

ARCaide: Revolution in assembly planning

Assembly planning intelligently automated



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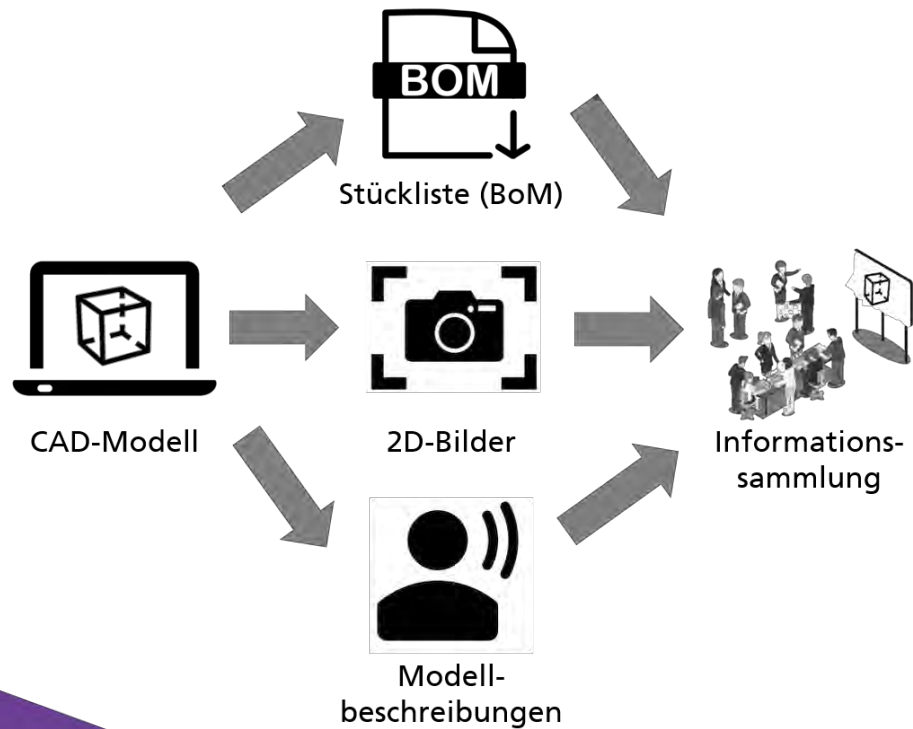
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The problem:
Inefficient assembly
planning

