Simplifying the workflow in S1000D and ATA projects by reusing maintenance task and material data

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Personal Data

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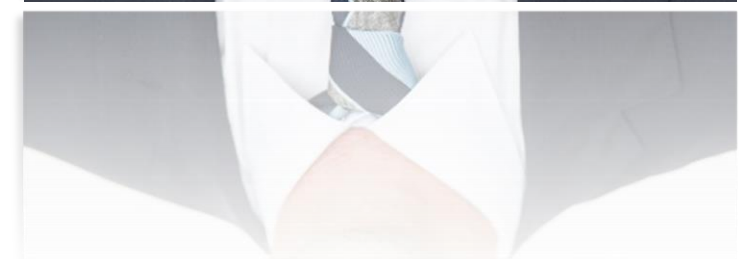
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Subject Matter Expert for

FULL LINE SUPPLIER
FOR IPS (ILS)
INTEGRATED PRODUCT SUPPORT

HICO

TRAINING ACADEMY PANNONIA

WORLD CLASS SOLUTIONS
FOR IPSS & ISS
INTEGRATED PRODUCT SUPPORT SYSTEMS
IN-SERVICE SUPPORT SYSTEMS
SYSTEM INTEGRATOR
ERP, PLM, MRO

SERVICE PROVIDER
FOR IPS (ILS) - DISCIPLINES
DESIGN INTERFACE
SUSTAINING ENGINEERING
SUPPLY SUPPORT
MAINTENANCE PLANNING & MANAGEMENT
TECHNICAL DATA (TECHNICAL DOCUMENTATION)

S1000D   S2000M

Agenda

- Organizational challenges and stakeholders
- Benefits of a common IPS repository
- Increase the efficiency in creation of TechDoc
- Change- and Configuration Management
- Tagging-Guideline and Writing-Procedures
- Challenges during implementation
- Real world examples

Organizational challenges and stakeholders
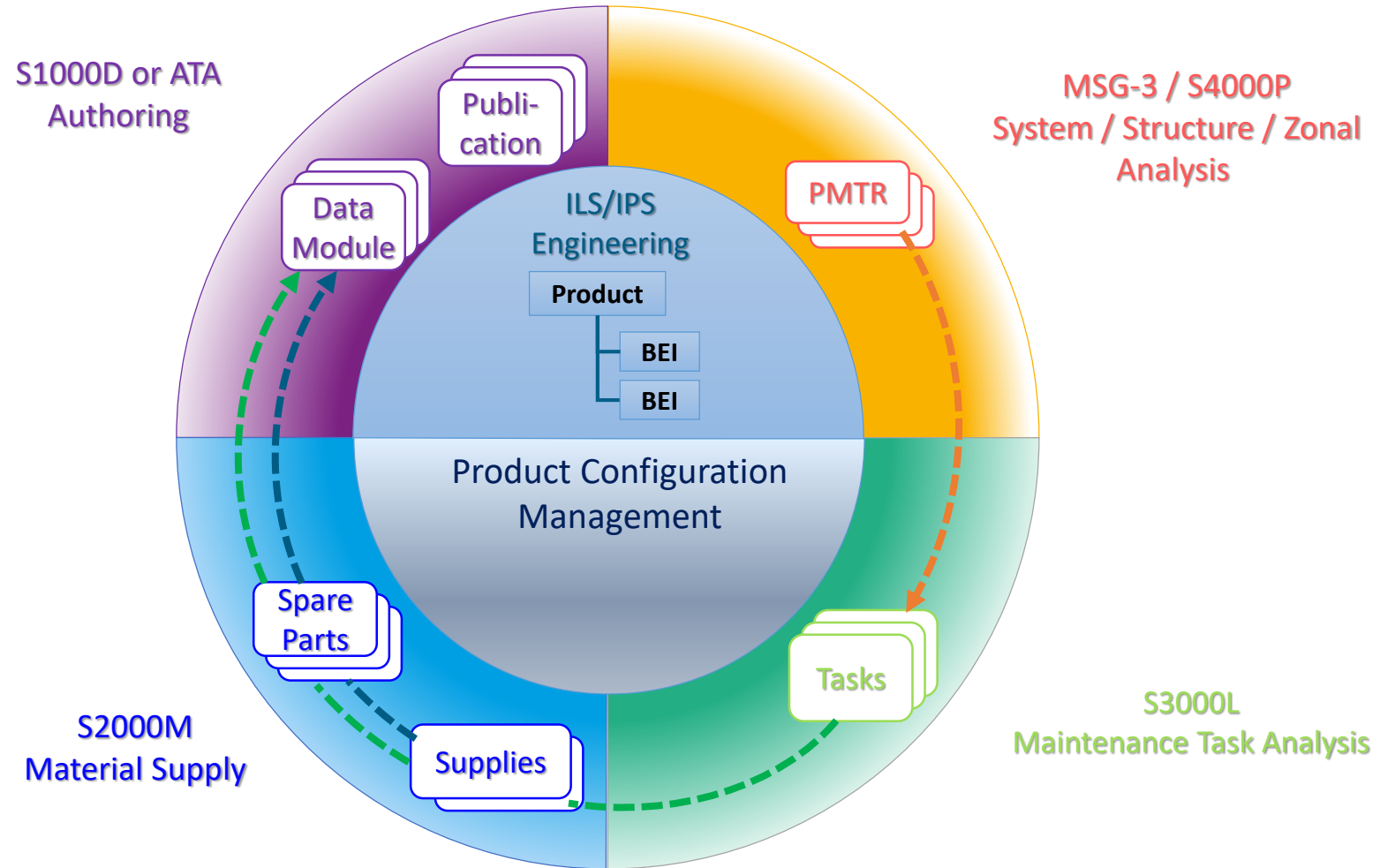
Organizational challenges and stakeholders

In the whole maintenance development process many types of data, stakeholders, databases and processes are involved

