

DATA DRIVEN ARCHITECTURE, ENGINEERING AND
CONSTRUCTION INDUSTRY

CONTEXT IS KING

IST DIE ERDE FLACH ODER RUND?



WURDE DIE WAHL 2020 GESTOHLLEN ODER NICHT?



**THE WEB FOLLOWS
THE AAA PRINCIPLE**

Anyone can say Anything about Anything

A MULTITUDE OF ASSUMPTIONS

Weniger Co2 wenn wir Holz verwenden?

Ist die Tür Rot oder Orange?

Wurde die Wand entfernt?

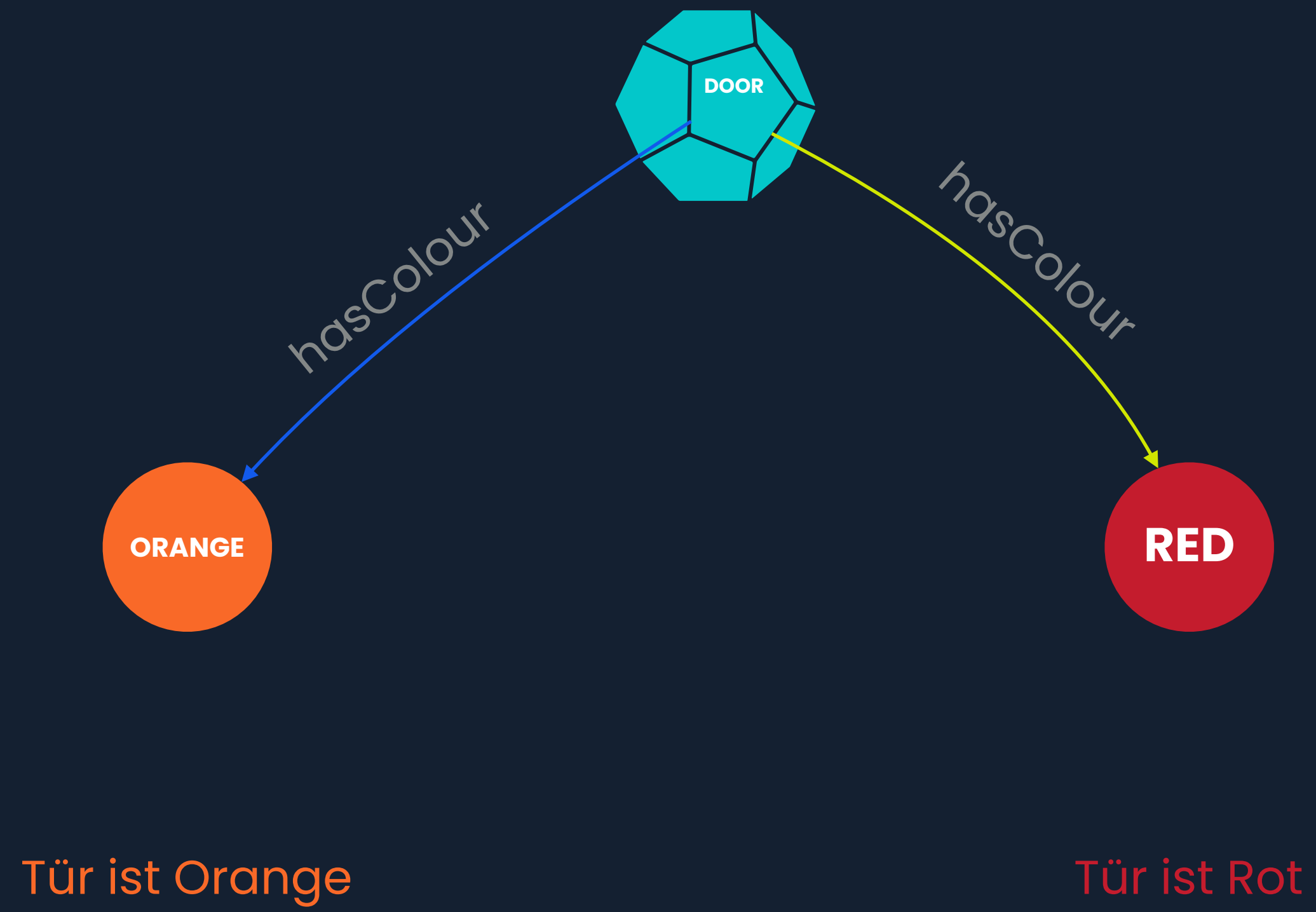


Es kommt darauf an wie man rechnet!

Es kommt drauf an wen man fragt!

Es kommt auf die Version des Plan an!

RED OR ORANGE?



M

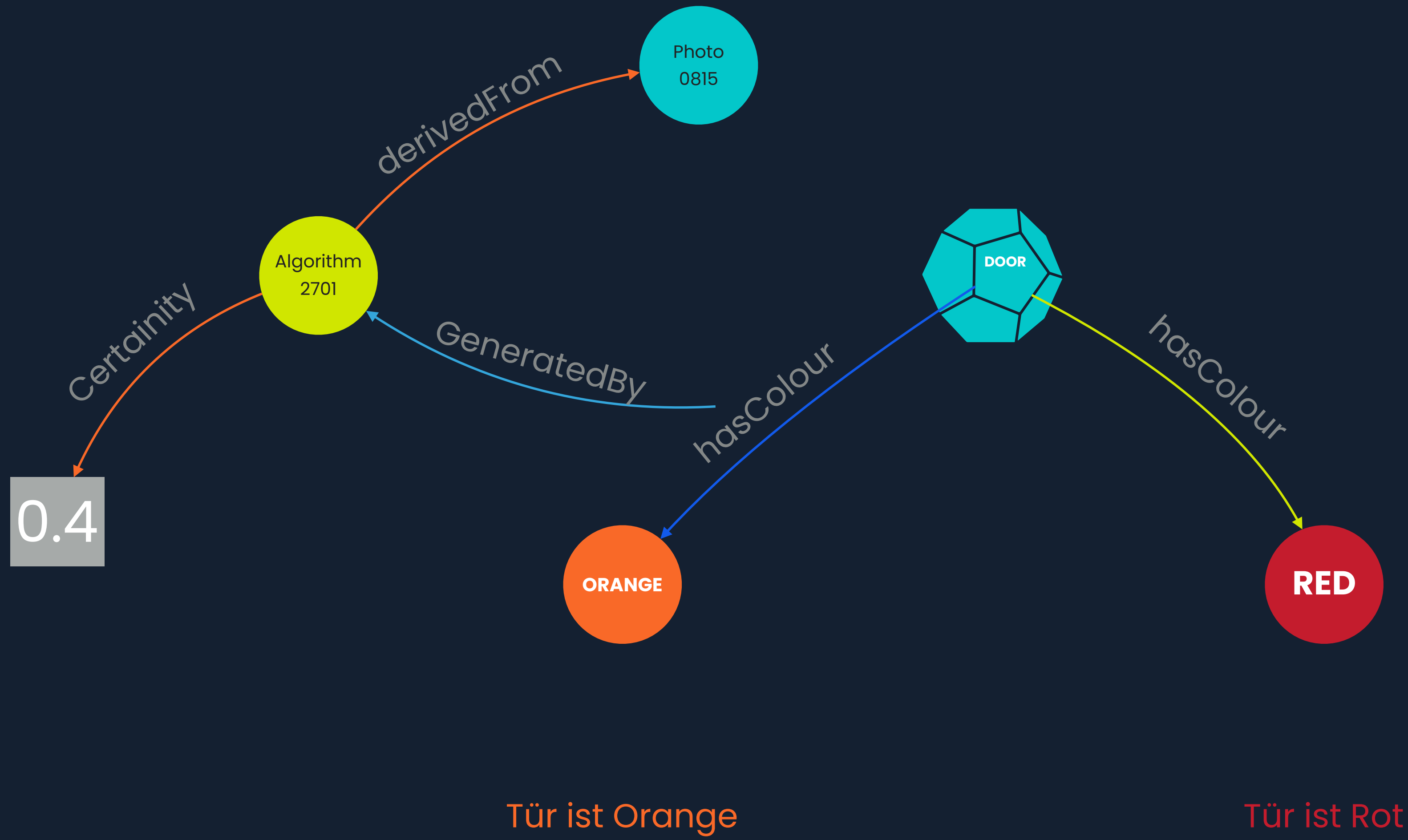
Given the below information,
which color would you trust the door to have?



