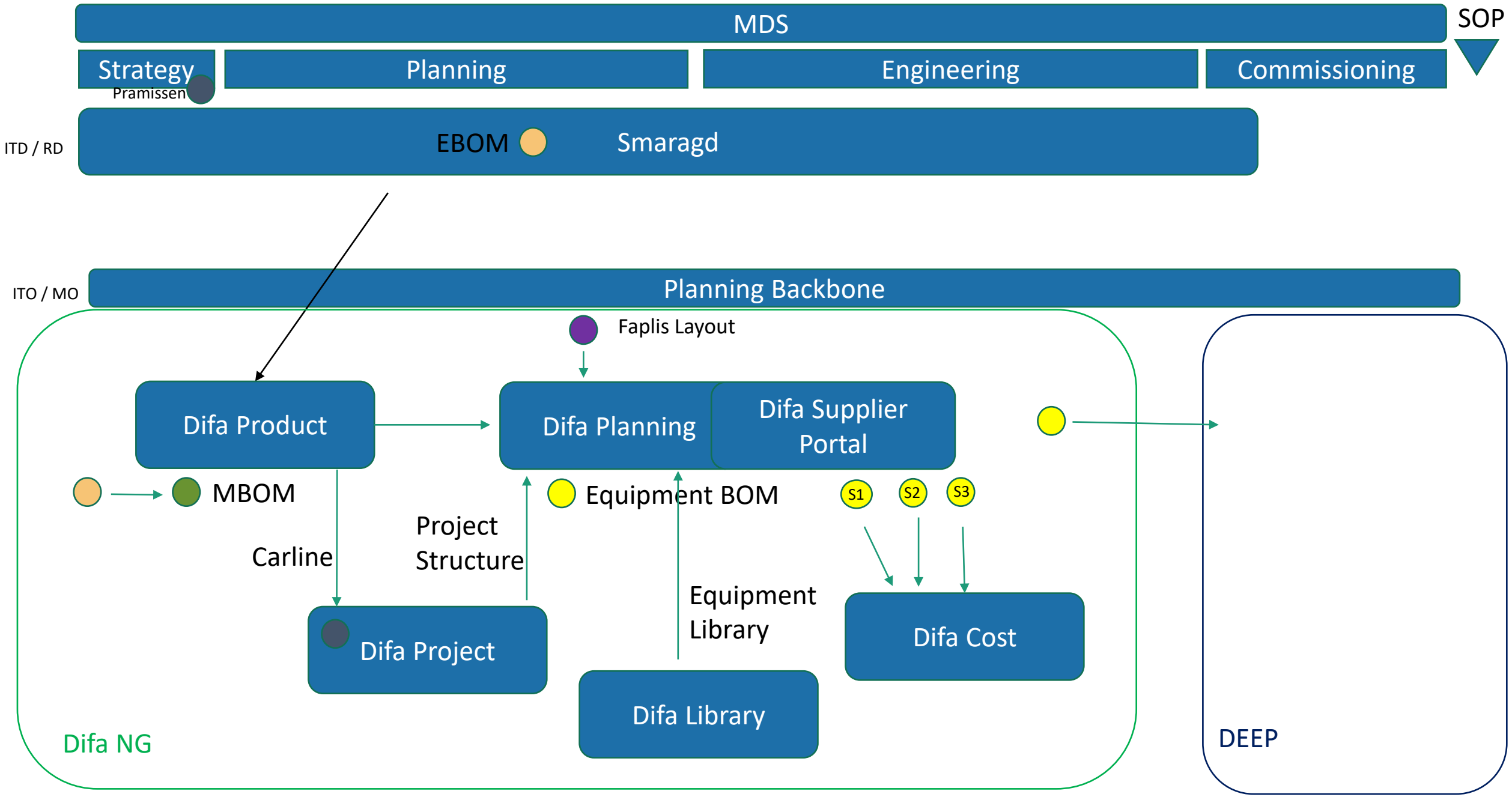
MDS

Defines WHO does WHAT, WHEN with WHOM & HOW – to create a new Mercedes vehicle

Vehicle Lifecycle – Phases of Development



NPP: New Product Project
MOPF: Modellpflege (Facelift)
PRO: Production Tests
CY: Change Year (Änderungsjahr)
SOP/EOP: Start/End of Production


MDS
SOP
Strategy
Planning
Engineering
Commissioning
Pramissen
ITD / RD
EBOM
Smaragd
ITO / MO
Planning Backbone
Faplis Layout
Difa Product
Difa Planning
Difa Supplier Portal
MBOM
Equipment BOM
S1
S2
S3
Carline
Project Structure
Equipment Library
Difa Project
Difa Cost
Difa Library
Difa NG
DEEP

A Brief History Of DiFa NextGeneration

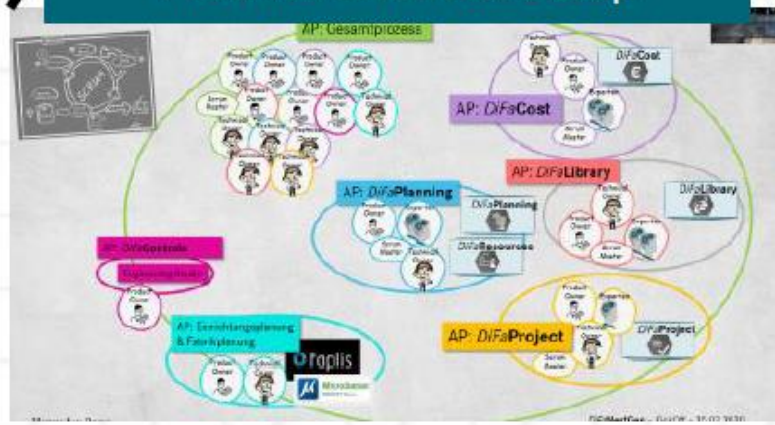
2015	2016	2017	2018	2019	2020	2021
			ASCon Systems The Digital Twin Company / NETALLIED SYSTEMS			
Benchmark	Proof-of-Concept	Development and Integration	Realization with ASCon Focus *DiFa***Product**		Focus *DiFa***Planning**	Roll-Out
SIEMENS		SIEMENS				

DASSAULT SYSTEMES

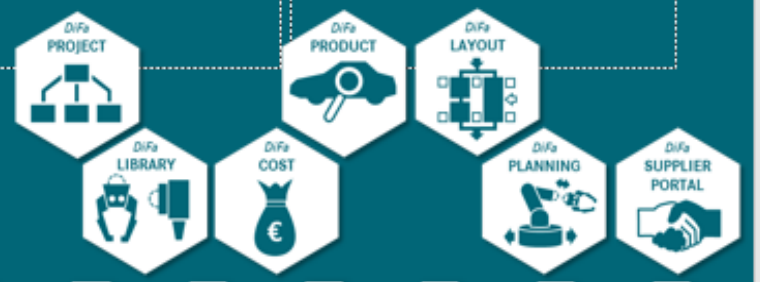
Why?

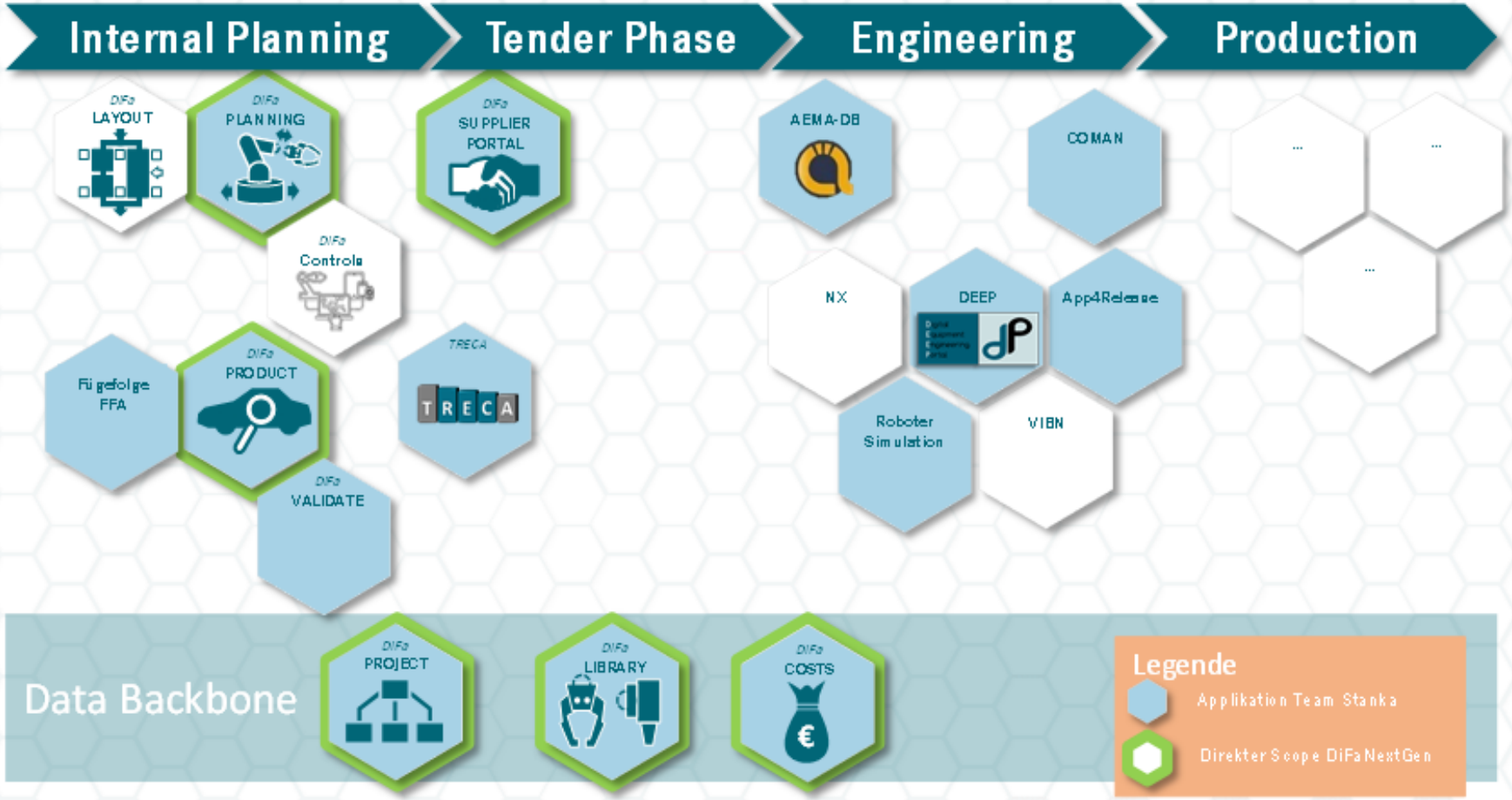
- Sun-Down Delmia v5 was announced in 2014
- Saving on running-costs > 1 M€ / year
- Allow suppliers to inquire without licensing costs
- Create modern system for data throughput and continuity
- Possibility for more efficient processes