High risk of quality loss

Engineer

Engineering Database

Support Engineer

LSA

Engineering Process

LSA/PSA Analyst

TechDoc Database

TechDoc Process

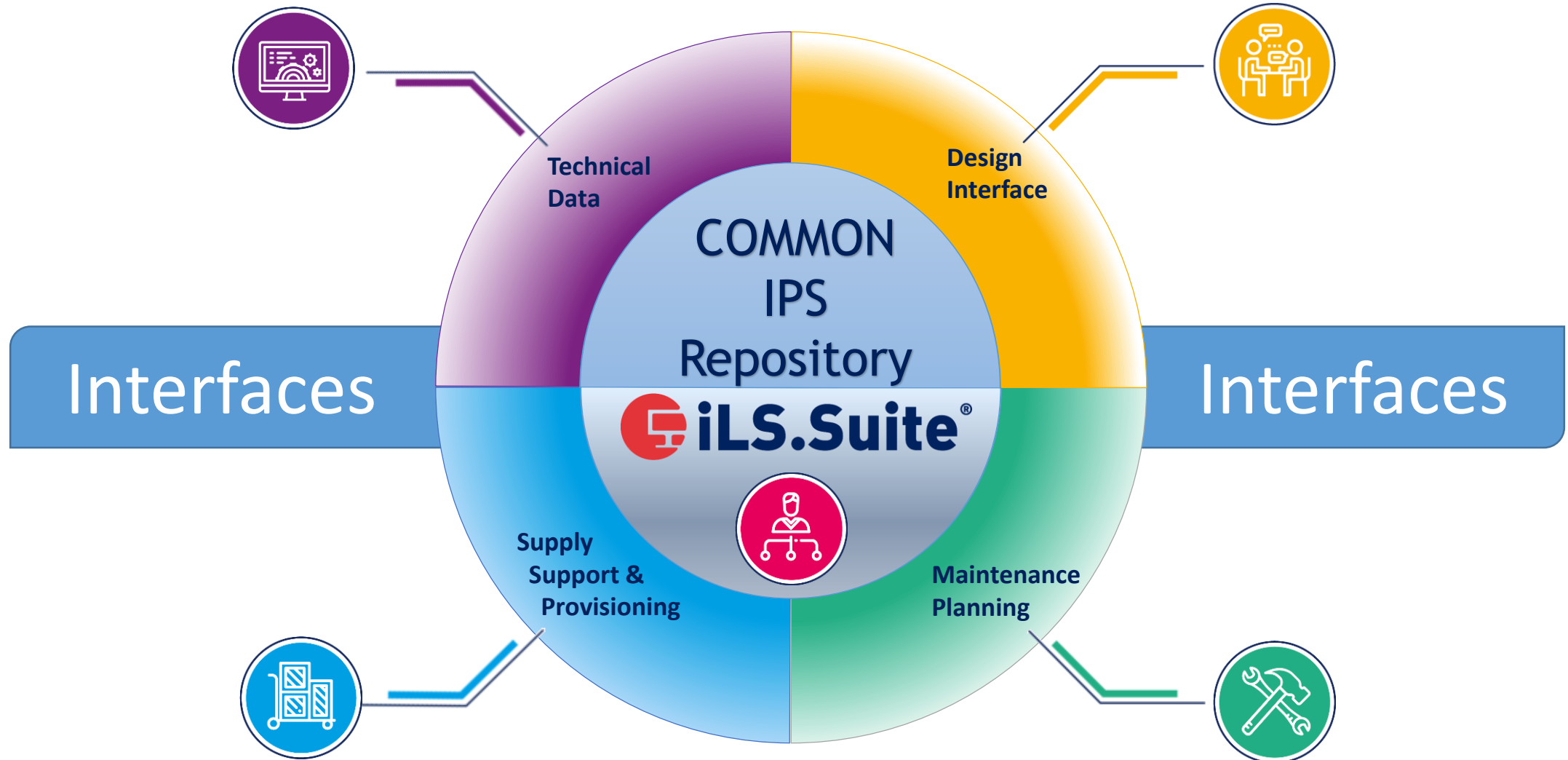Author

Material Database

Additional Challenges

- Mixed fleets and operators

- Different TechDoc-Standard (S1000D and ATA) & project rules

- Civil and military projects

- Mixed toolset and IT-systems

- Many interfaces for data interchange

- Loss of data or rewrite of data

- No single point of contact for technical issues

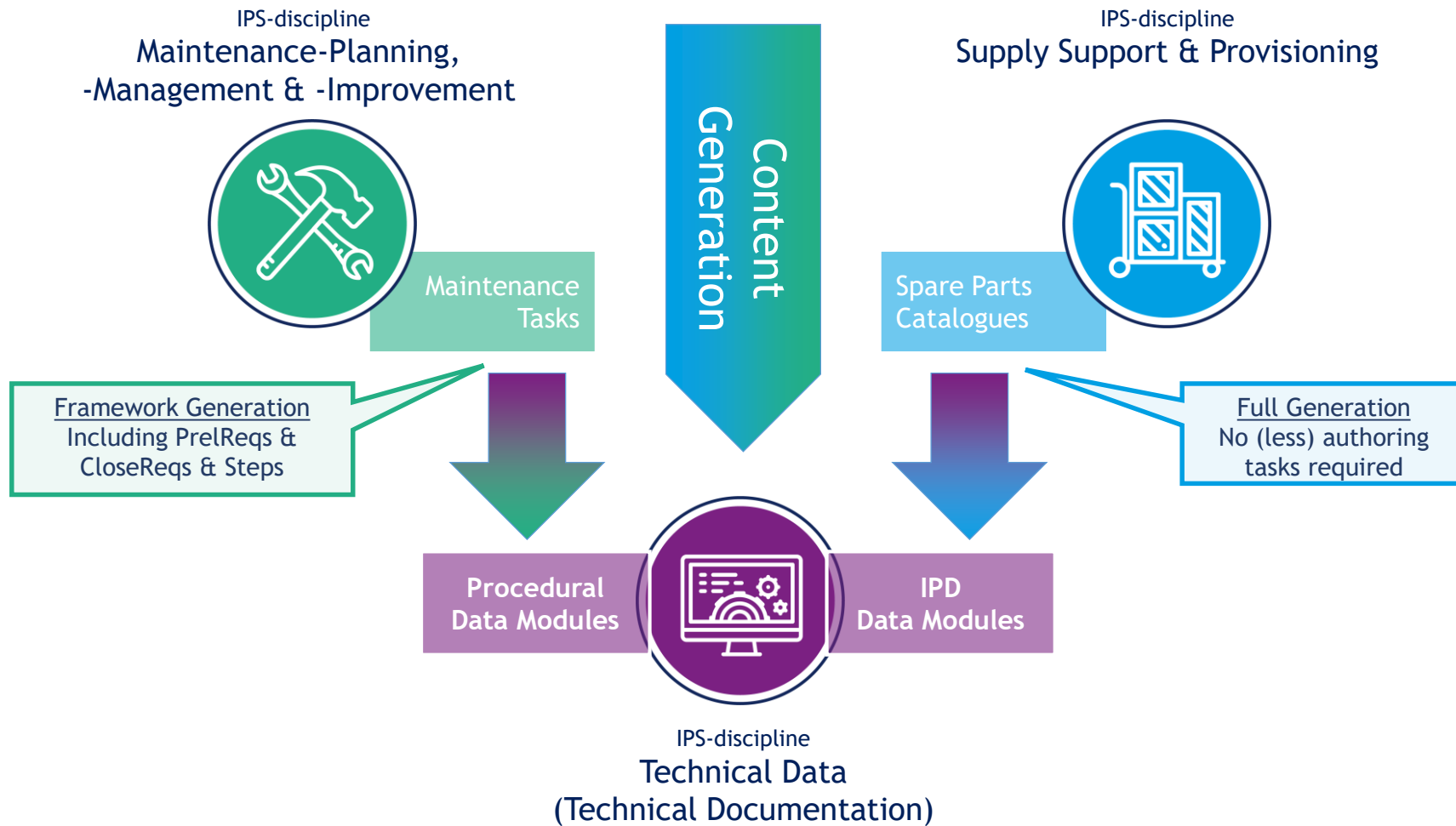- Different publishing solutions

Benefits of a common IPS repository

Benefits of a common IPS repository

Technical Data

Design Interface

Supply Support & Provisioning

Maintenance Planning

COMMON IPS Repository

iLS.Suite®

Interfaces

Interfaces

Increase in efficiency in creation of TechDoc

IPS-discipline
**Maintenance-Planning,
-Management & -Improvement**

IPS-discipline
Supply Support & Provisioning

Content Generation

Maintenance Tasks

Spare Parts Catalogues

Framework Generation
Including PrelReqs &
CloseReqs & Steps

Full Generation
No (less) authoring
tasks required

**Procedural
Data Modules**

**IPD
Data Modules**

IPS-discipline
**Technical Data
(Technical Documentation)**

Procedural/Task generation

MFC: N1234
PNR: ENG123-A4

Remove procedure
Open for access procedure
Disassemble procedure