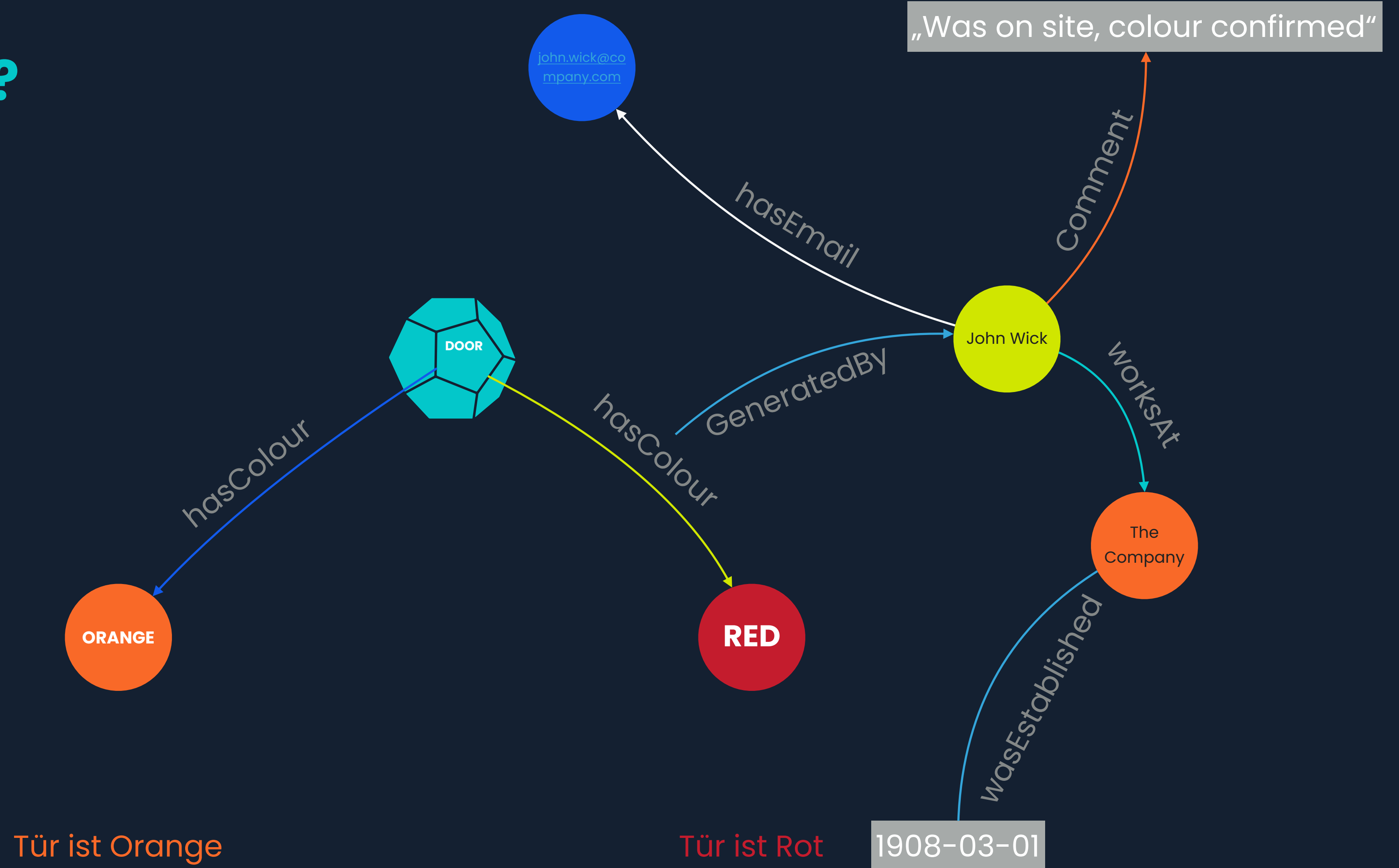
<Door> hasColor "Red"