Assembly Planning Today

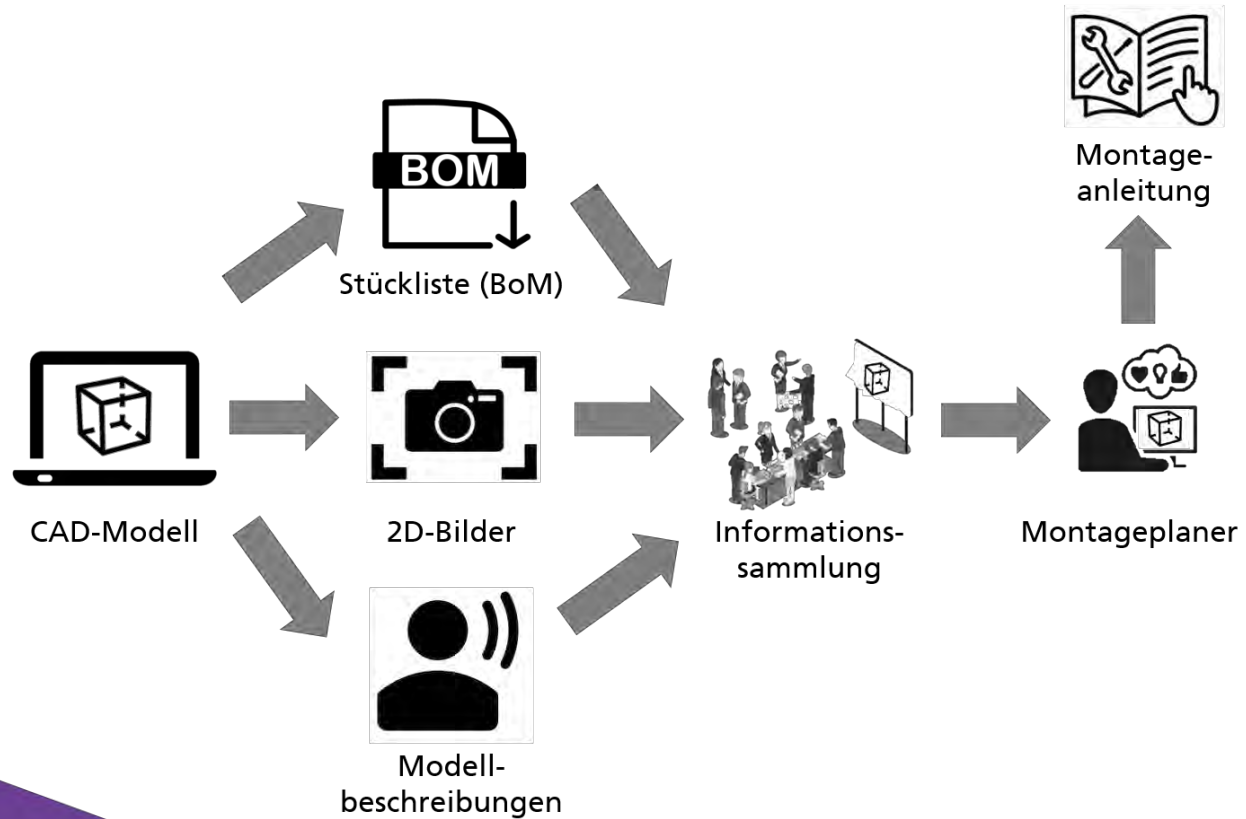
Screenshots and MS Word



Assembly Planning Today

Screenshots and MS Word

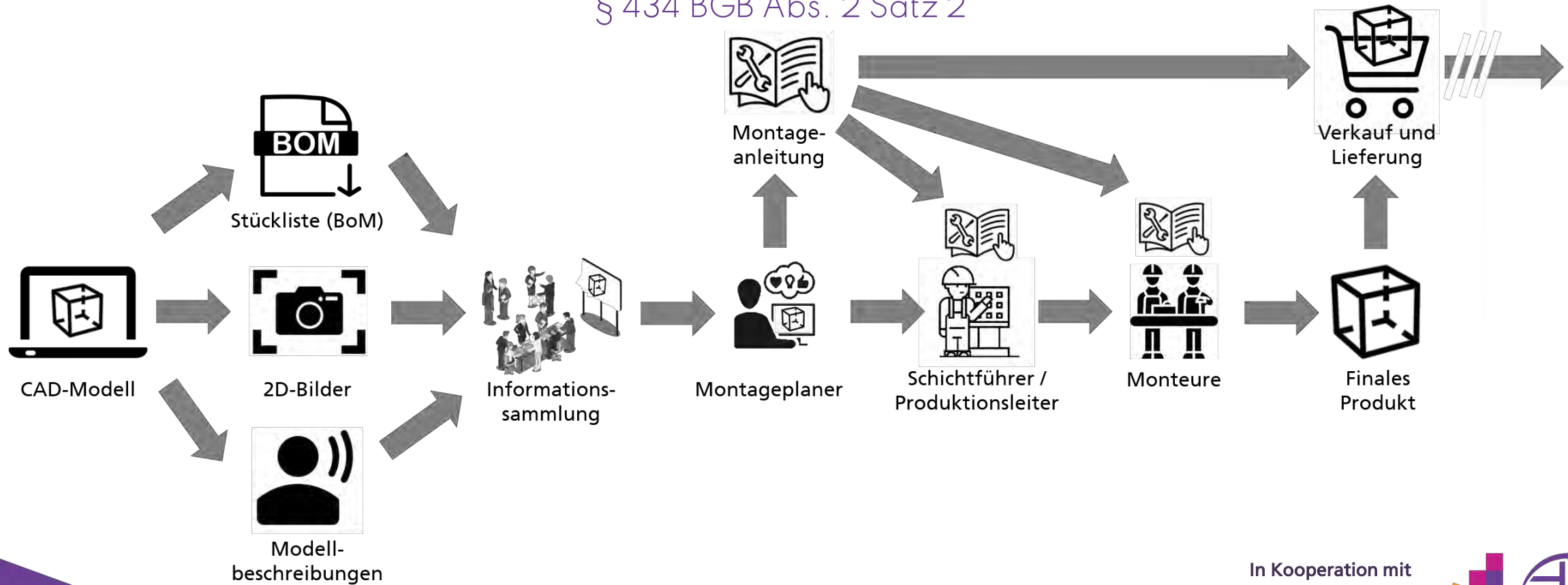
German civil code
§ 434 BGB Abs. 2 Satz 2



