

Using Geometric Part Search to Integrate Processes and Companies

geolus SHAPE in Interaction with NX, Teamcenter, and JT

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Premium Partners:



Microsoft

Agenda

- **Company Profile**
- Geometric Part Search
- Further Applications
- Conclusions

The Capgemini Group at a Glance

Capgemini Differentiators

- Market leadership that uniquely positions Capgemini to link consulting and outsourcing
- Integrated account management to meet your global needs with local presence around the world in business consulting, AD&I, ERP implementation and outsourcing.
- Strategic alliances with all major application and technology providers that can be leveraged to provide complete customer solutions.
- Innovative deal structures that maximize clients' ROI (e.g., performance based deal structures).
- Proprietary Project Acceleration Capabilities.

Capgemini Spectrum of Solutions

Technology Services

- Technology Architecture and Design
- Applications and Data Development and Integration
- Infrastructure Engineering

Business Consulting Services

- Strategy & Transformation
- Customer Relationship Management
- Supply Chain Management
- Finance/Employee Transformation

Outsourcing

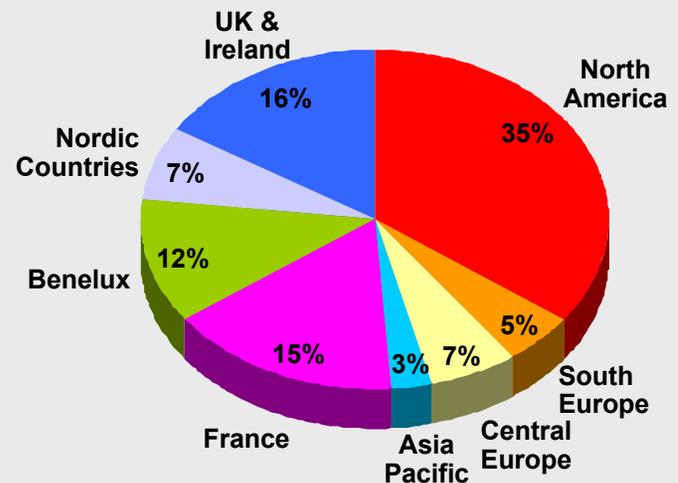
- Applications Management
- Infrastructure Management
- Business Process Management



Key facts (2004)

- Staff: over 55,000 people worldwide
- Revenue: \$7.0 billion

Operating in 8 regions and over 30 countries



sd&m at a Glance



Core competence

- Software solutions and IT consulting

Clients

- Major companies from a wide range of sectors, including Automotive, Aerospace, Financial, Insurance, Logistics, and Telecommunication

Key facts (2004)

- Founded: 1982
- Staff: 950 people
- Revenue: \$160 million

sd&m is an integrated member of Capgemini Technology Services



- We provide know-how across the whole value chain
- Our global network enables worldwide customer care

Agenda

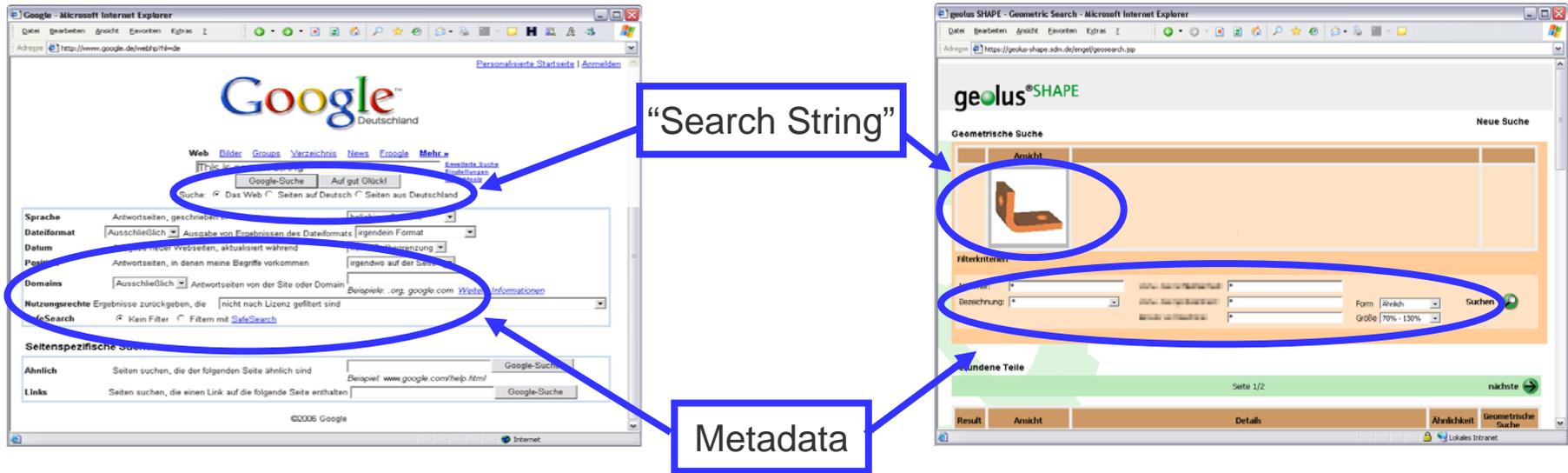
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The Vision behind Geometric Search