Repair procedure

- Rectifying or Supporting Task
- Function (Infocode)
- Preliminary / Closing Requirements (Links to Tasks)
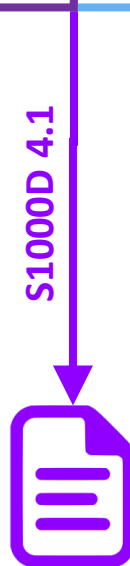- Intervals, Personal , Material, Safety
- Subtasks

Content | Generator

	S1000D 2.3	S1000D 4.1	ATA iSpec 2200
Preliminary Reqs:	<prelreqs>	<preliminaryRqmts>	-
Spares:	<spares>	<reqSpares>	-
Supplies:	<supplies>	<reqSupplies>	<con>
Support Euipment:	<supequip>	<reqSupportEquips>	-
Safety:	<safety>	<reqSafety>	<note>, <caution>, <warning>
Subtasks:	<mainfunc>	<mainProcedure>	<task> or <subtask>
	<step1>, <step2>, …	<proceduralStep>	<prcitem1>, <prcitem2>, …
Closing Reqs:	<closereqs>	<closeRqmts>	-

DMC-PRJ1-A-25-11-70-00A-300A-Z **DMC-PRJ2-ABB-A25-11-70-00AA-300A-Z** **25-11-70-870-801-A01**

IPD generation

MFC: N1234
PNR: ENG123-A4

Illustrated Parts List

- Structure (SNS), Figure + Variant
- Illustration(s) or Multimedia Objects
- Part entries
- References / Links

Content | Generator

	S1000D 2.3	**S1000D 4.1**	**ATA iSpec 2200**
SNS:	`<csn/@csn>`	`<catalogSeqNumber/@system>`	`<figure/@chapnbr, …`
Title:	`<title>`	`<title>`	`<title>`
Illustrations:	`<graphic>`	`<graphic>`	`<graphic>`
Entries:	`<csn/@item>`	`<catalogSeqNumber/@item>`	`<prtlist>`
	`<isn>`	`<itemSeqNumber>`	`<itemdata>`
Part Number:	`<mfc>, <pnr>`	`<partRef>`	`<pnr>, <iplnom> …`
Quantity:	`<qna>`	`<quantityPerNextHigherAssy>`	`<upa>`