Assembly Planning Today

Screenshots and MS Word

German civil code
§ 434 BGB Abs. 2 Satz 2



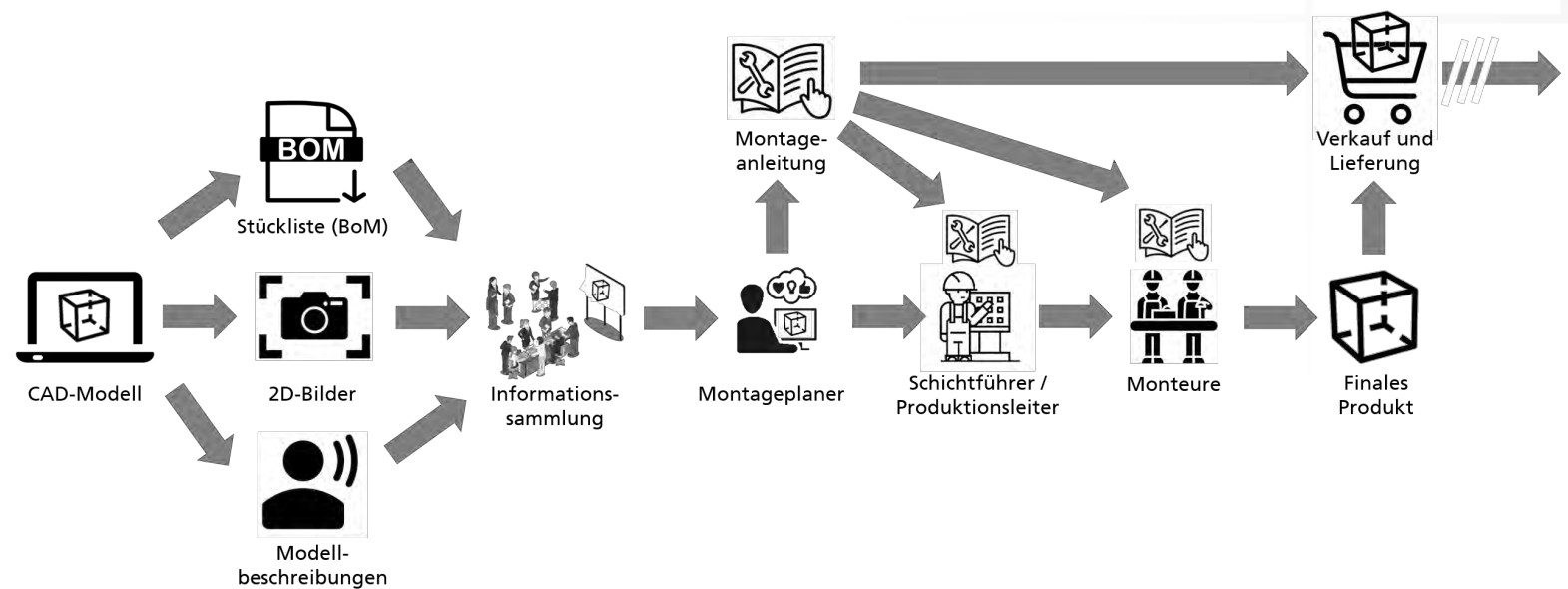
Assembly is extremely time and cost intensive

It's time for a change!

 up to 50%
of production time

 20% of total
product costs


 30-50% of
employee costs



The research: Automatic Generation of Assembly Sequences

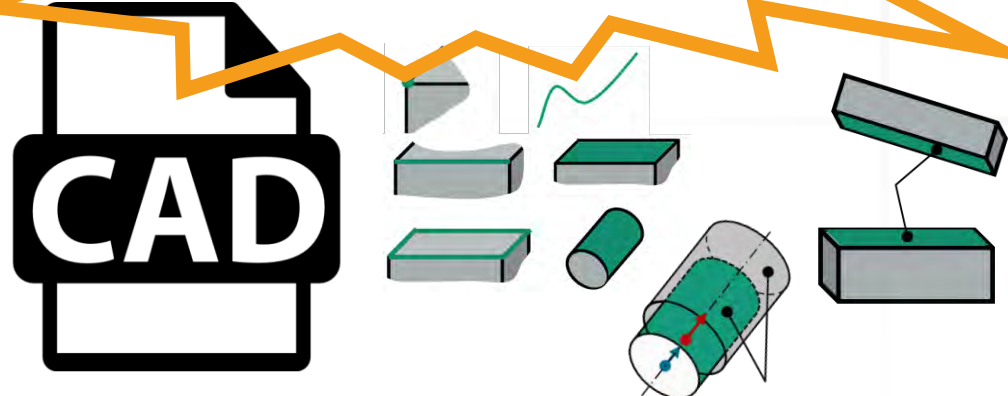
Solution approaches

Disassembly approaches



- Disassembly paths
- Mounting direction
- AND/OR graphs
- Preliminary work
- Contacts only
- Computing time

Feature-based approaches



- Differentiation of assembly relationships
- CAD systems are feature rich
- High-level features
- Complexity
- CAD dependency
- No approaches available that can generate all features

Published:

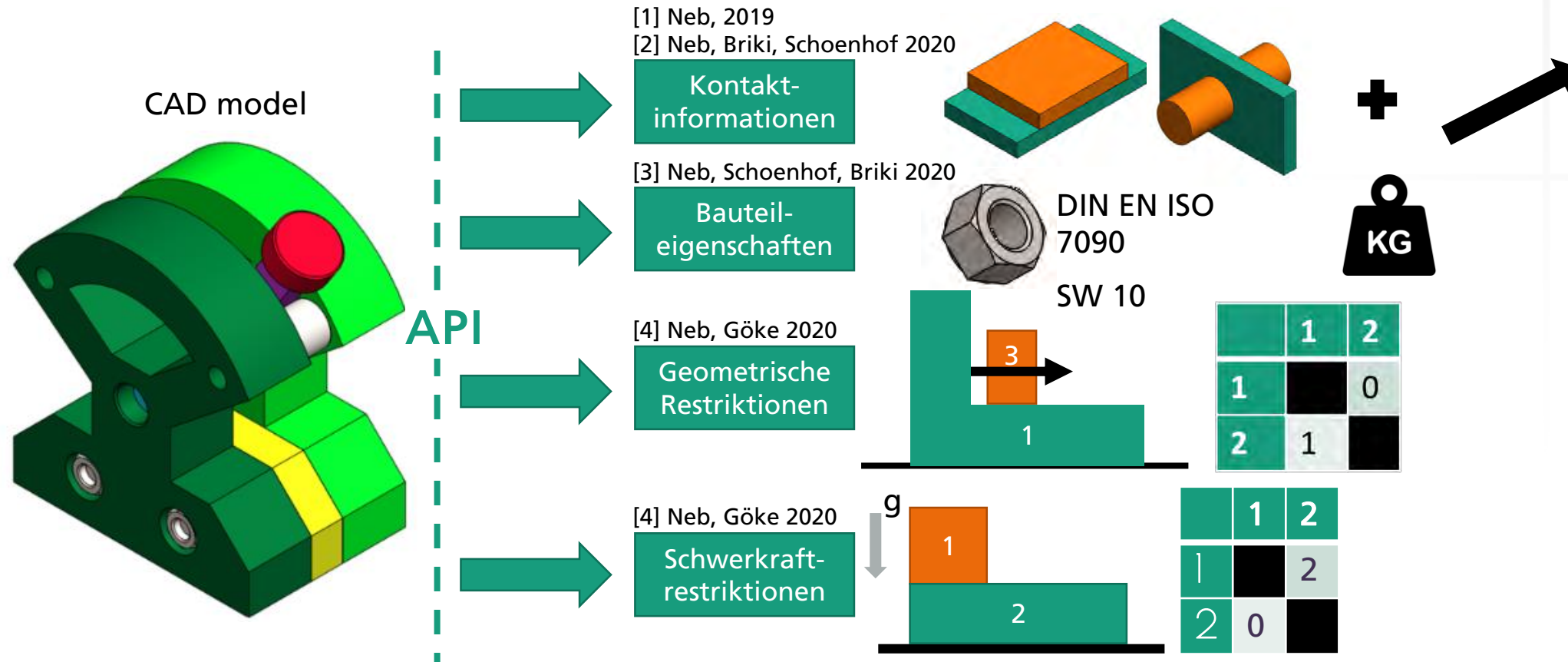
Neb A. Review on Approaches to Generate Assembly Sequences by Extraction of Assembly Features from 3D Models; 81, 2019, pp. 856-861