**Handle, analyze, and monitor
a wide spectrum of 3D CAD parts
simply and efficiently**

geolus[®]SHAPE

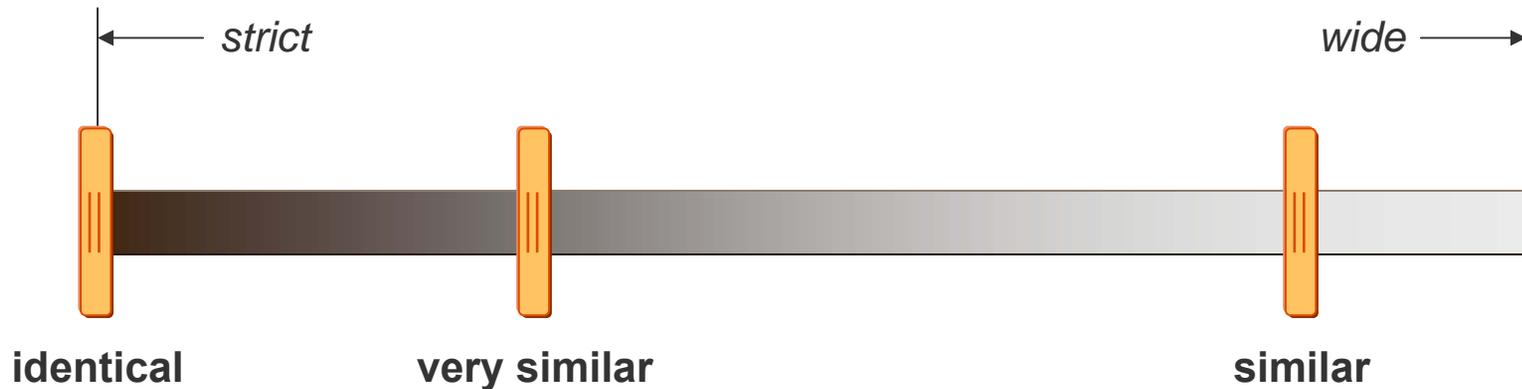
Text Search vs. Geometric Search Engines



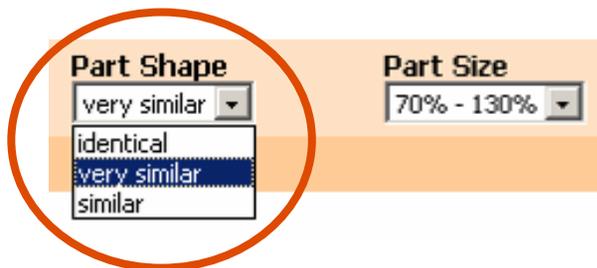
- Both approaches operate 100% automatically
- Both approaches provide interactive response times
- Both approaches can handle huge data volumes
- But, only geometric search is independent from documentation standards, quality, and language

Search Algorithms and Tolerances are to be Bundled into Domain-Specific Search Profiles

- Default Similarity Measures for “Part Shape”