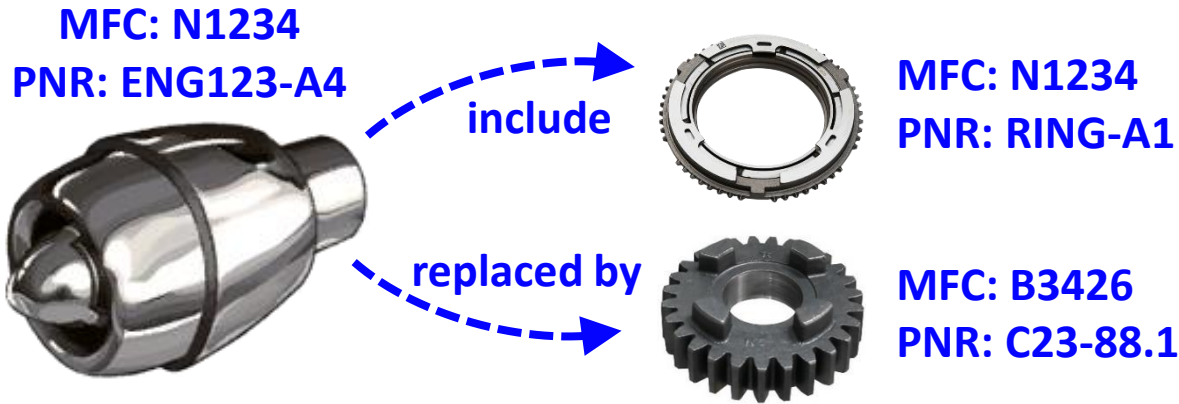**DMC-PRJ1-A-25-11-70-00A-941A-Z**   **DMC-PRJ2-ABB-A25-11-70-00AA-941A-Z**   **25-11-70-870-950-A01**

Benefits

- Reuse of independently written Tasks / IPLs

- Generation of Procedure-/Task and IPD/IPL data modules

- Flexible data mapping with project or install location specific values

- Reuse of centralized material (spares, supplies or equipment)

- Automatic linking to other Tasks / IPL

- Generation of Common Information Repository (CIR)

- Generation of Maintenance Schedule data modules

- Generation of ATA T-Files / S2000M CSNIP / UPIPCO / UPIPCT
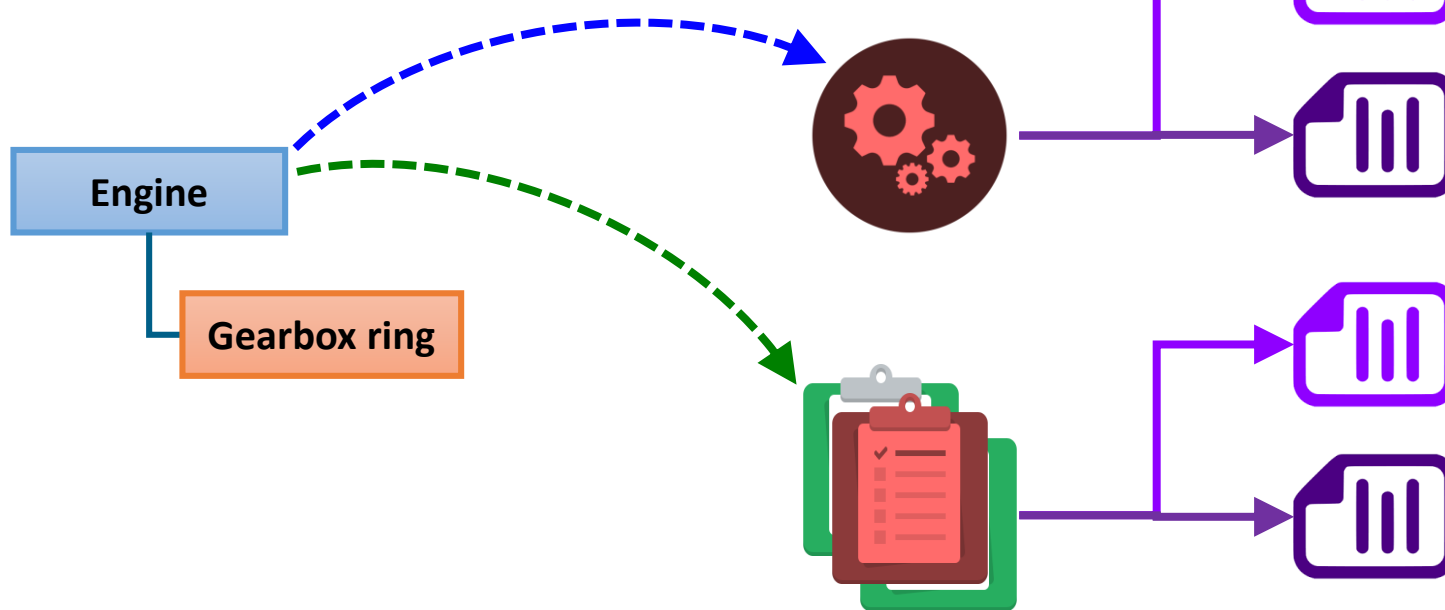
Change- and Configuration Management

MFC: N1234
PNR: ENG123-A4

include →

MFC: N1234
PNR: RING-A1

replaced by →

MFC: B3426
PNR: C23-88.1

Structure update

1. Structure

2. IPL / Material

3. Tasks

4. Data modules

Engine

Gearbox ring

Change- and Configuration Management

Revision A
DFP: Inner-tube
MFC: KT222
PNR: IT-001

Revision B
DFP: Inner – tube (black)
MFC: KT222
PNR: IT-001A

Material data update

Generated IPD Revision B

```
csn
  change ........ modify
  csn ........... D00000000A009
  ind ........... 3
  item .......... 009
  mark .......... 1
  isn ........... 9 1 EAKT222IT-001A · · Inner- tube (black)· MB
    isn ......... 00A
  rfs
    value ....... 1
  qna ........... 1
  mfc ........... KT222
  pnr ........... IT-001A
  pas
    dfp ......... Inner- tube (black)
    uoi ......... EA
    str ......... 0
  pas
```