Product-oriented Setup

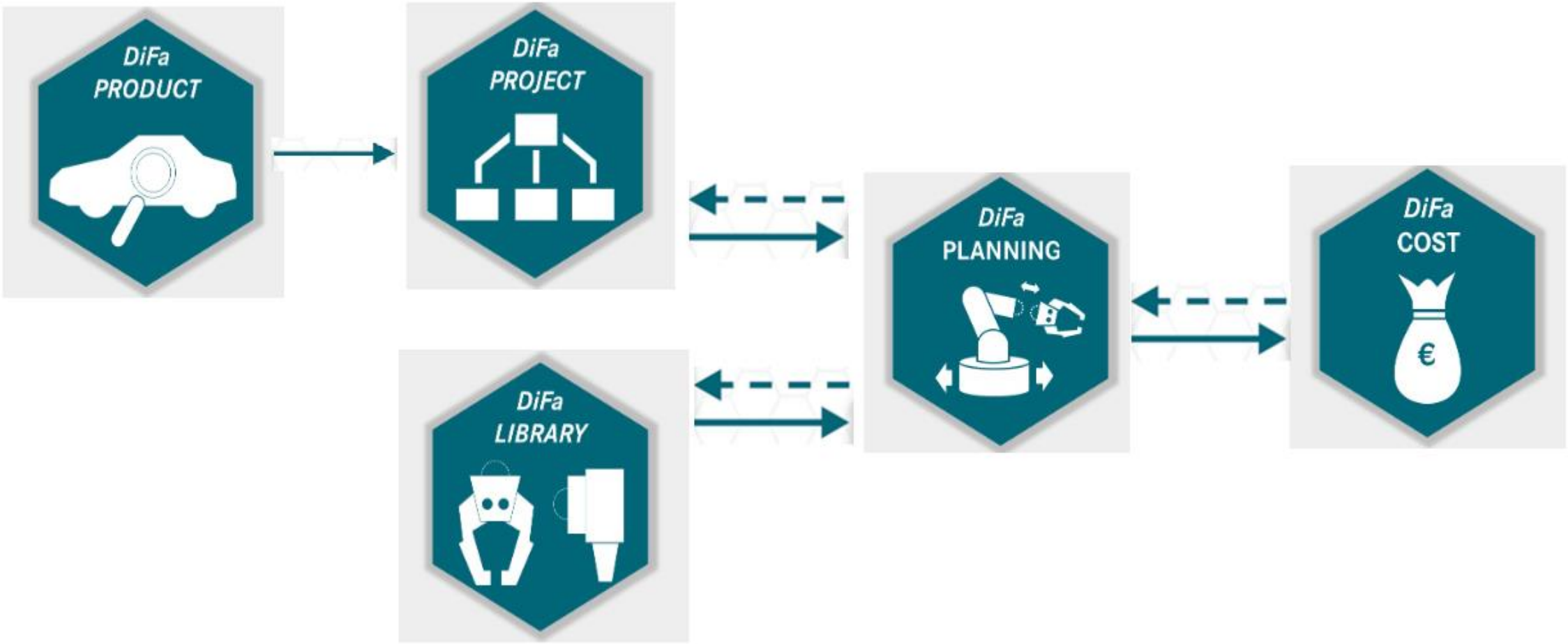


Which applications are involved?





Which applications are involved?



DiFa PROJECT

- Uniform project concept for the planning projects
- Planning premises available at a central location for all users
- Standardized project milestones
- Synchronization of user rights

DiFa LIBRARY

- Uniform library of planning resources
- Partially uniform objects across different trades
- Configurable equipment modules
- Unified library together with Fapli's objects
- Live Library

DiFa COSTS

- Central office for planning costs (depending on the project)
- Synchronization with reference costing

DiFa Planning

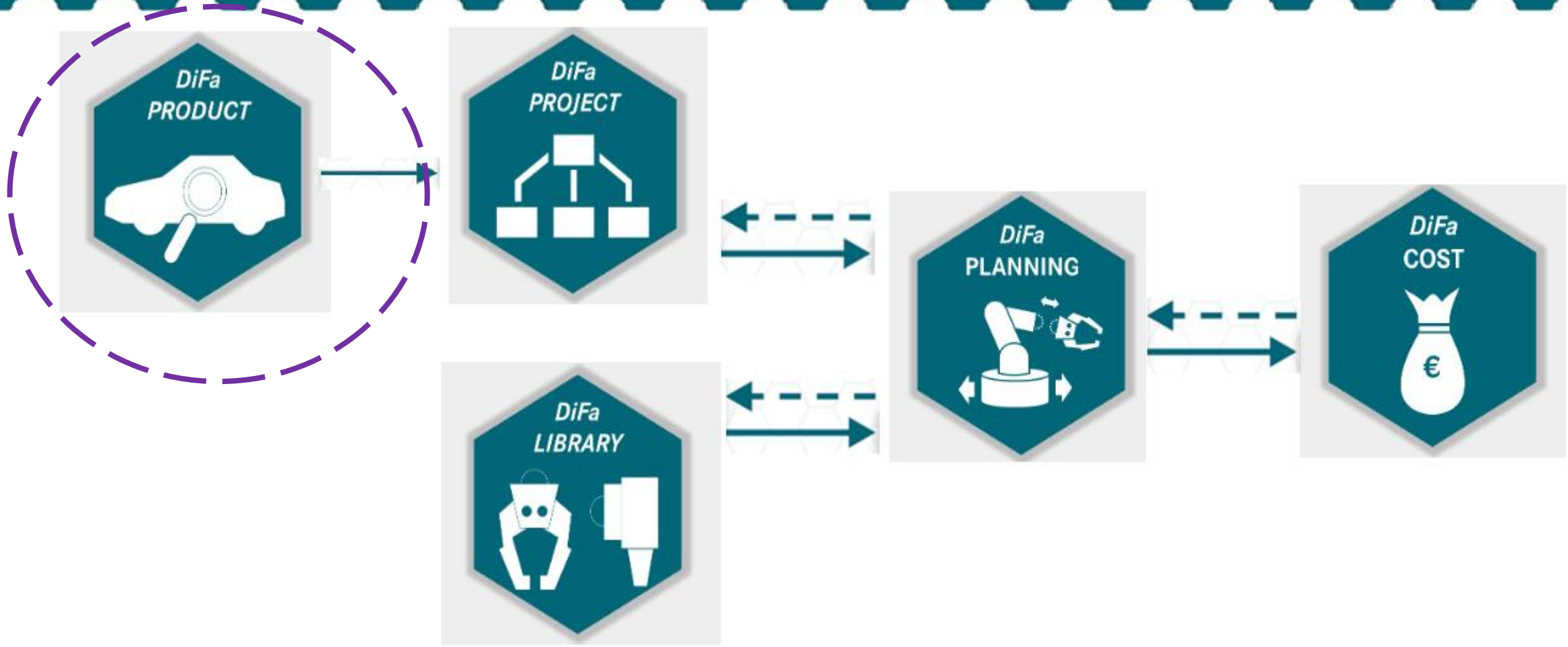
DifaPlanning is the central tool for digital plant engineering. Here, quantity structures are set up on the basis of the standardized equipment from DifaLibrary and the associated 3D layouts are created in order to derive cost and space requirements.

DiFa Product

Product data import & analysis Component & VE geometries
Code, buildability, NICE Component planning mapping
VE planning including NICE variant management

- *Factory filter*
- *Basic model*
- *Joining step variants*

Which applications are involved?



DiFa Product – *Classification*

Product Development

Smaragd
Product Data Management

ProductPartList Documentation(E-BOM)

Import

NICE

CAD Materials,FAQ,basisparameters,WPS

Import

Production Planning

DiFa PRODUCT

Product Analyse

Single Vehicle Filter

Join Sequence with join technique

(M-BOM)

Variant

Factory filter basis model variants

Export

Internal planning/supplier

Product pliers protection

TeamCenter

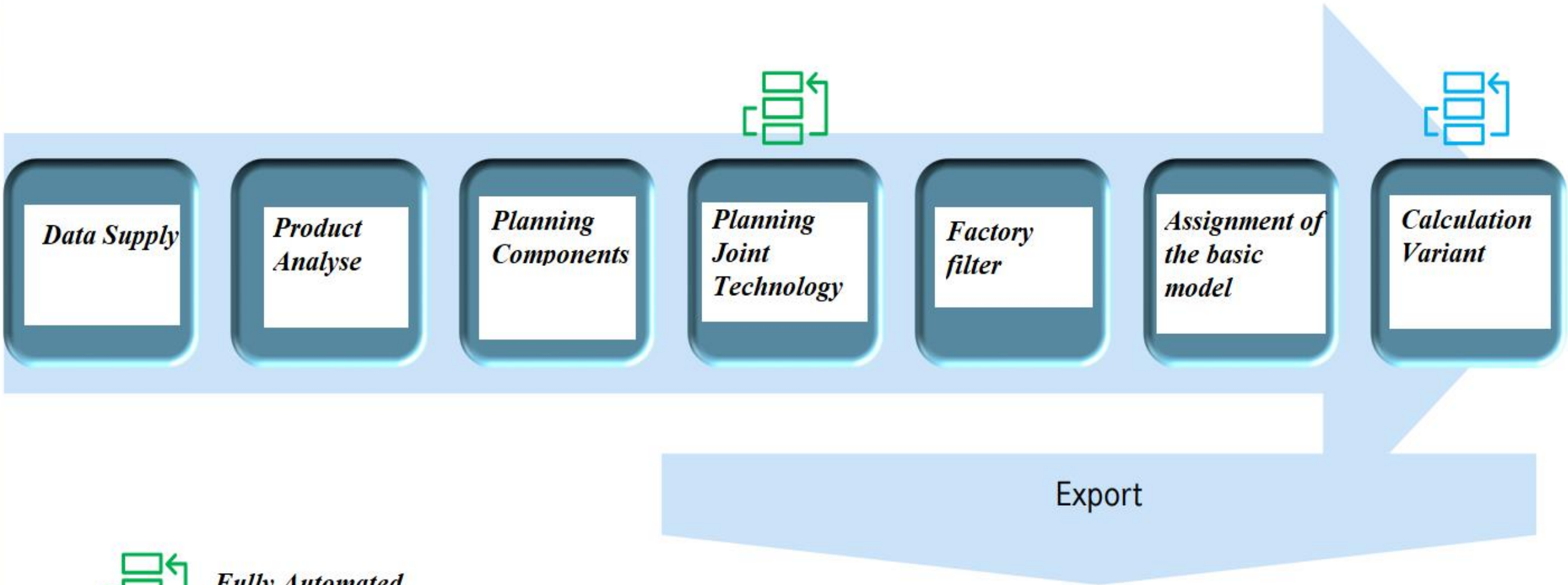
Construction NX

Simulation

Plant planning and control up to VIBN

With the joint sequence and variant management, DiFa Product forms the basis for all further planning activities