In Kooperation mit
 **Fraunhofer**
IPA

 **ARCAiDE**
Assembly Systems

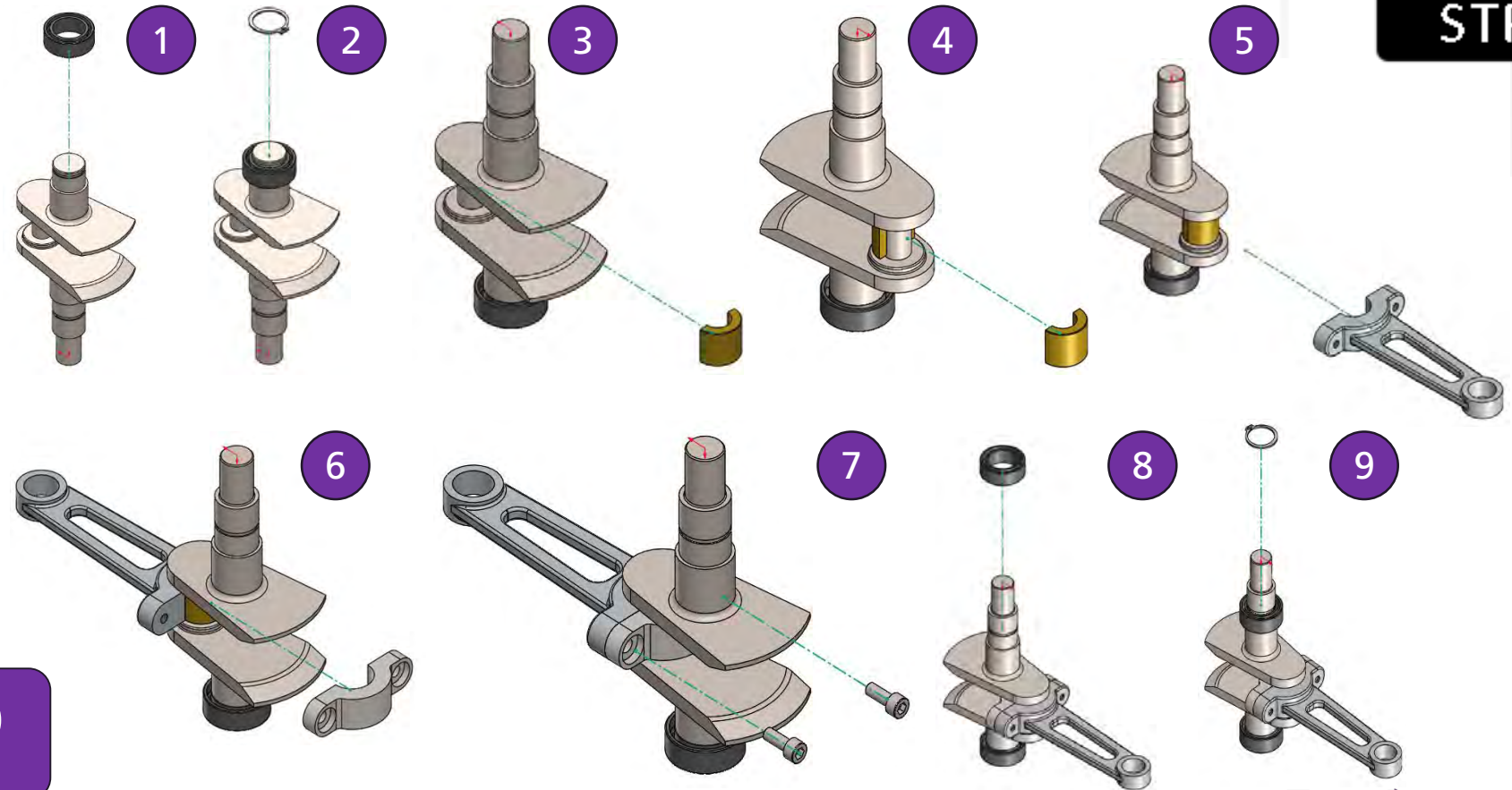
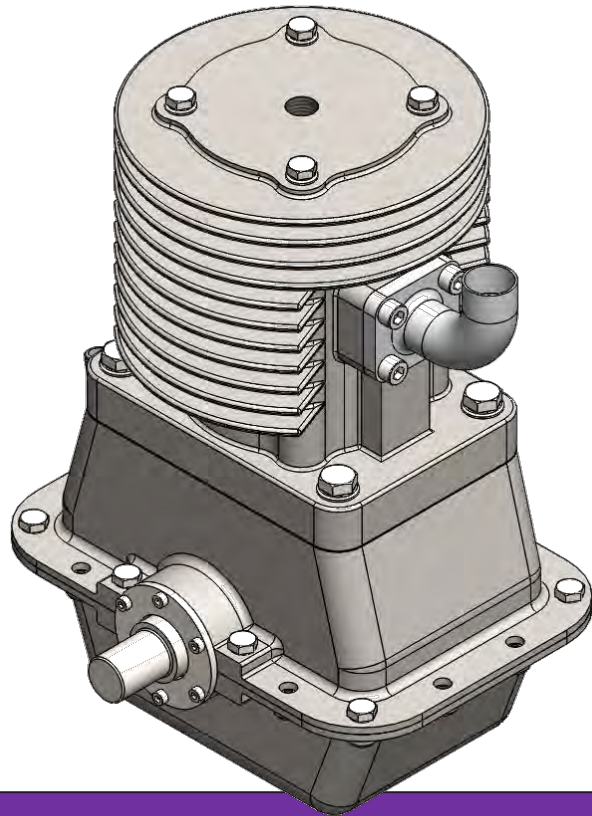
Analysis of CAD models