RED OR ORANGE?



RED OR ORANGE?



M

Given the below information, which color would you trust the door to have? ▼

<Door> hasColor "Red" .

<Door> hasColor "Orange"



Three horizontal bars representing a progress or selection scale. The top bar is filled with a gradient from dark grey to light blue. The middle bar is filled with a gradient from light blue to dark grey. The bottom bar is filled with a gradient from light blue to dark grey, but it is shorter than the other two bars, ending about halfway across the width of the question area.



CONTEXT IS KING



Anyone

TRIPLES?



REMEMBER 1994?



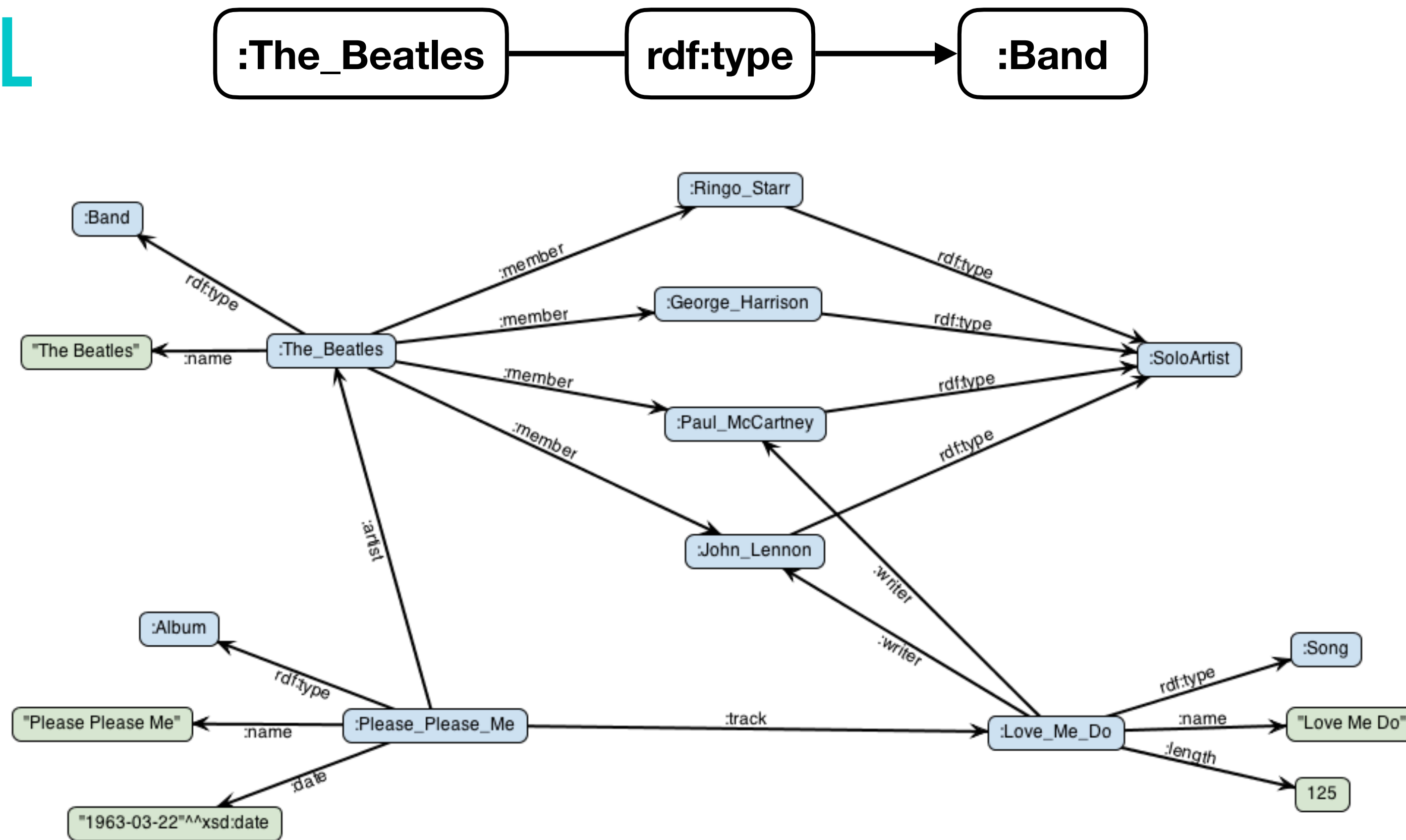
- **Arts and Humanities**
Architecture, Photography, Literature...
- **Business and Economy [Xtra!]**
Companies, Investing, Employment...
- **Computers and Internet [Xtra!]**
Internet, WWW, Software, Multimedia...
- **Education**
Universities, K-12, College Entrance...
- **Entertainment [Xtra!]**
Cool Links, Movies, Music, Humor...
- **News and Media [Xtra!]**
Current Events, Magazines, TV, Newspaper
- **Recreation and Sports [Xtra!]**
Sports, Games, Travel, Autos, Outdoors...
- **Reference**
Libraries, Dictionaries, Phone Numbers...
- **Regional**
Countries, Regions, U.S. States...
- **Science**
CS, Biology, Astronomy, Engineering...