- User-defined Adjustment at Query Time



Geometric Search Allows Designers to “Query by Draft” against the Enterprise Part Database

The central web browser window displays the 'geolus SHAPE' search interface. The search criteria are 'ONLINE DRAFT'. The search results table is as follows:

| Rang | Ansicht | ID | Beschreibung | Ähnlichkeit | Ähnlichkeitssuche |
|------|---------|-----|--------------|---------------------------------|-------------------|
| 1 | | 096 | PART 479 | Größe: 100,00% Form: 0,00000 | |
| 2 | | | | | |
| 3 | | 916 | SAU/PEL 1391 | Größe: 88,29% Form: 0,00000 | |

1 First draft of a new model

< 5 minutes to draw

2 Geometrical search across all parts

< 30 seconds to find

3 Download of a similar model
Ideal basis for a modified design

System Integration at Koenig & Bauer

SAP
Sourcing Data

TEAMCENTER
ENGINEERING
Part
Master Data

TIFF
Drawings

geolus®**SHAPE**

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Gefundene Ähnlichkeitsteile

| lfd. Nr. | 3D-Ansicht | Identmerkmale | mehr Details | Ähnlichkeitsmaß | 3D aktiv |
|----------|------------|--|----------------|----------------------------------|----------|
| 1 | | L2672212/0 ZYLINDER ADVU 50-15-P Teletyp: 21 Kurzbezeichnung: ADVU 50-15-P-A Norm: Werkstoff: Hersteller/Lieferant: Teilefamilie: 60700 | [EK] [TE] [TF] | Form: 0,008266 Größe: 71,00% | |
| 2 | | L2672332/A ZYLINDER ADVU 80-35-P Teletyp: 21 Kurzbezeichnung: ADVU 80-35-P-A Norm: Werkstoff: Hersteller/Lieferant: Teilefamilie: 60700 | [EK] [TE] [TF] | Form: 0,009579 Größe: 111,00% | |
| 3 | | L2672258/A ZYLINDER ADVU 80-25-P Teletyp: 21 Kurzbezeichnung: ADVU 80-25-P-A Norm: Werkstoff: Hersteller/Lieferant: Teilefamilie: 60700 | [EK] [TE] [TF] | Form: 0,019540 Größe: 111,00% | |