DiFa Product - Workflow



Variant Concept DiFa Product basis model

Input

141.106 SW IN HI

141.103 ZB D-Piller

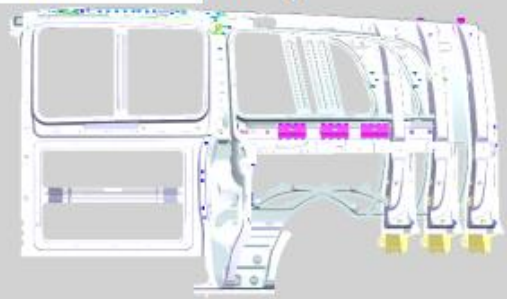
141.109 SW IN B-/C-Piller

141.108 SW IN Roof Frame

141.091

Output

Unfilterd (MAX)



Basic Model

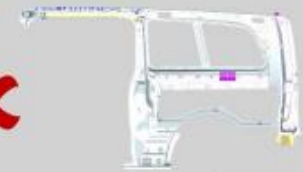
IN1 +- T19

IN2 +- T19

IN3 +- T19

IN1 + T19

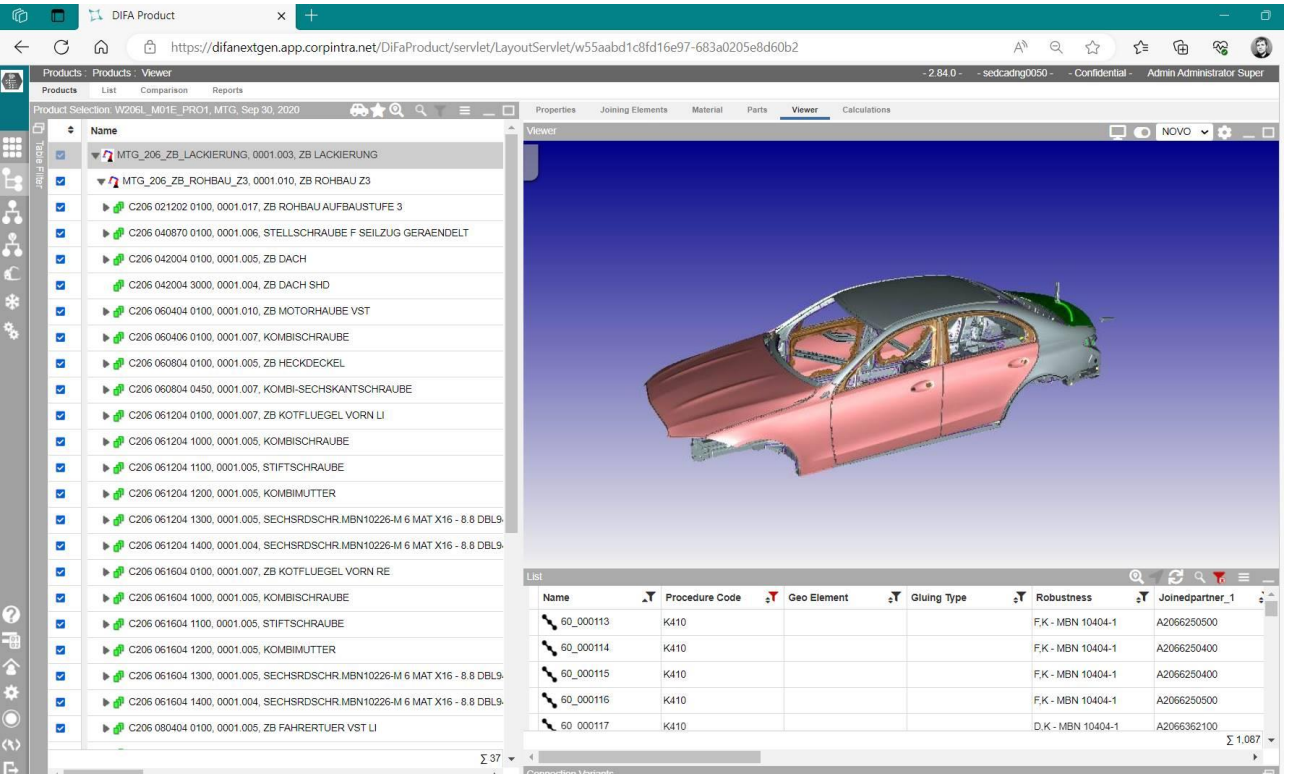
IN2 + T19



IN3 + T19

- *All variants of the SW inside and pre-ZBs go into the joint level 141.091; output: side wall inside for all variants*
- *In order to be able to work efficiently in the joint stage, filtering on the 6 basic models is necessary (using the given code)*