Results



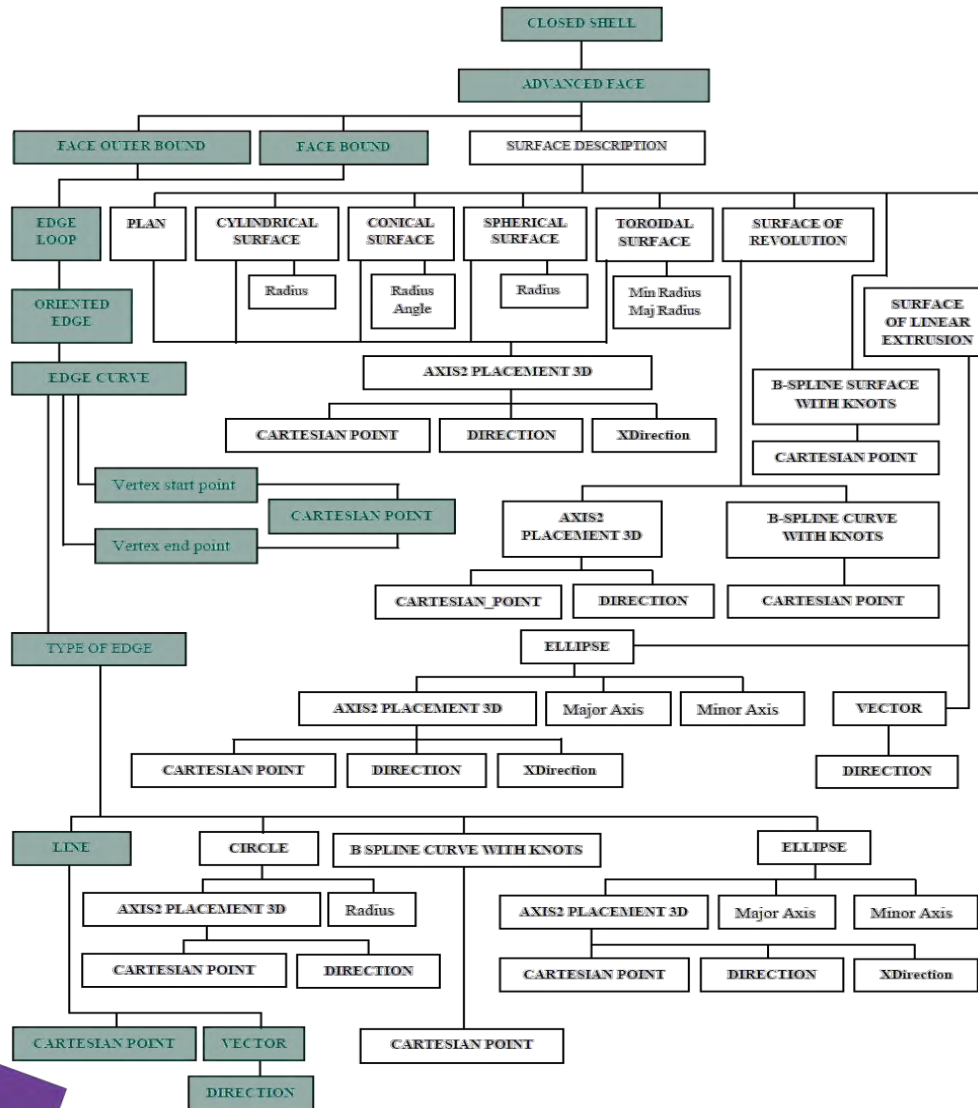
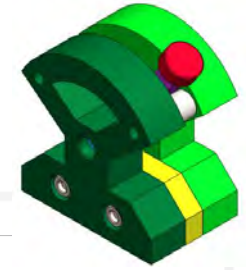
Automatic generation of assembly sequences