TEAMCENTER
VISUALIZATION
VisMockup

NX

Geometric Search Supports Target Pricing for Procurement and Sales Departments

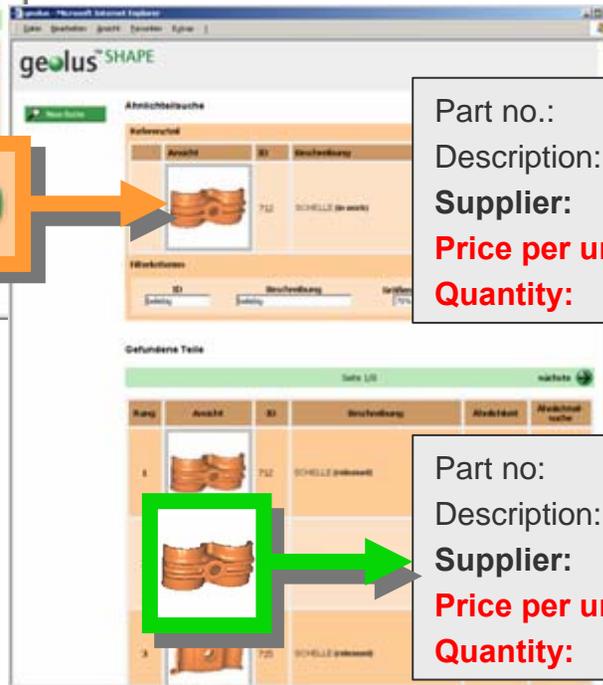


1 Alphanumeric search across approved parts
< 1 minute per query

2

Geometrical search across all parts

approx. 1 second for retrieval



Part no.: A1
Description: abc
Supplier: S1
Price per unit: 4 \$
Quantity: 50,000

Part no.: A2
Description: xyz
Supplier: S2
Price per unit: 2 \$
Quantity: 5,000

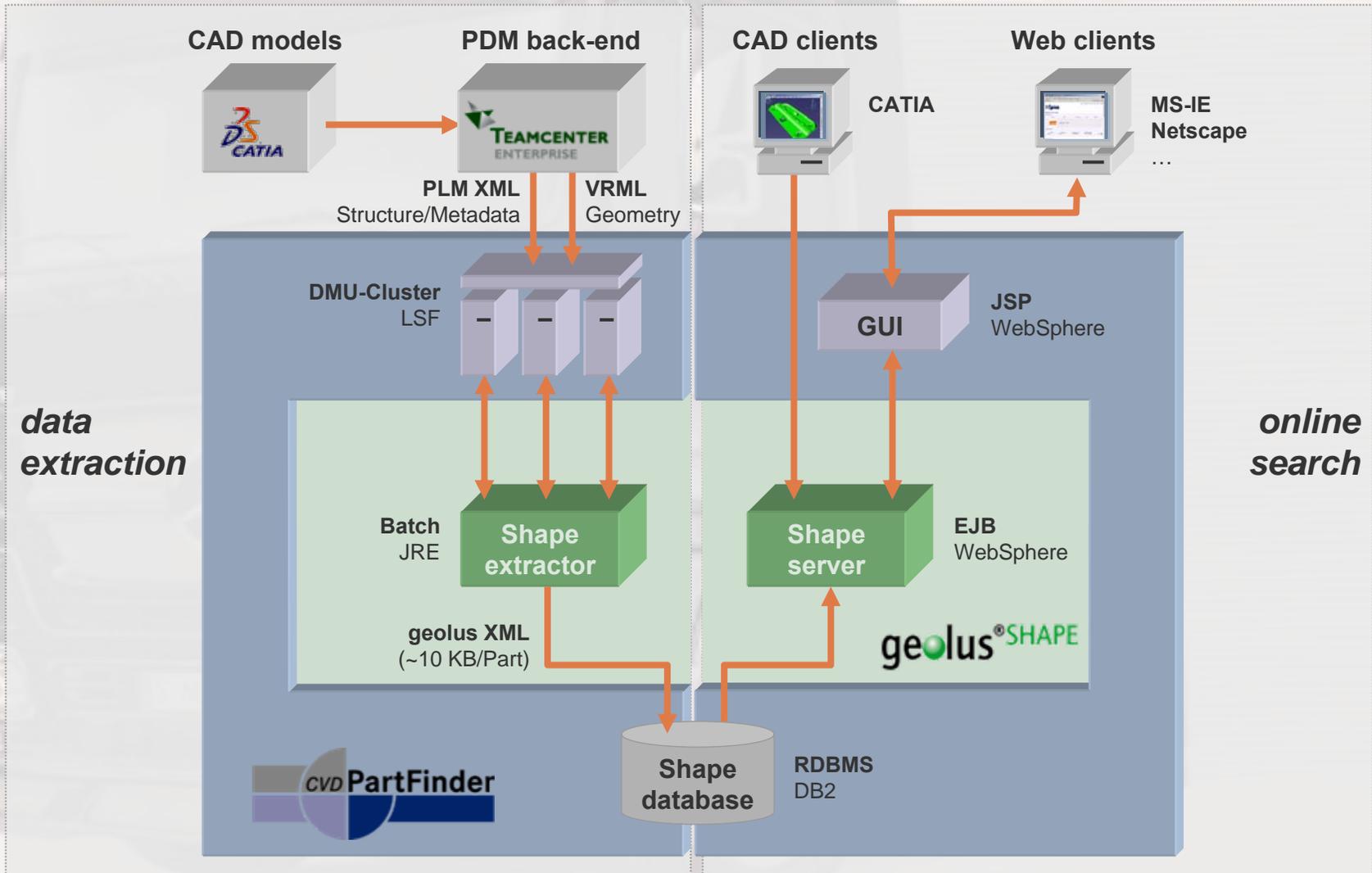
Difference: 2 \$

3

Price comparison

Potential benefit:
 $50,000 \times 2 \$ = 100,000 \$$

System Integration at DaimlerChrysler



Automatic Data Extraction Runs Weekly and Processes the Added and Changed Parts Only