Generated Procedure Revision B

```
spare
  change ........ modify
  mark .......... 1
  nomen ......... Inner - tube (black)
  identno ....... Inner - tube (black)Part KT222/IT-001A2
    mfc ......... KT222
    pnr ......... IT-001A
  identno
  qty ........... 2
    uom ......... EA
spare
```
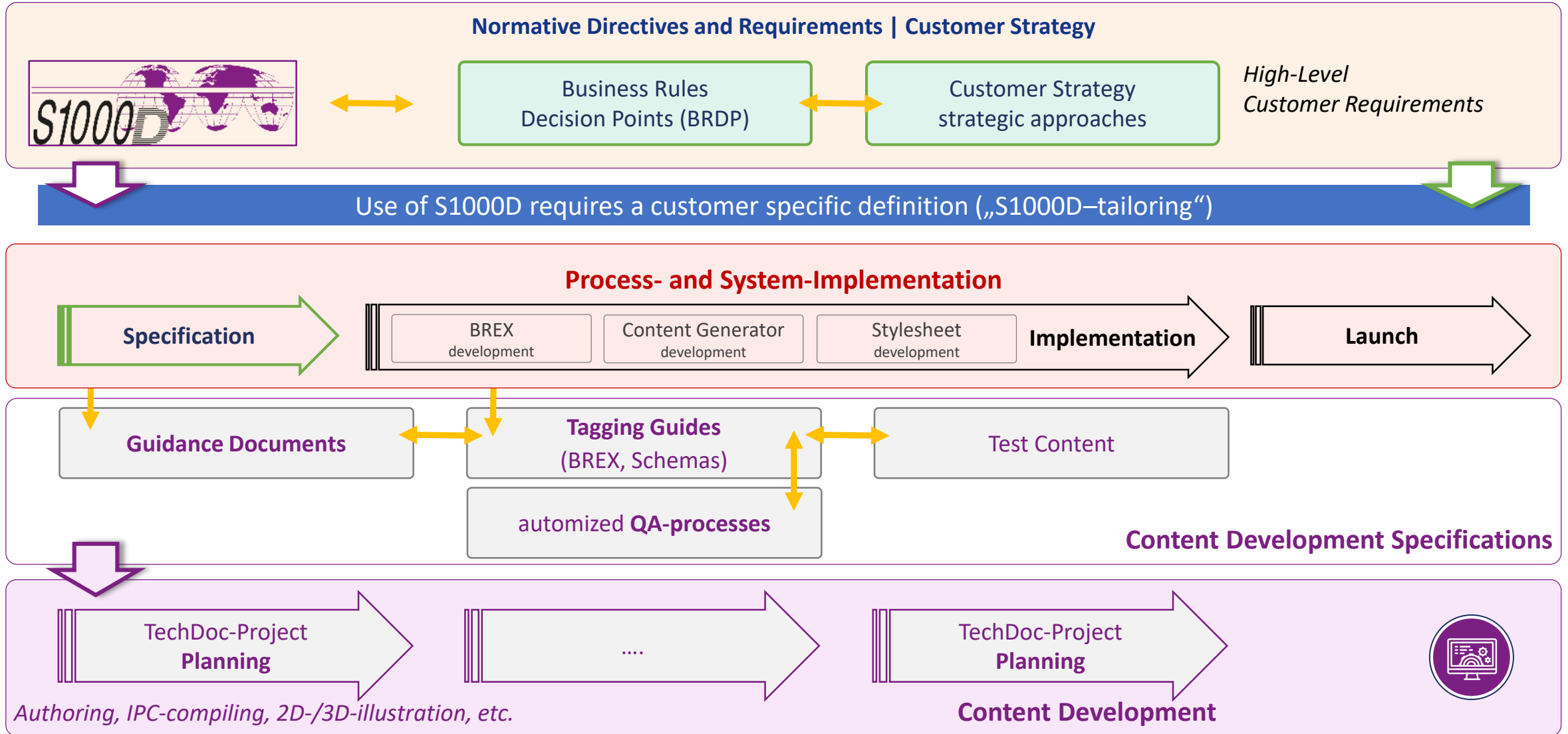
Automatic change tracking in DMs based on Revisions

Tagging-Guideline and Writing-Procedures

Normative Directives and Requirements | Customer Strategy

| Business Rules Decision Points (BRDP) | ⟷ | Customer Strategy strategic approaches |

High-Level Customer Requirements

Use of S1000D requires a customer specific definition („S1000D–tailoring")

Process- and System-Implementation

Specification → BREX development | Content Generator development | Stylesheet development | **Implementation** → **Launch**

Guidance Documents ⟷ **Tagging Guides** (BREX, Schemas) ⟷ Test Content

automized **QA-processes**

Content Development Specifications

TechDoc-Project **Planning** → .... → TechDoc-Project **Planning**

Authoring, IPC-compiling, 2D-/3D-illustration, etc.