Automatically generated example



$59! = \sim 1,4 \times 10^{80}$

Analysis of STEP Models



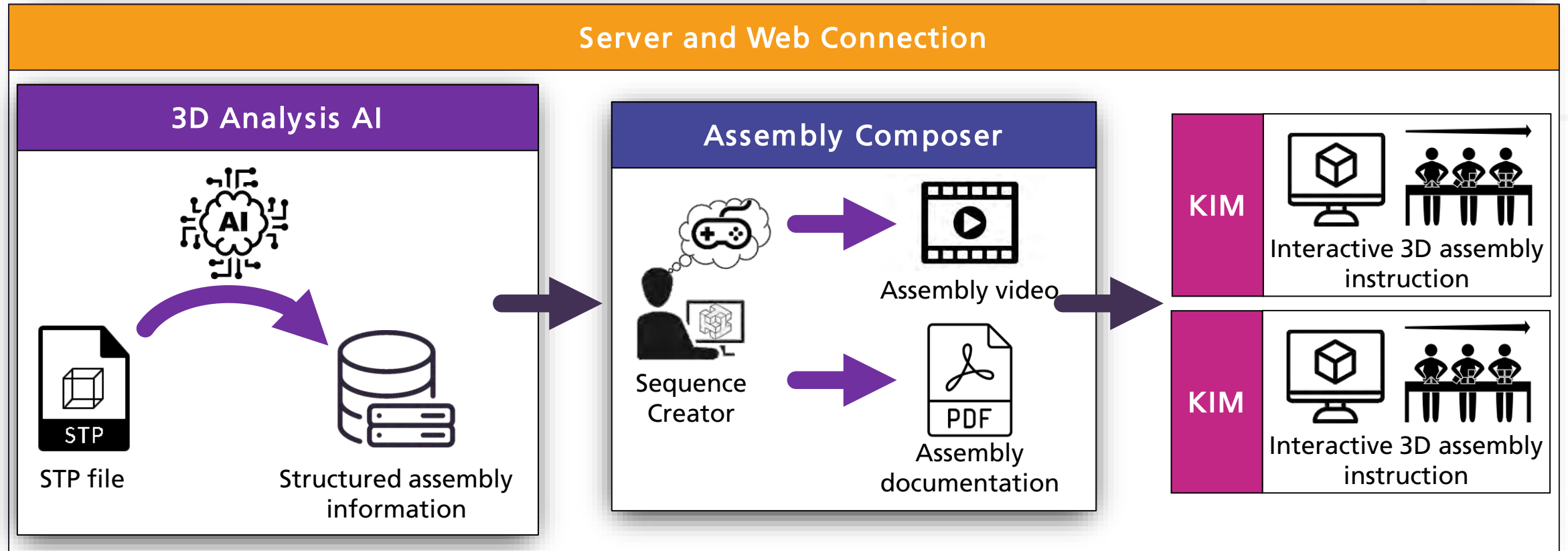
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#13407 = ORIENTED_EDGE ( 'NONE', *, *, #11872, .F. );
#13408 = PLANE ( 'NONE', #11094 );
#13409 = DIRECTION ( 'NONE', ( -0.000000000000000000, -0.000000000000000000, -1.000000000000000000 ) );
#13410 = AXIS2_PLACEMENT_3D ( 'NONE', #9880, #8416, #10870 );
#13411 = DIRECTION ( 'NONE', ( -0.7071067811865480200, -0.7071067811865470200, -0.000000000000000000 ) );
#13412 = DIRECTION ( 'NONE', ( 0.000000000000000000, -1.000000000000000000, 0.000000000000000000 ) );
#13413 = ORIENTED_EDGE ( 'NONE', *, *, #512, .T. );
#13414 = ORIENTED_EDGE ( 'NONE', *, *, #10056, .T. );
#13415 = CYLINDRICAL_SURFACE ( 'NONE', #8328, 5.000000000000000000 );
#13416 = CARTESIAN_POINT ( 'NONE', ( 31.6799999999999300, 7.20000000000000200, 2.00000000000000000 ) );
#13417 = CARTESIAN_POINT ( 'NONE', ( 11.00000000000000700, 80.0000000000000000, 0.00000000000000000 ) );
#13418 = UNCERTAINTY_MEASURE_WITH_UNIT ( LENGTH_MEASURE( 1.00000000000000100E-005 ), #1631, 'distance_accuracy' );
#13419 = LINE ( 'NONE', #2215, #11293 );
#13420 = CARTESIAN_POINT ( 'NONE', ( 59.8827083333332600, 5.42666666666666700, 2.00000000000000000 ) );
#13421 = EDGE_CURVE ( 'NONE', #11645, #13202, #10081, .T. );
#13422 = ADVANCED_FACE ( 'NONE', ( #9747 ), #4378, .F. );
#13423 = ORIENTED_EDGE ( 'NONE', *, *, #11890, .F. );
#13424 = CARTESIAN_POINT ( 'NONE', ( 84.3333333333338500, 4.33333333333318800, -2.16666666666663900 ) );
#13425 = CARTESIAN_POINT ( 'NONE', ( 59.50857738020127400, 4.489723830154052700, 2.00000000000000000 ) );
#13426 = CARTESIAN_POINT ( 'NONE', ( 28.49968690694424800, 5.277646733805418900, 0.00000000000000000 ) );
#13427 = EDGE_CURVE ( 'NONE', #3440, #13012, #7955, .T. );
#13428 = NEXT_ASSEMBLY_USAGE_OCCURRENCE ( 'NAU01', ' ', ' ', #1977, #591, $ );
#13429 = NEXT_ASSEMBLY_USAGE_OCCURRENCE ( 'NAU02', ' ', ' ', #1977, #13327, $ );
#13430 = NEXT_ASSEMBLY_USAGE_OCCURRENCE ( 'NAU03', ' ', ' ', #1977, #12634, $ );
#13431 = NEXT_ASSEMBLY_USAGE_OCCURRENCE ( 'NAU04', ' ', ' ', #1977, #11930, $ );
#13432 = NEXT_ASSEMBLY_USAGE_OCCURRENCE ( 'NAU05', ' ', ' ', #1977, #11230, $ );
#13433 = NEXT_ASSEMBLY_USAGE_OCCURRENCE ( 'NAU06', ' ', ' ', #1977, #10530, $ );
#13434 = NEXT_ASSEMBLY_USAGE_OCCURRENCE ( 'NAU07', ' ', ' ', #1977, #9846, $ );
#13435 = NEXT_ASSEMBLY_USAGE_OCCURRENCE ( 'NAU08', ' ', ' ', #1977, #591, $ );
#13436 = NEXT_ASSEMBLY_USAGE_OCCURRENCE ( 'NAU09', ' ', ' ', #1977, #11930, $ );
#13437 = NEXT_ASSEMBLY_USAGE_OCCURRENCE ( 'NAU010', ' ', ' ', #1977, #9846, $ );
ENDSEC;
END-ISO-10303-21;
    