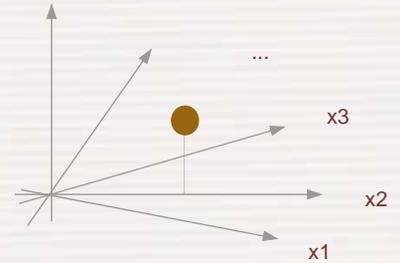


CAD model
(native)
1,000 KB



DMU model
(JT*, VRML, STL)
100 KB

geolus[®]SHAPE



Geometric Fingerprint
as of 5 KB



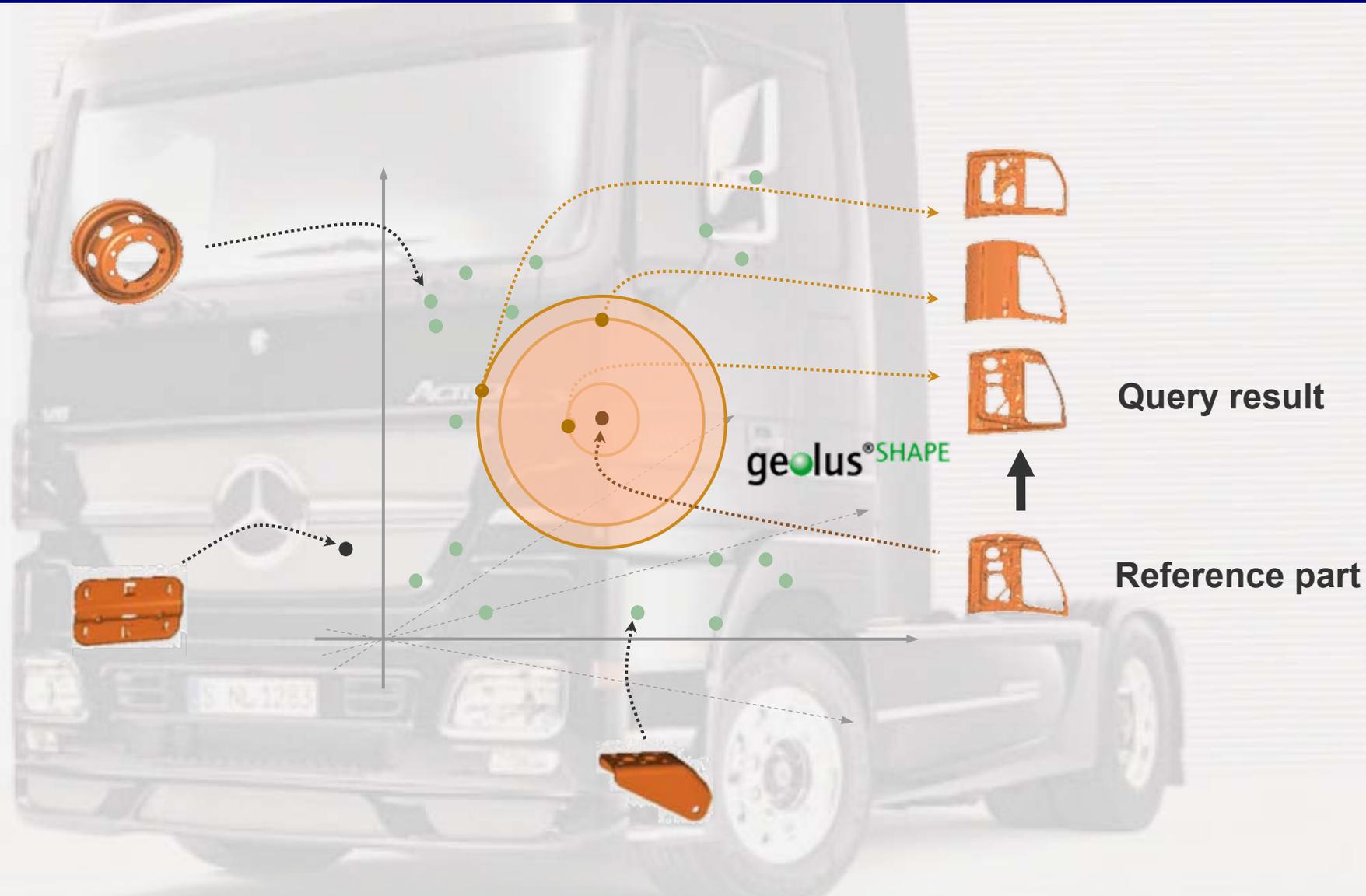
Thumbnail
as of 5 KB



geolus XML

* Assemblies and/or parts