Content Development

Tagging-Guideline and Writing-Procedures

BREX

```
<structureObjectRule>
 <brDecisionRef brDecisionIdentNumber="BR-00071"/>
 <objectPath allowedObjectFlag="2">//maintLevel/@maintLevelCode</objectPath>
 <objectUse>Maintenance level</objectUse>
 <objectValue valueForm="single" valueAllowed="ml01">Level 1  (home)</objectValue>
 <objectValue valueForm="single" valueAllowed="ml02">Level 2 (authorized workshop)</objectValue>
</structureObjectRule>
<structureObjectRule>
 <brDecisionRef brDecisionIdentNumber="BR-00067"/>
 <objectPath allowedObjectFlag="0">//trade</objectPath>
 <objectUse>Element –trade- is forbidden</objectUse>
</structureObjectRule>
```
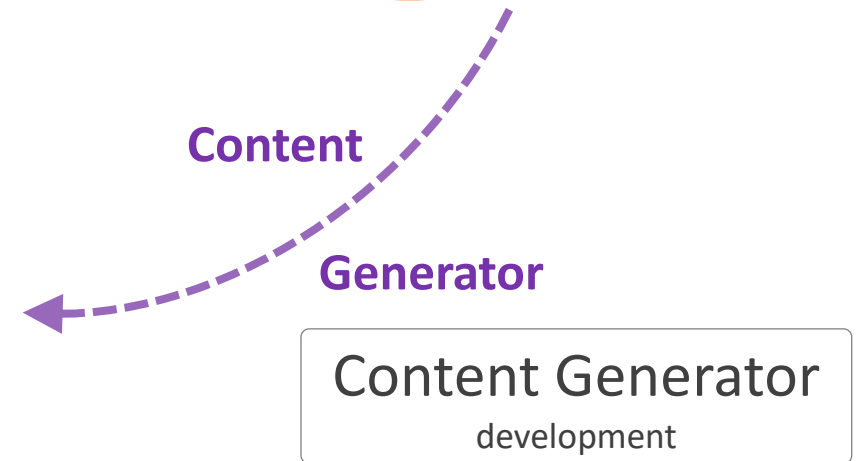
BREX

development

Tagging-Guideline and Writing-Procedures

- Rectifying Task
- Function (Infocode)
- Preliminary
  - **Maintenance (Level = 2)**
  - **Intervals (100 Flight Hours)**
  - **Personal (Position=1, Category=Mechanical Engineer, Skill=Beginner, Trade=AF999, Time=0,25h)**
  - Material
  - Safety
- Subtasks
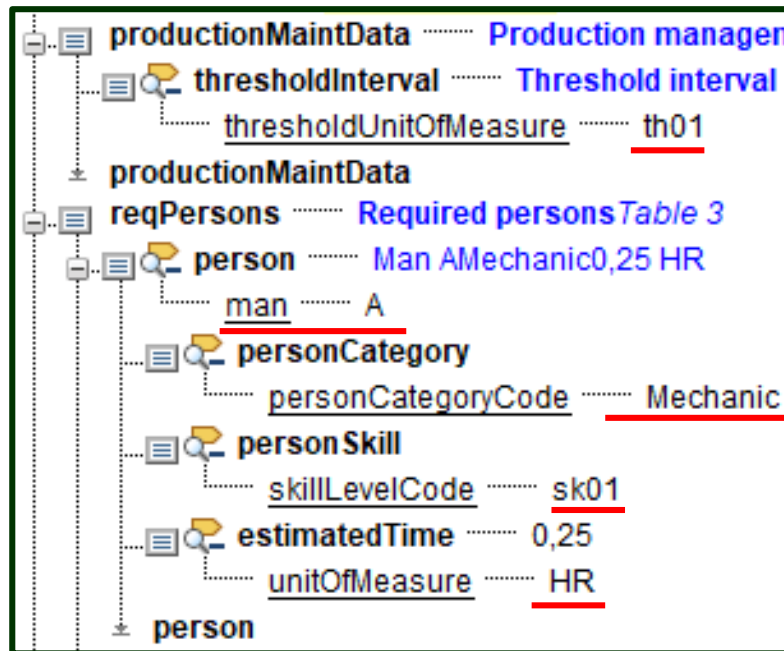
BREX

```
<structureObjectRule>
 <brDecisionRef brDecisionIdentNumber="BR-00071"/>
 <objectPath
allowedObjectFlag="2">//maintLevel/@maintLevelCode</obje
ctPath>
 <objectUse>Maintenance level</objectUse>
 <objectValue valueForm="single" valueAllowed="ml01">Level 1
(home)</objectValue>
 <objectValue valueForm="single" valueAllowed="ml02">Level 2
(authorized workshop)</objectValue>
</structureObjectRule>
<structureObjectRule>
 <brDecisionRef brDecisionIdentNumber="BR-00067"/>
 <objectPath allowedObjectFlag="0">//trade</objectPath>
 <objectUse>Element –trade- is forbidden</objectUse>
</structureObjectRule>
```

productionMaintData .... Production managem
  thresholdInterval .... Threshold interval
    thresholdUnitOfMeasure th01
productionMaintData
reqPersons .... Required persons *Table 3*
  person .... Man A Mechanic 0,25 HR
    man .... A
    personCategory
      personCategoryCode .... Mechanic
    personSkill
      skillLevelCode sk01
    estimatedTime 0,25
      unitOfMeasure .... HR
  person