RDF DATA MODEL

RDF (**Resource Description Framework**) is the standard model used in linked data to express data with its semantic annotation. It has the form of a triple, composed of a Subject, Predicate and Object.

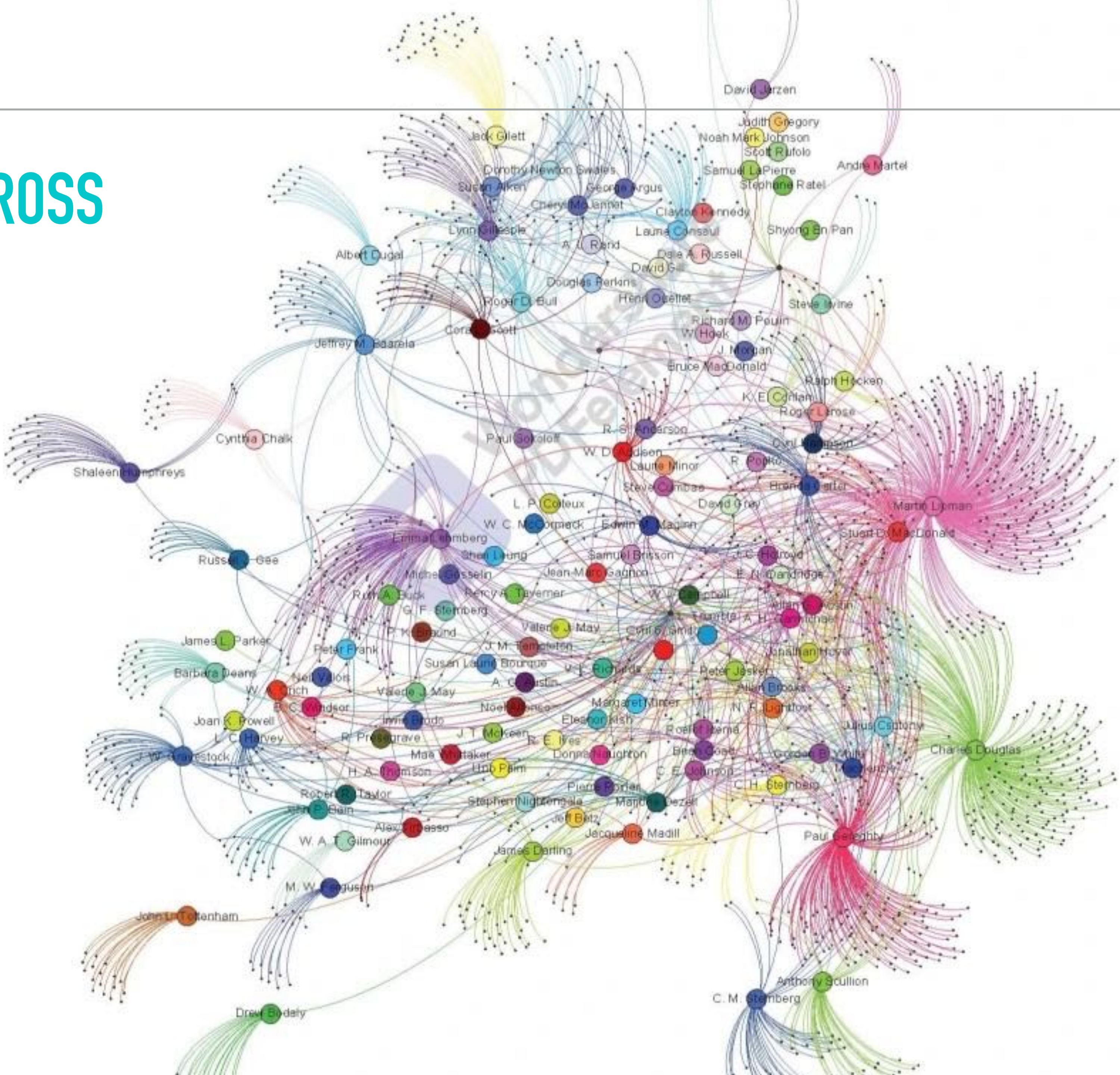


RDF DATA MODEL



The Resource Description Framework (RDF) is a World Wide Web Consortium (W3C) standard originally designed as a data model for metadata. It became a general method for description and exchange of graph data and is an excellent way to store and pass relations.