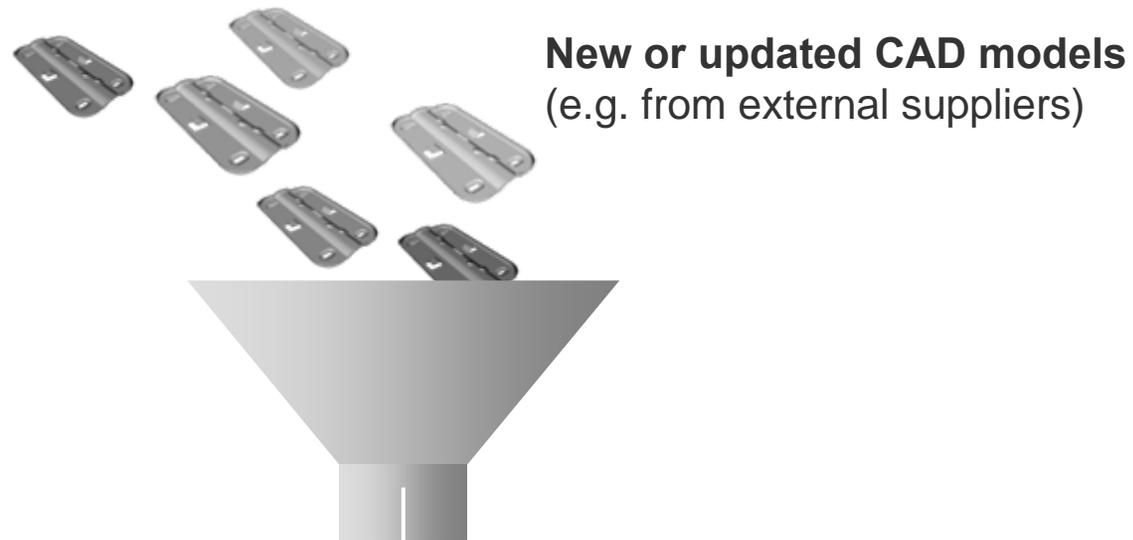
The Online Search is Available 24x6 and Runs Against the Extracted Geometric Fingerprints



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A “Geometric Firewall” Protects the Part Database from Duplicate Insertions and Unnoticed Changes