```

The spin-off:
ARCAiDE Assembly Systems
GmbH i. G.

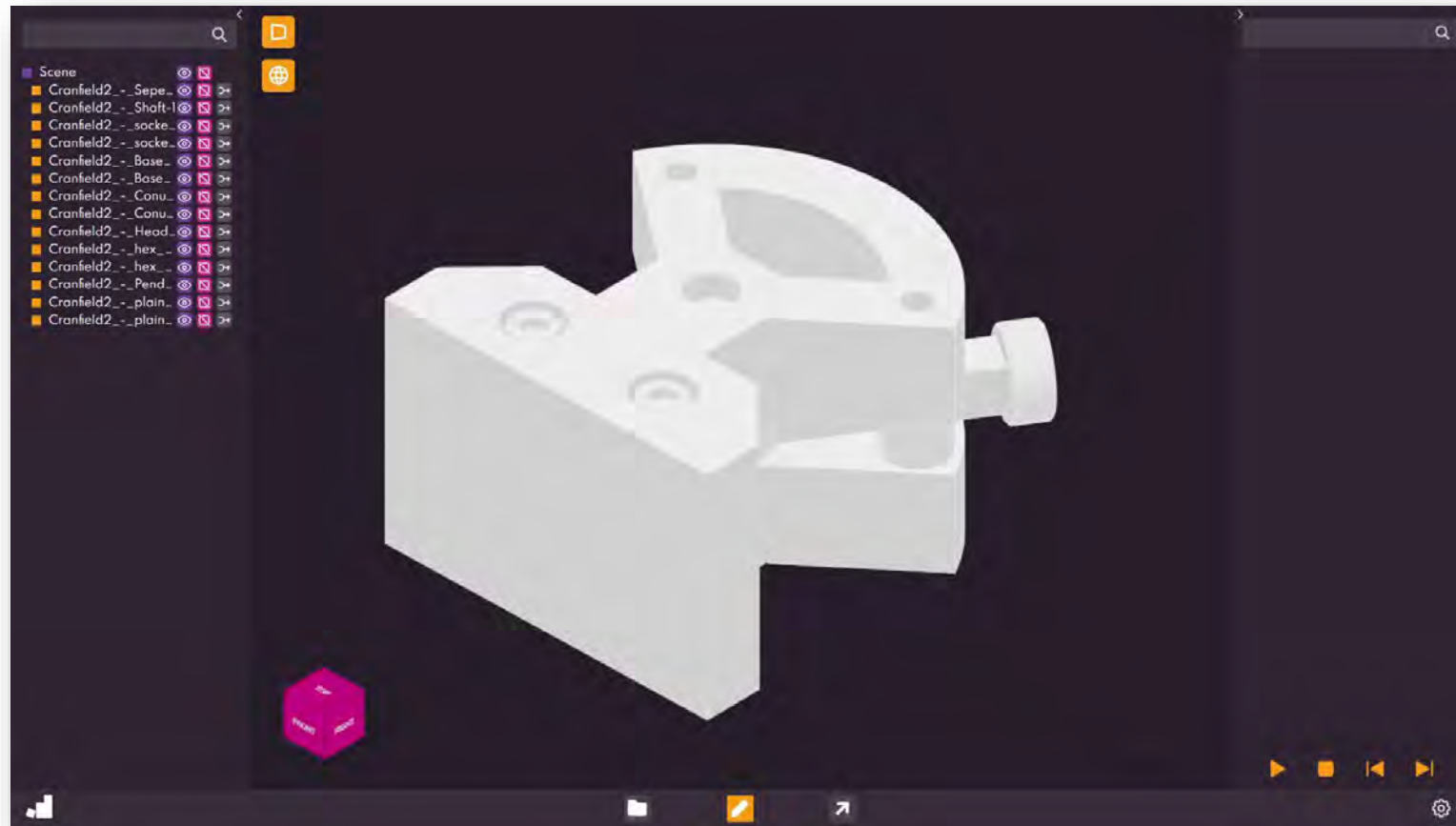
Overview

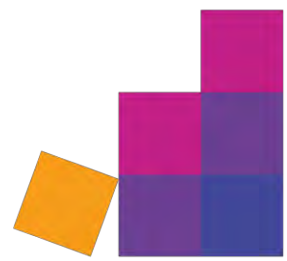
ARCaide Assembly Suite



Example

ARCaide Assembly Suite





ARCAiDE

Assembly Systems

Wir setzen die Zukunft zusammen.

www.arcaide.de



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Strategy and corporate governance

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