EBOM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Products : Products : Viewer
- 2.84.0 - - sedcadng0050 - - Confidential - Admin Administrator Super
Products List Comparison Reports
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Properties Joining Elements Material Parts Viewer Calculations
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MTG_206_ZB_ROHBAU_Z3, 0001.010, ZB ROHBAU Z3
C206 021202 0100, 0001.017, ZB ROHBAU AUFBAUSTUFE 3
C206 040870 0100, 0001.006, STELLSCHRAUBE F SEILZUG GERAENDELT
C206 042004 0100, 0001.005, ZB DACH
C206 042004 3000, 0001.004, ZB DACH SHD
C206 060404 0100, 0001.010, ZB MOTORHAUBE VST
C206 060406 0100, 0001.007, KOMBISCHRAUBE
C206 060804 0100, 0001.005, ZB HECKDECKEL
C206 060804 0450, 0001.007, KOMBI-SECHSKANTSCHRAUBE
C206 061204 0100, 0001.007, ZB KOTFLUEGEL VORN LI
C206 061204 1000, 0001.005, KOMBISCHRAUBE
C206 061204 1100, 0001.005, STIFTSCHRAUBE
C206 061204 1200, 0001.005, KOMBIMUTTER
C206 061204 1300, 0001.005, SECHSRDSCHR.MBN10226-M 6 MAT X16 - 8.8 DBL9
C206 061204 1400, 0001.004, SECHSRDSCHR.MBN10226-M 6 MAT X16 - 8.8 DBL9
C206 061604 0100, 0001.007, ZB KOTFLUEGEL VORN RE
C206 061604 1000, 0001.005, KOMBISCHRAUBE
C206 061604 1100, 0001.005, STIFTSCHRAUBE
C206 061604 1200, 0001.005, KOMBIMUTTER
C206 061604 1300, 0001.005, SECHSRDSCHR.MBN10226-M 6 MAT X16 - 8.8 DBL9
C206 061604 1400, 0001.004, SECHSRDSCHR.MBN10226-M 6 MAT X16 - 8.8 DBL9
C206 080404 0100, 0001.005, ZB FAHRERTUER VST LI
Viewer
NOVO
List
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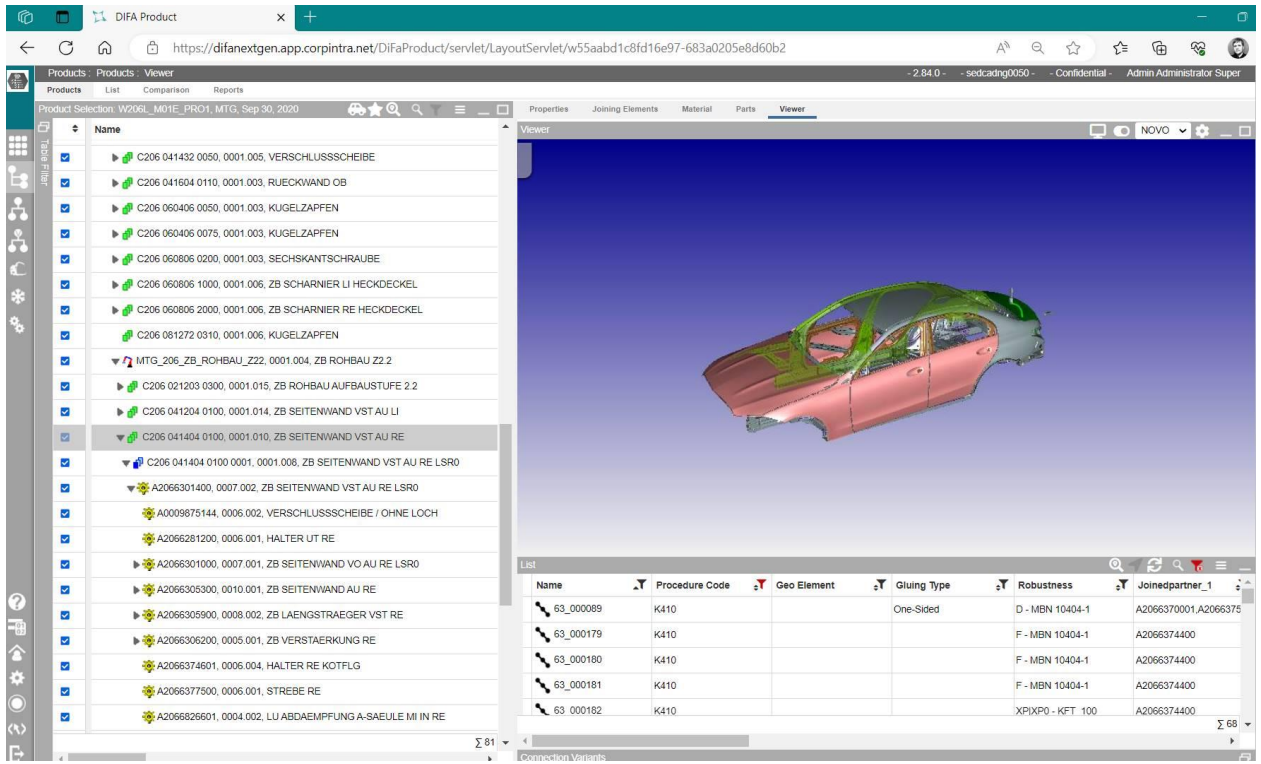
60_000113 K410 F,K - MBN 10404-1 A2066250500
60_000114 K410 F,K - MBN 10404-1 A2066250400
60_000115 K410 F,K - MBN 10404-1 A2066250400
60_000116 K410 F,K - MBN 10404-1 A2066250500
60_000117 K410 D,K - MBN 10404-1 A2066362100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- 2.84.0 - - sedcadng0050 - - Confidential - Admin Administrator Super
Products List Comparison Reports
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Properties Joining Elements Material Parts Viewer
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C206 060406 0050, 0001.003, KUGELZAPFEN
C206 060406 0075, 0001.003, KUGELZAPFEN
C206 060806 0200, 0001.003, SECHSKANTSCHRAUBE
C206 060806 1000, 0001.006, ZB SCHARNIER LI HECKDECKEL
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A2066305900, 0008.002, ZB LAENGSTRAEGER VST RE
A2066306200, 0005.001, ZB VERSTAERKUNG RE
A2066374601, 0006.004, HALTER RE KOTFLG
A2066377500, 0006.001, STREBE RE
A2066826601, 0004.002, LU ABDAEMPFUNG A-SAEULE MI IN RE
Viewer
NOVO
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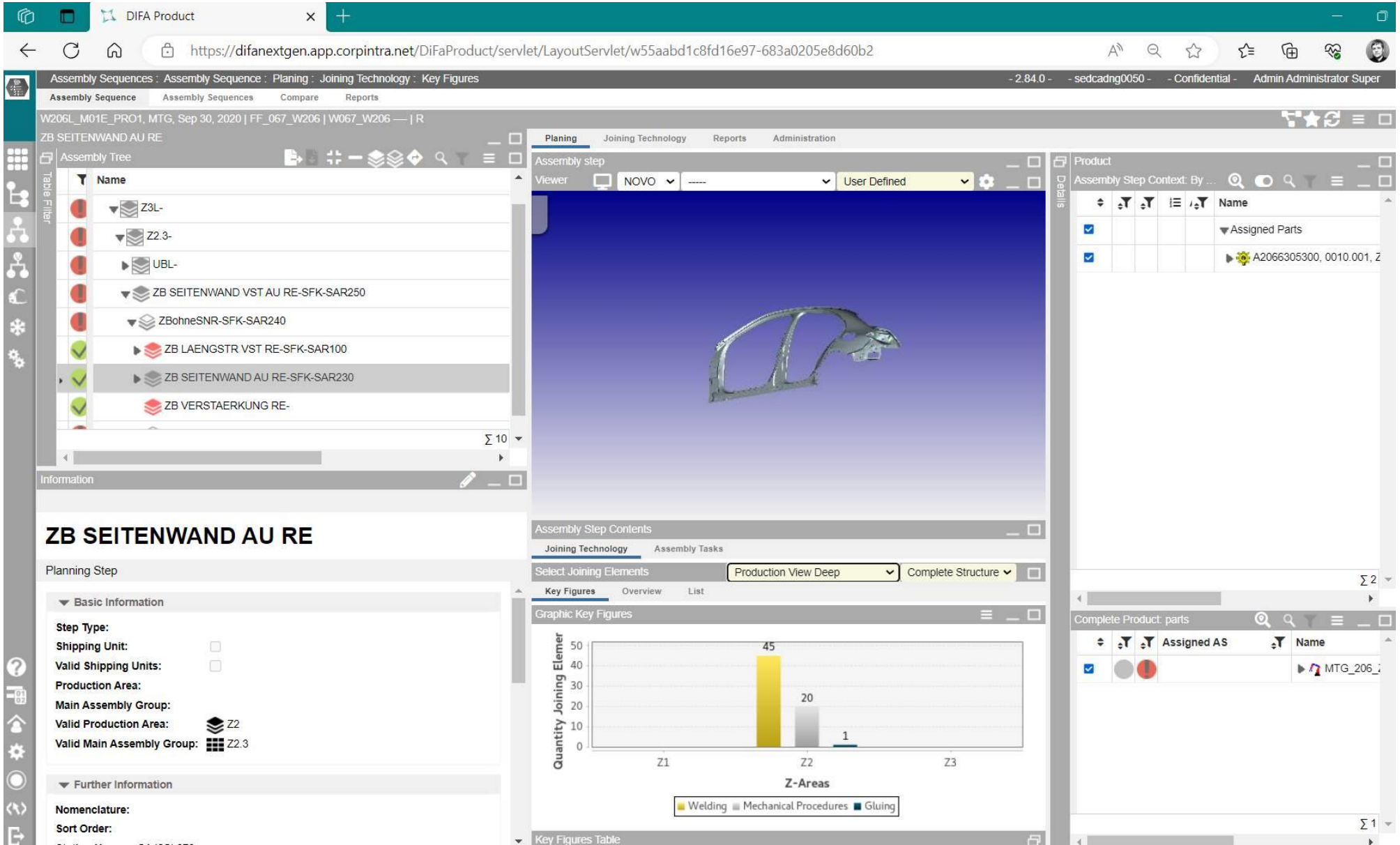
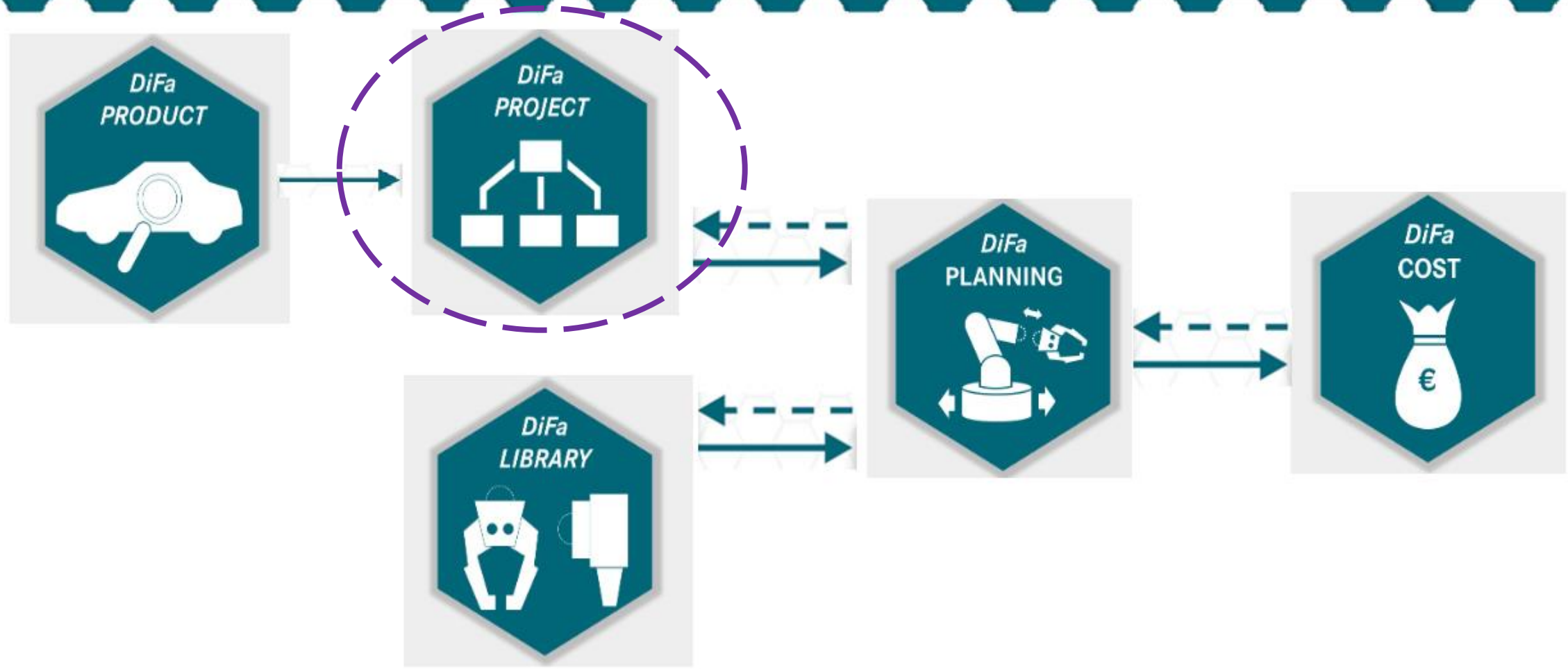
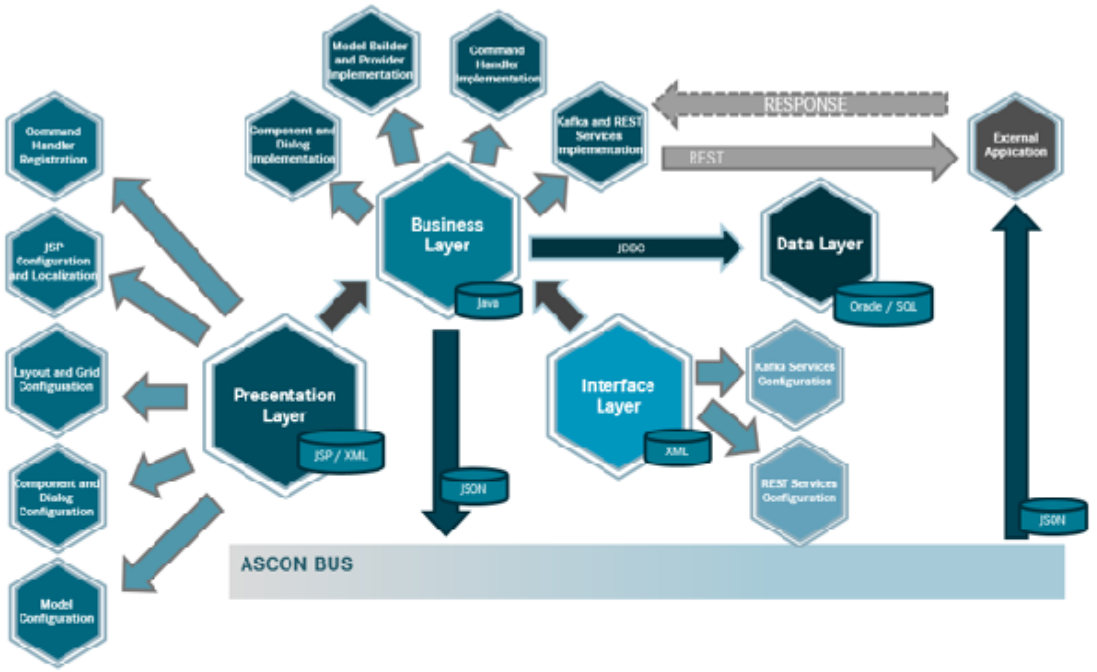
63_000179 K410 F - MBN 10404-1 A2066374400
63_000180 K410 F - MBN 10404-1 A2066374400
63_000181 K410 F - MBN 10404-1 A2066374400
63_000182 K410 XPIXP0 - KFT_100 A2066374400

MBOM


DIFA Product
https://difanextgen.app.corpintra.net/DiFaProduct/servlet/LayoutServlet/w55aabd1c8fd16e97-683a0205e8d60b2
Assembly Sequences : Assembly Sequence : Planing : Joining Technology : Key Figures
- 2.84.0 - - sedcadng0050 - - Confidential - Admin Administrator Super
Assembly Sequence
Assembly Sequences
Compare
Reports
W206L_M01E_PRO1, MTG, Sep 30, 2020 | FF_067_W206 | W067_W206 — | R
ZB SEITENWAND AU RE
Assembly Tree
Name
Z3L-
Z2.3-
UBL-
ZB SEITENWAND VST AU RE-SFK-SAR250
ZBohneSNR-SFK-SAR240
ZB LAENGSTR VST RE-SFK-SAR100
ZB SEITENWAND AU RE-SFK-SAR230
ZB VERSTAERKUNG RE-
Planing
Joining Technology
Reports
Administration
Assembly step
Viewer
NOVO
User Defined
Product
Assembly Step Context: By ...
Assigned Parts
A2066305300, 0010.001, Z
Information
ZB SEITENWAND AU RE
Planning Step
Basic Information
Step Type:
Shipping Unit:
Valid Shipping Units:
Production Area:
Main Assembly Group:
Valid Production Area: Z2
Valid Main Assembly Group: Z2.3
Further Information
Nomenclature:
Sort Order:
Assembly Step Contents
Joining Technology
Assembly Tasks
Select Joining Elements
Production View Deep
Complete Structure
Key Figures
Overview
List
Graphic Key Figures
Quantity Joining Elemer
50
40
30
20
10
0
45
20
1
Z1
Z2
Z3
Z-Areas
Welding
Mechanical Procedures
Gluing
Key Figures Table
Complete Product: parts
Assigned AS
Name
MTG_206_

Which applications are involved?