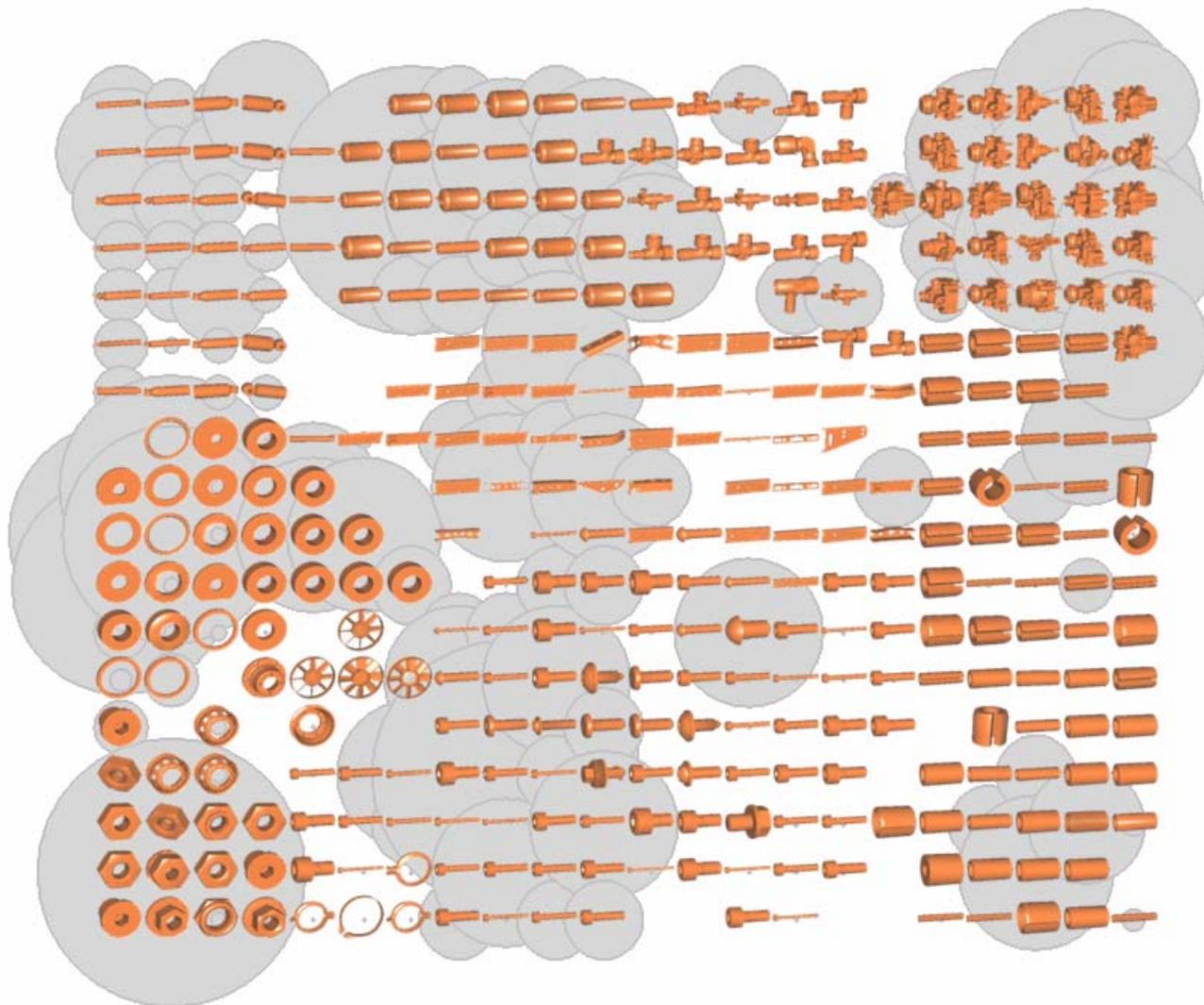


Identical geometry was found
(risk of creating a duplicate)
→ Reconcile with existing master data?



Present geometry is outdated
(shape difference out of tolerance)
→ Redo downstream processes?
(e.g. DMU, FEM calculation, ...)

Geometric Part Maps Provide Instant Overview to Integrate Internal and External Part Databases



**10,000 parts
at a glance**

Legend:

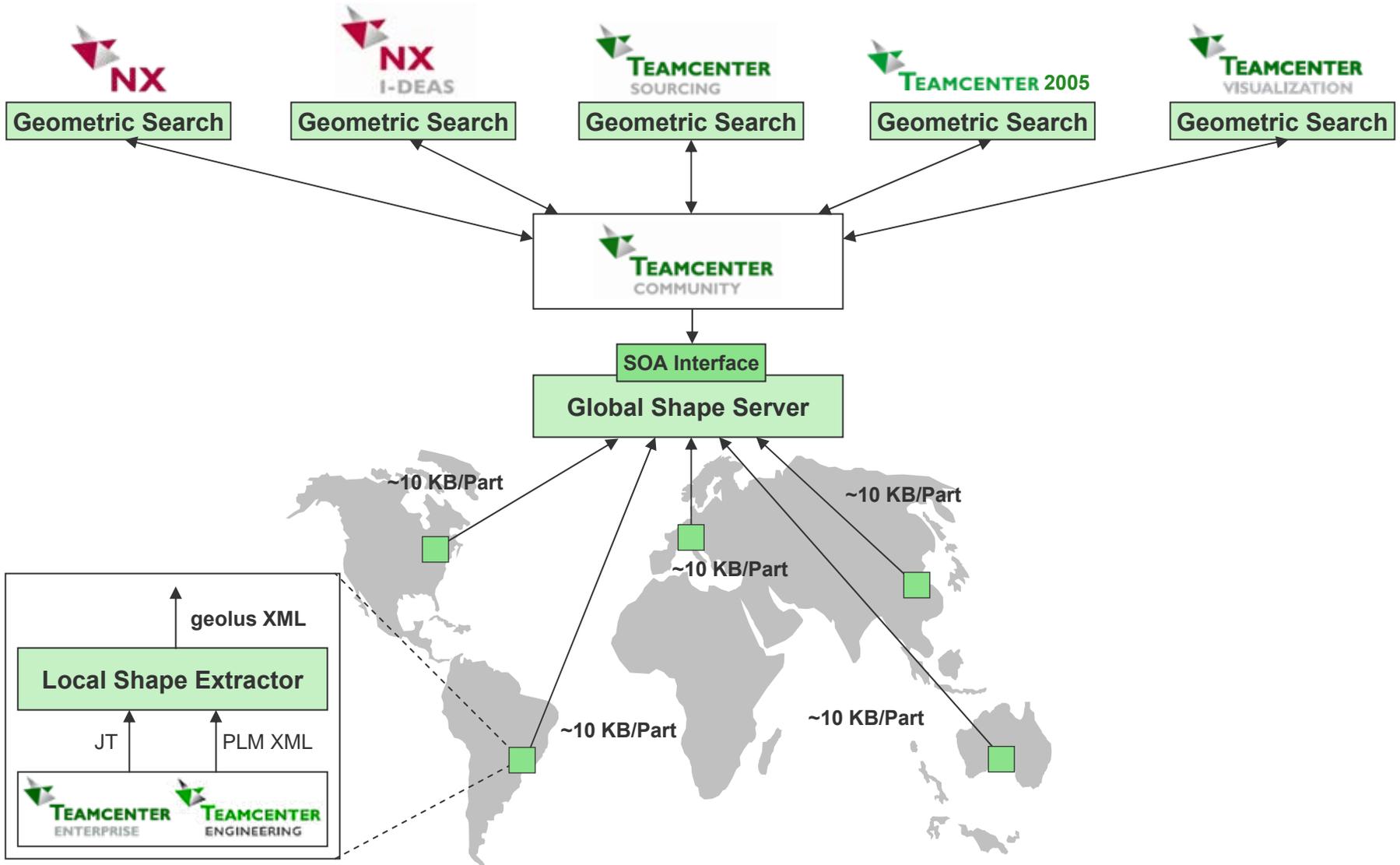


Representative part for
a group of similar parts



Number of parts
represented

For Global Companies, We Propose a Service-Based Integration of Geometric Search



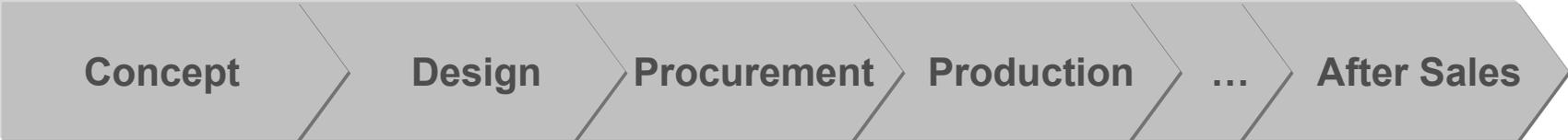
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Properly Embedded, Geometric Search Can Be Used in All Stages of the Product Life Cycle



Find similar or identical parts across the enterprise(s)



Metadata Search and Geometric Search Perfectly Complement Each Other

Metadata Search

- Covers material, weight and other important part properties
- Describes part function and usage
- Well suited for standard parts

- Contains incomplete, ambiguous, or incorrect classifications
- Can not handle inconsistent documentation standards and languages
- Fails for complex custom parts

Geometric Search

- Requires a geometric part representation (e.g. 3D model)
- Fails if geometry does not define the function (e.g. for pure electronic components)

- Gives instant and consistent access to all existing parts by shape
- Is independent from documentation standards and languages
- Well suited for complex custom parts

Thank You for Your Attention!
Questions?

?

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:)