Content

Generator

Content Generator
development

Tagging-Guideline and Writing-Procedures

Stylesheet

Project B

Stylesheet

Project A

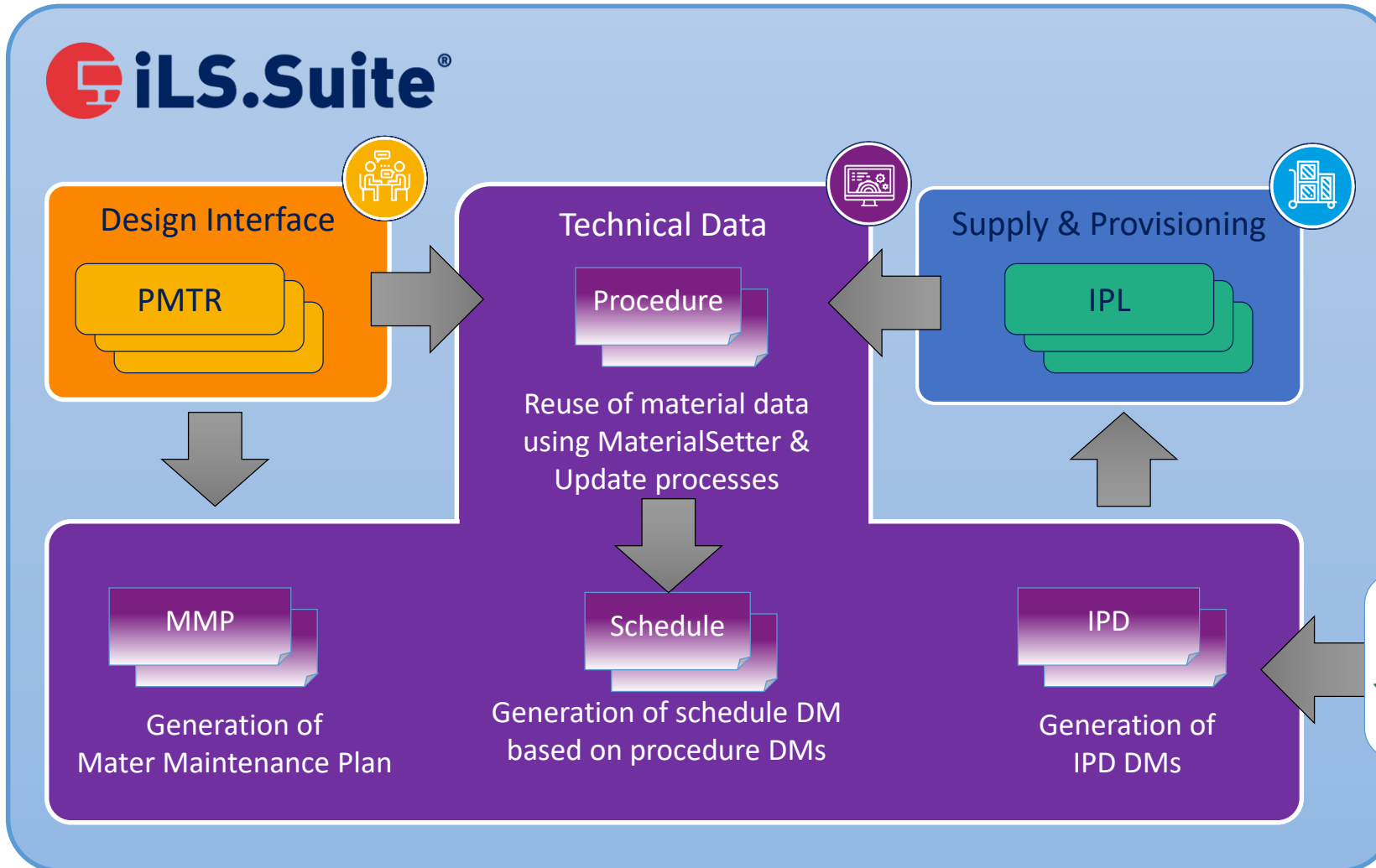**Stylesheet**
development

Challenges during implementation

- Definition of independently Tasks / IPLs

- Convincing the customer to create detailed guidelines

- Generation scripts and data mapping

- Project- / Install-Location specific characteristics

- Shift of work - less work for Authors – more for engineers

- Who is responsible for warning, caution & notes

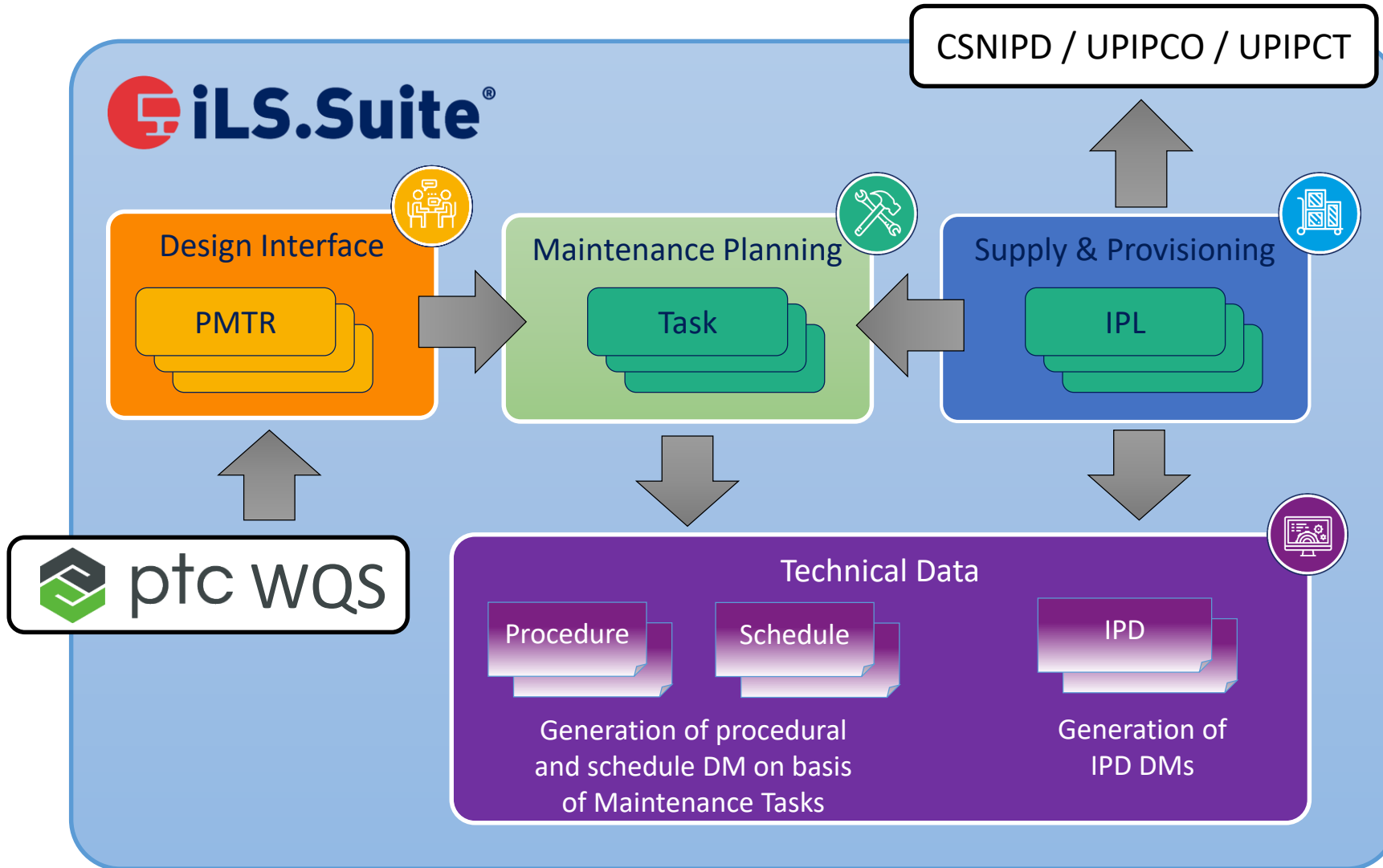- And many more ☺

Real world Aircraft examples

iLS.Suite®

Design Interface

PMTR

Technical Data

Procedure