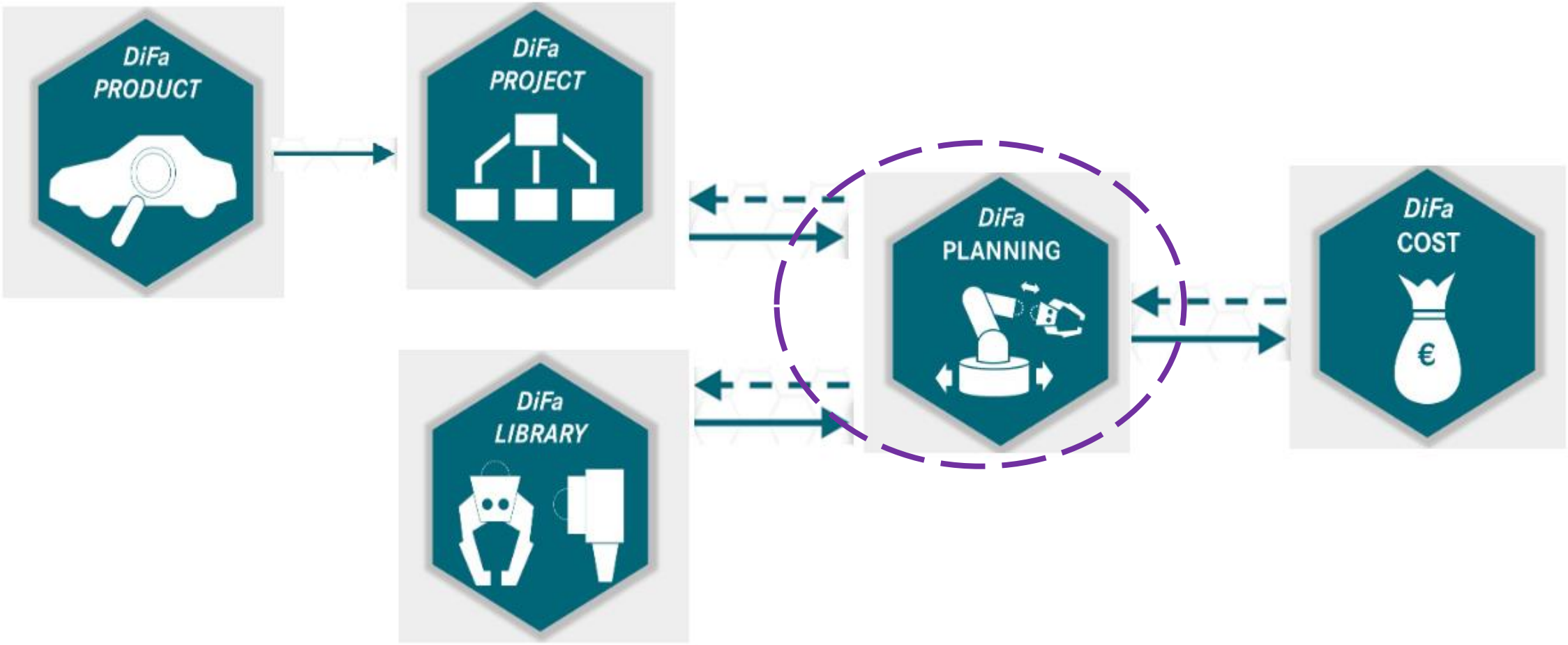




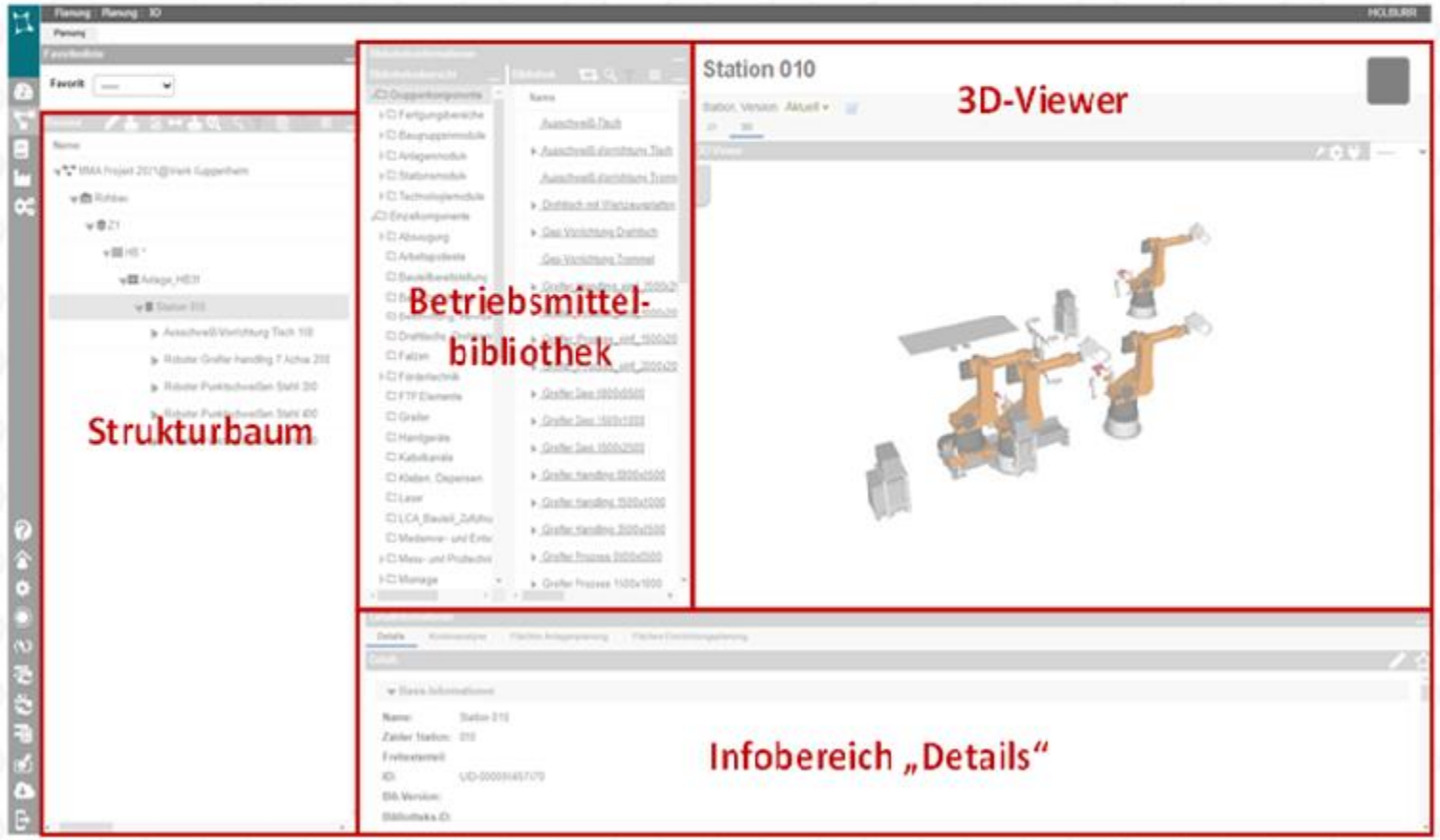
*About DiFa***PROJECT**

- Uniform project terminology for the planning projects
- Planning premises available at a central location for all users (“Prämissendatenbank”)
- Standardized project milestones
- Synchronization of user rights
- Standardized supplier packages

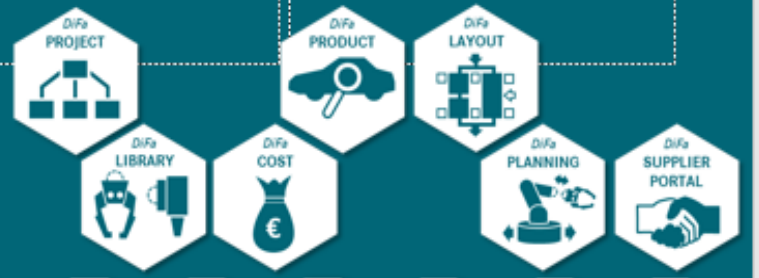
Which applications are involved?