Reuse of material data using MaterialSetter & Update processes

Supply & Provisioning

IPL

MMP

Generation of Mater Maintenance Plan

Schedule

Generation of schedule DM based on procedure DMs

IPD

Generation of IPD DMs

Swiss Aircraft Manufactor

SIEMENS
Cortona3D
TEAMCENTER

Real world Helicopter examples

iLS.Suite®

CSNIPD / UPIPCO / UPIPCT

Design Interface
- PMTR

Maintenance Planning
- Task

Supply & Provisioning
- IPL

ptc WQS

Technical Data
- Procedure
- Schedule

Generation of procedural and schedule DM on basis of Maintenance Tasks

- IPD

Generation of IPD DMs

Swiss & Dutch Helicopter Manufactor

Real world Submarine examples
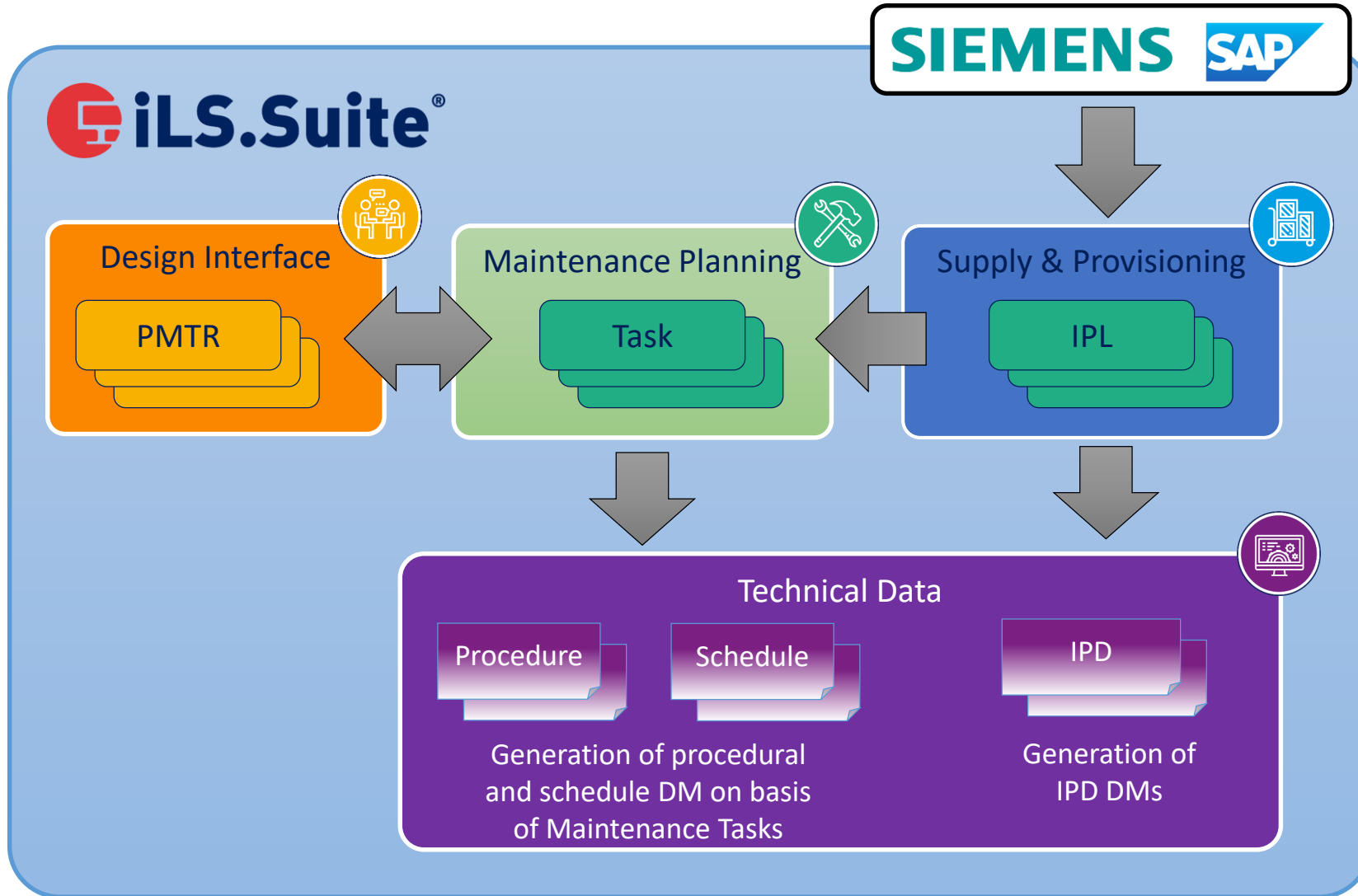
German Submarine Manufactor

Thank you

for your attention!

Questions?