DiFa Planning User Interface



Structure of the training



Special 1:
Configuration ✓

Special 2:
Connectors ✓

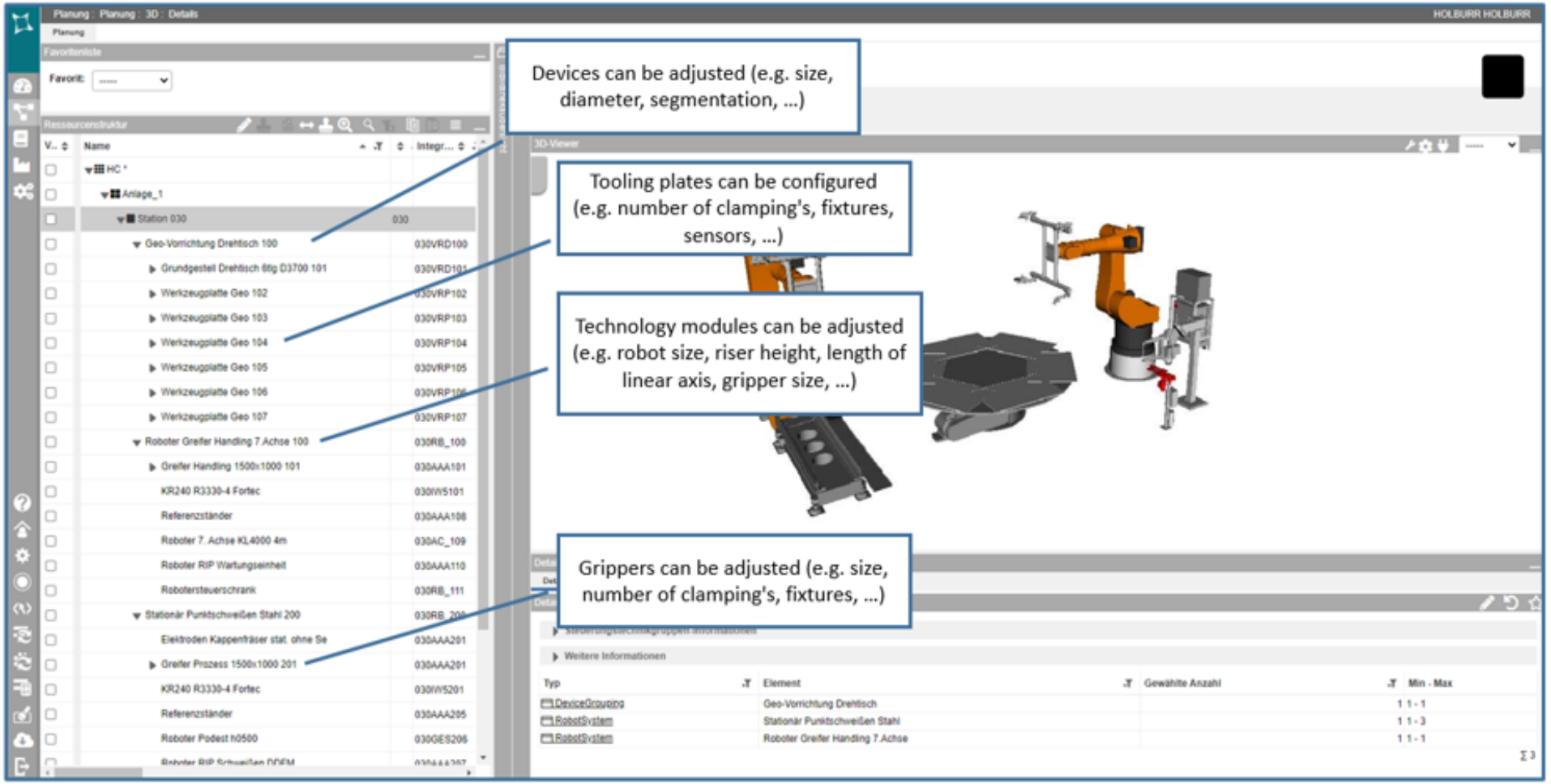
Structure of a resource structure ✓

Creation of a quantity structure ✓

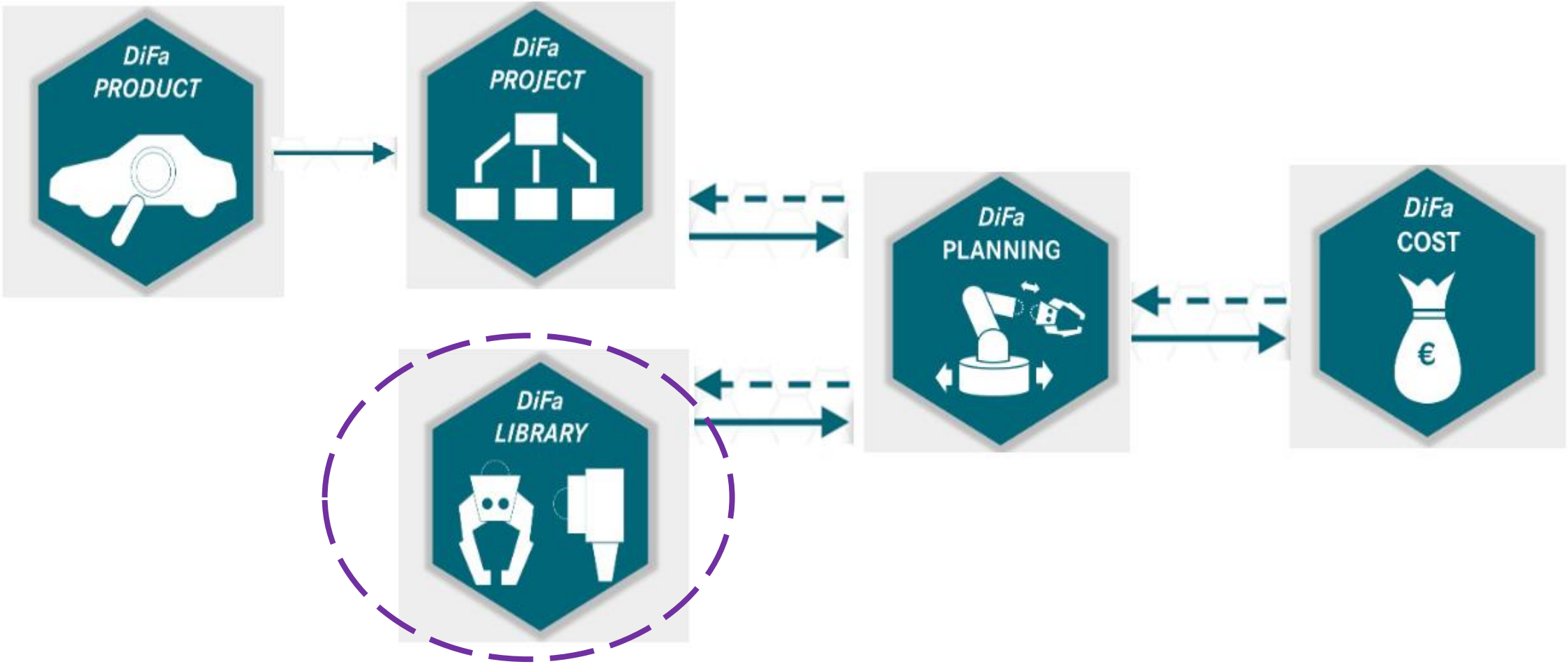
3D layouting ✓

Basics:
Entrance
Project search
User interface ✓

Configuration of equipment



Which applications are involved?



DiFa Library

Creating Single Components

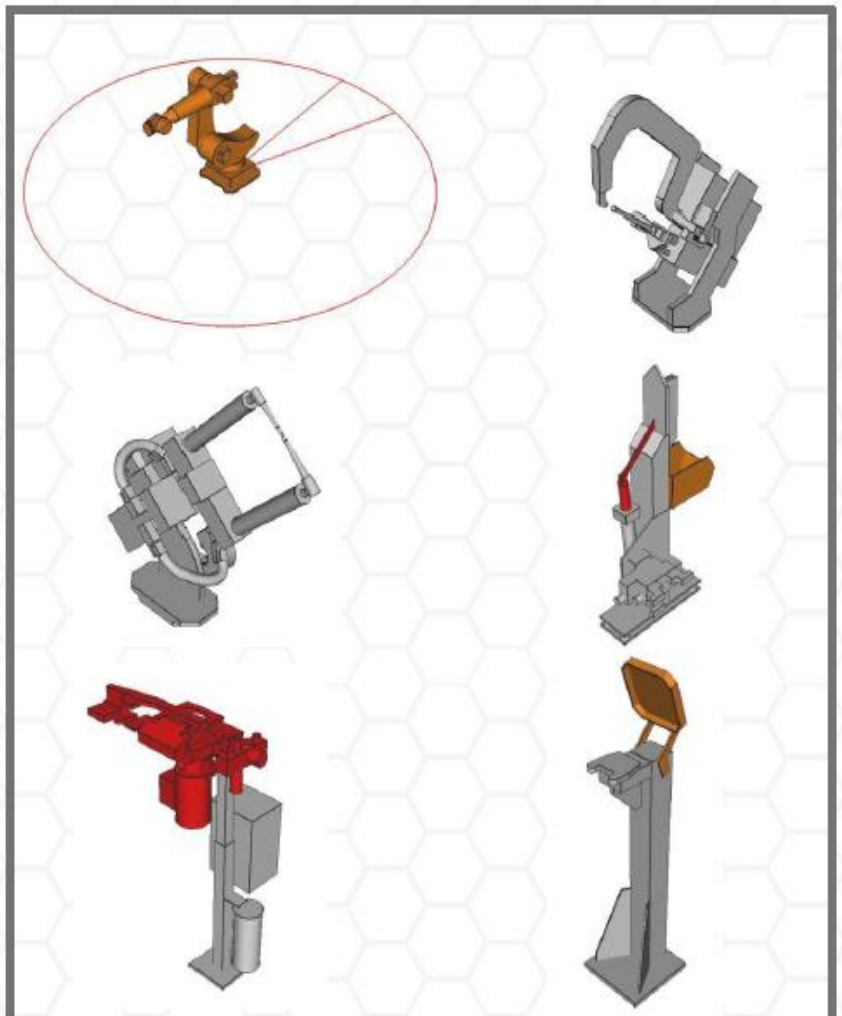
Creating Group Components

Modifying/ Managing Components

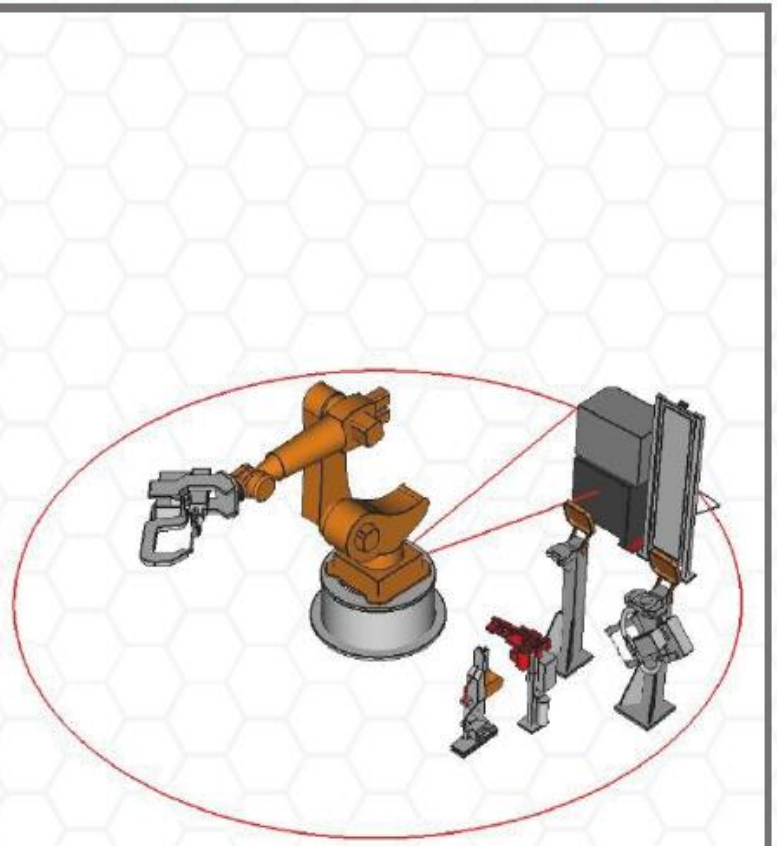
Destination of the library:

- Uniform library of planning resources
- Partially uniform objects across different shops
- Configurable equipment modules
- Unified library together with Faplis objects
- Live Library

Management and sorting logic – Structure of a library element

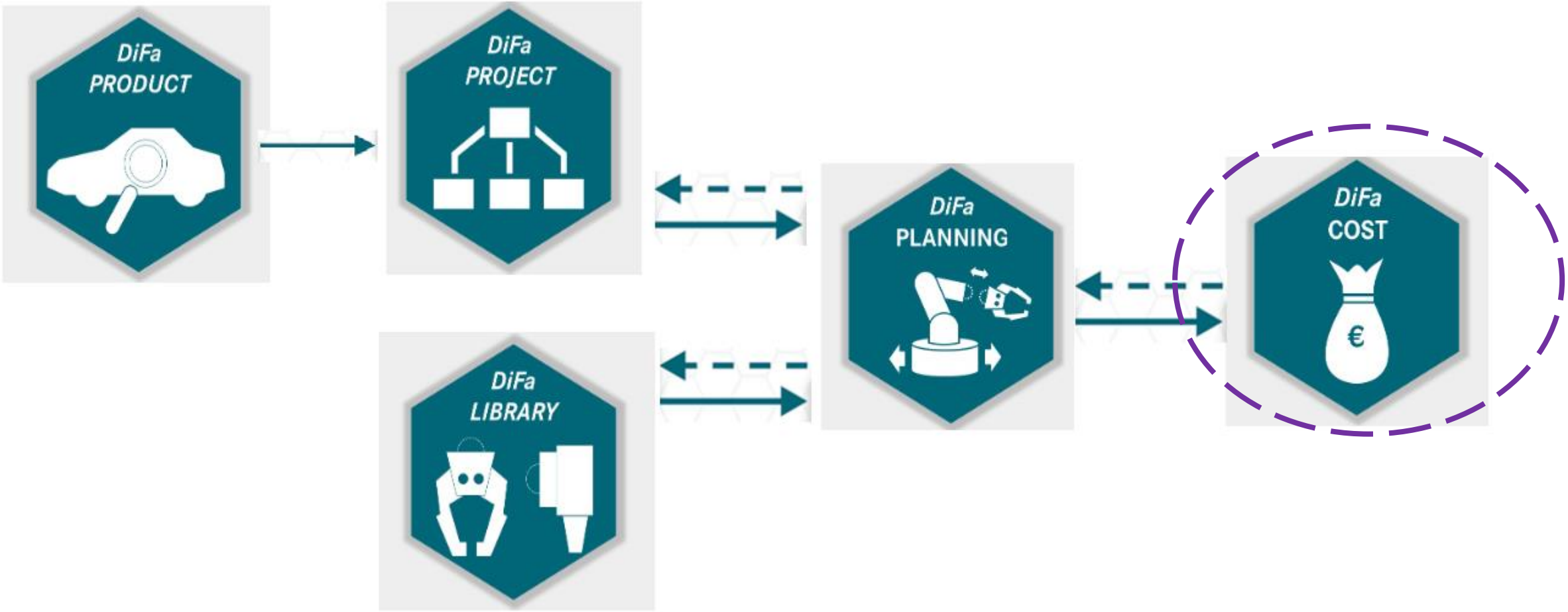


Single Components



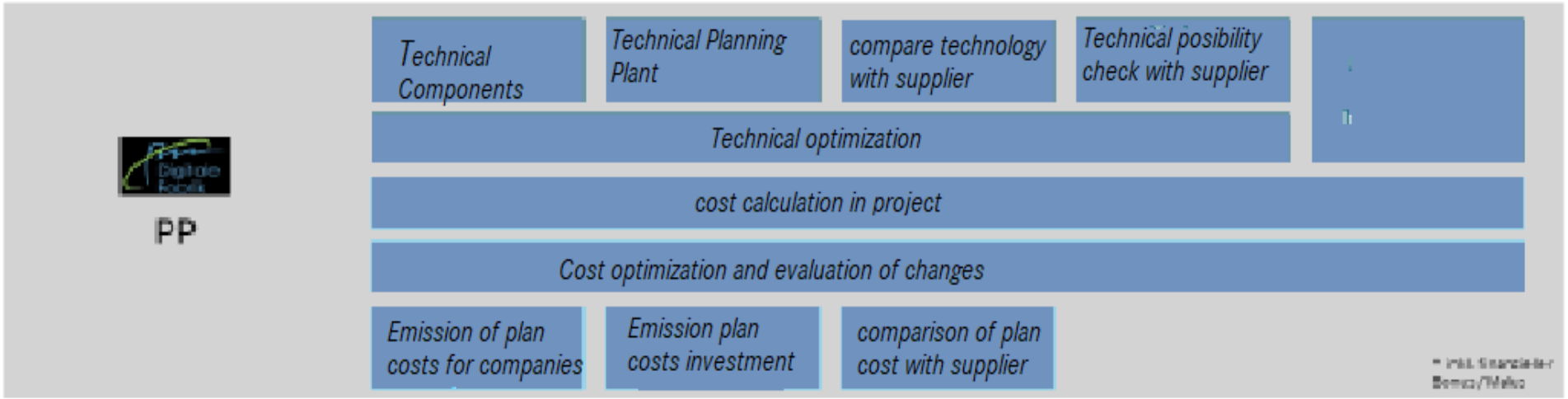
Group component

Which applications are involved?



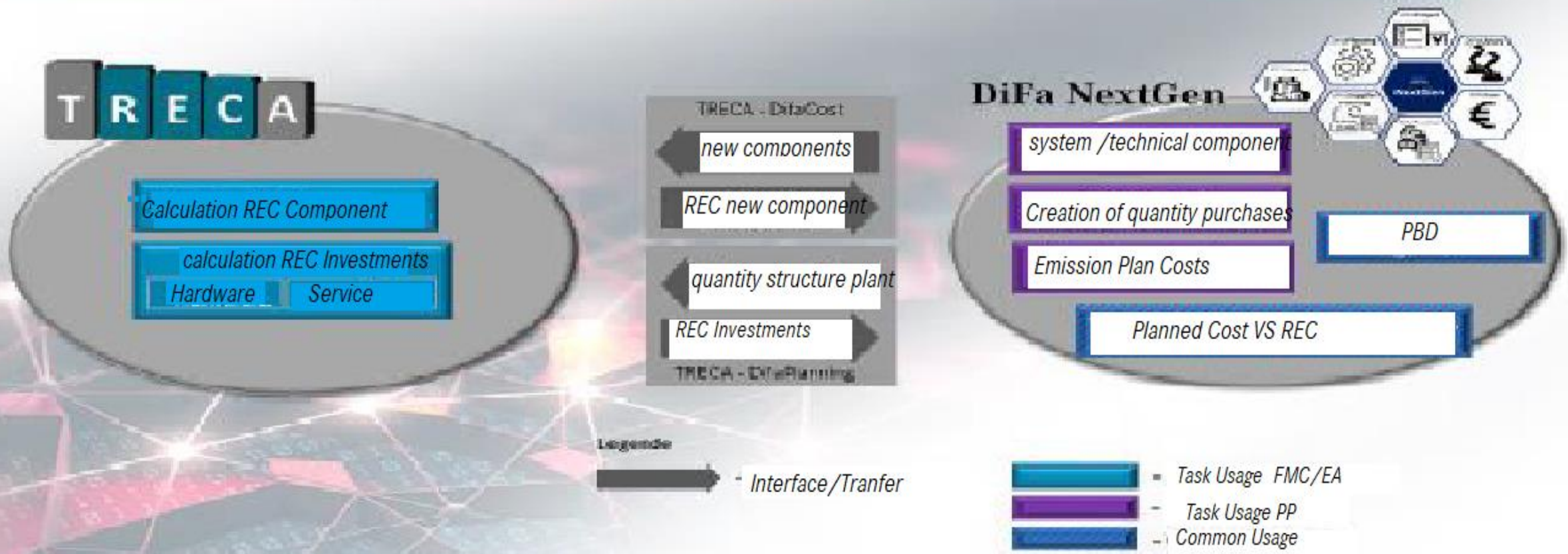
DiFa Cost

Current situation: cooperation AKV costs PCE (FMC/EA) with PP

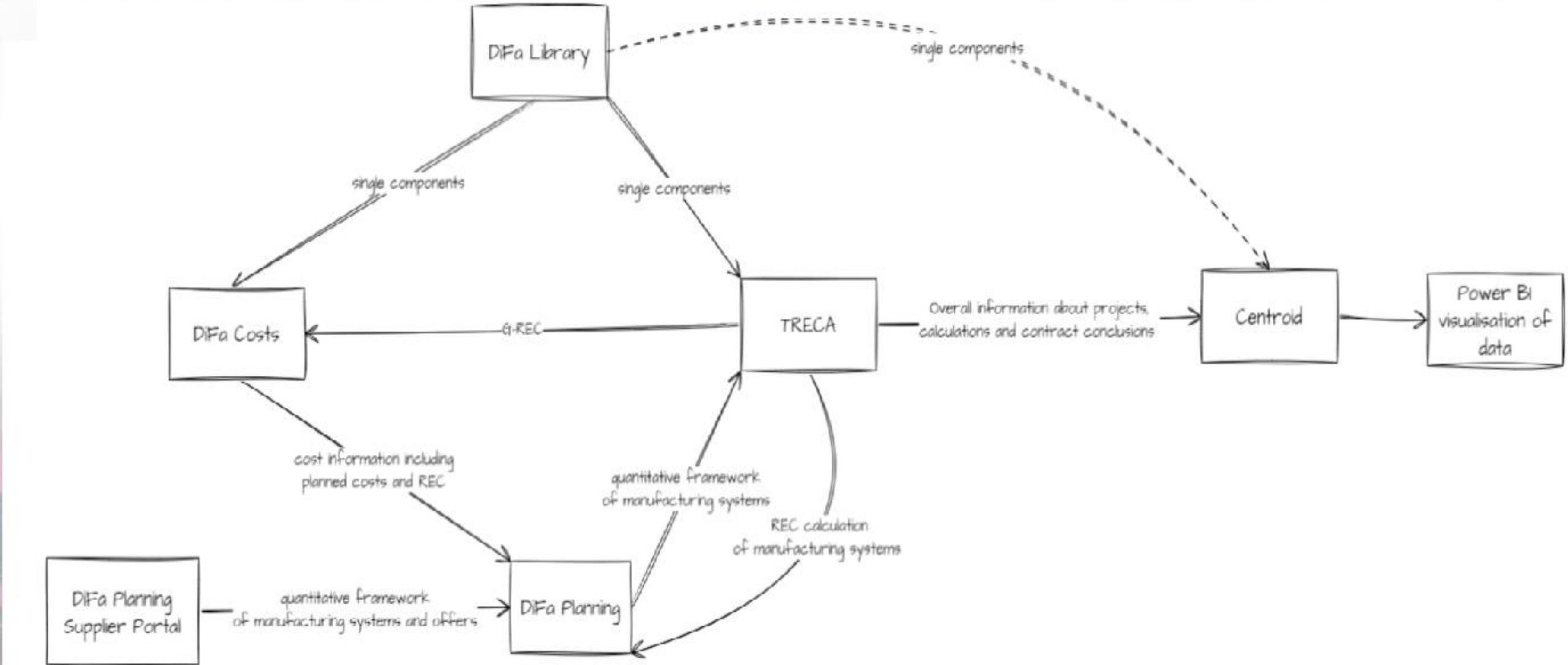


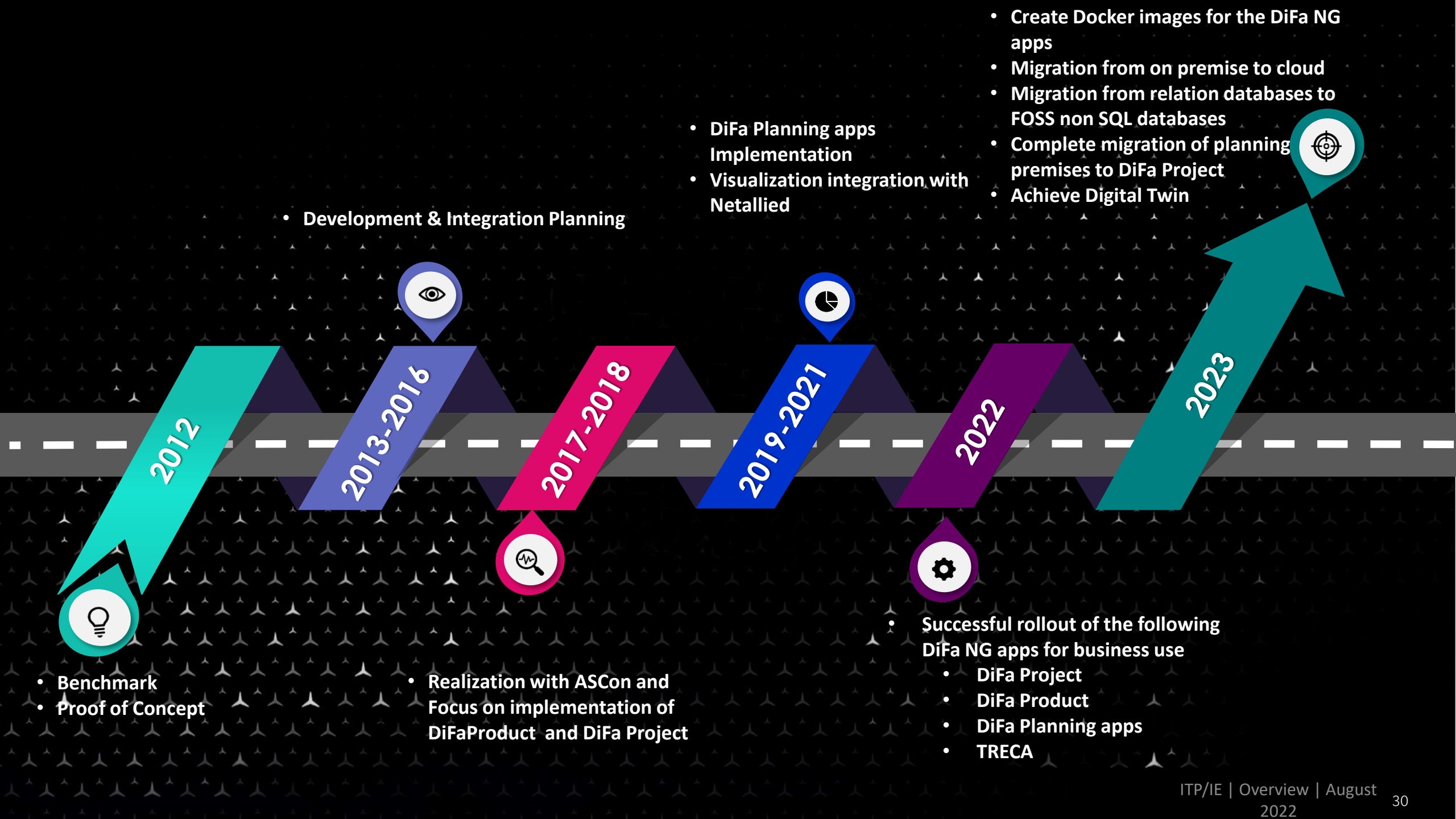
DiFa Cost

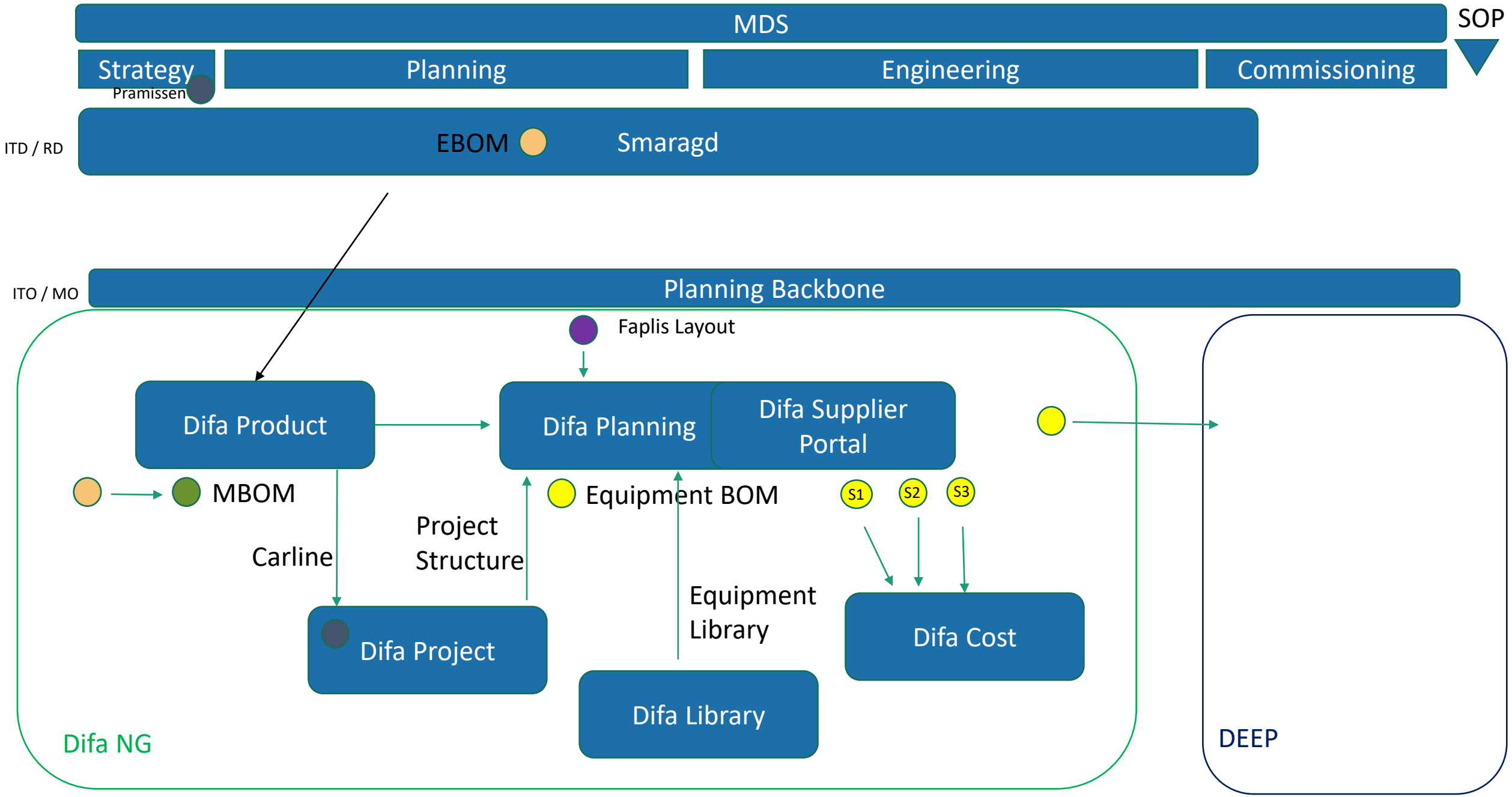
Interaction TRECA & Difa for component connection (G-REC hardware) and quantity structure binding (Detail-REC hardware & DL)



DiFa Cost


DIFa Library
single components
single components
single components
DIFa Costs
G-REC
TRECA
Overall information about projects, calculations and contract conclusions
Centroid
Power BI visualisation of data
cost information including planned costs and REC
quantitative framework of manufacturing systems
REC calculation of manufacturing systems
DIFa Planning Supplier Portal
quantitative framework of manufacturing systems and offers
DIFa Planning


2012
2013-2016
2017-2018
2019-2021
2022
2023
• Benchmark
• Proof of Concept
• Development & Integration Planning
• Realization with ASCon and Focus on implementation of DiFaProduct and DiFa Project
• DiFa Planning apps Implementation
• Visualization integration with Netallied
• Successful rollout of the following DiFa NG apps for business use
• DiFa Project
• DiFa Product
• DiFa Planning apps
• TRECA
• Create Docker images for the DiFa NG apps
• Migration from on premise to cloud
• Migration from relation databases to FOSS non SQL databases
• Complete migration of planning premises to DiFa Project
• Achieve Digital Twin


MDS
SOP
Strategy
Planning
Engineering
Commissioning
Pramissen
ITD / RD
EBOM
Smaragd
ITO / MO
Planning Backbone
Faplis Layout
Difa Product
Difa Planning
Difa Supplier Portal
MBOM
Equipment BOM
S1
S2
S3
Carline
Project Structure
Equipment Library
Difa Project
Difa Cost
Difa Library
Difa NG
DEEP