SEHR SEHR GROSS



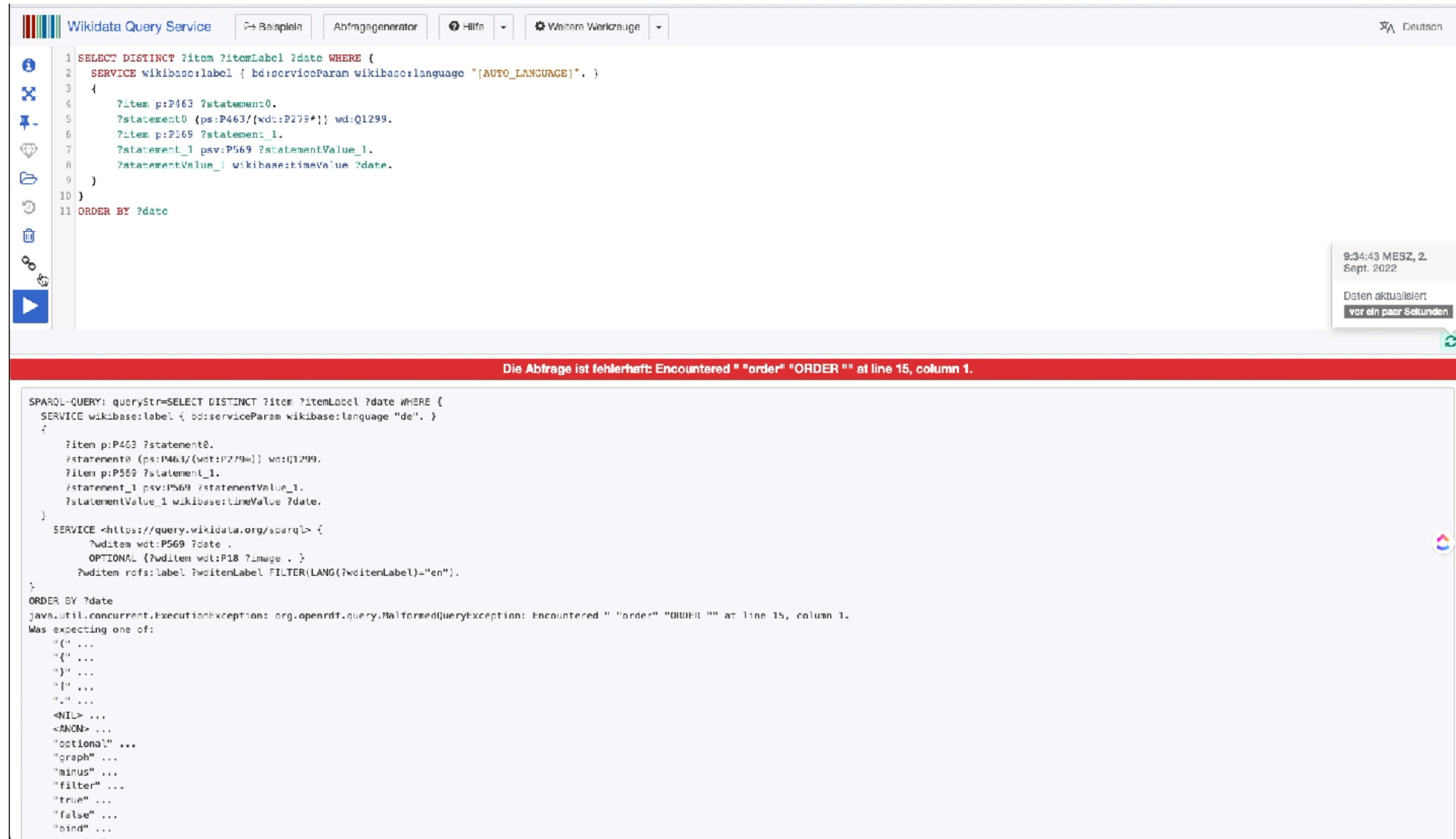
FOLLOWING PREDEFINED ROUTES

The screenshot shows the German Wikipedia page for 'The Beatles'. A blue callout bubble with the word 'MEMBER' points to the 'Letzte Besetzung' table in the right-hand sidebar. The article text is partially visible, and the left sidebar contains various navigation links.

MEMBER

Letzte Besetzung	
Gesang,	John Lennon († 1980)
Rhythmusgitarre, Klavier	
Gesang, Gitarre, Bass, Klavier	Paul McCartney
Gesang, Leadgitarre, Star	George Harrison († 2001)
Schlagzeug, Percussion, Gesang	Ringo Starr (ab 1962)

OR BE FREE TO ASK ANYTHING ABOUT EVERYTHING



The screenshot shows the Wikidata Query Service interface. At the top, there are navigation links: "Beispiele", "Abfragengenerator", "Hilfe", and "Weitere Werkzeuge". The language is set to "Deutsch".

The query editor contains the following SPARQL query:

```
1 SELECT DISTINCT ?item ?itemLabel ?date WHERE {
2   SERVICE wikibase:label { bd:serviceParam wikibase:language "[AUTO_LANGUAGE]"; }
3   {
4     ?item p:P463 ?statement0.
5     ?statement0 (ps:P463/{wdt:P279*}) wd:Q1299.
6     ?item p:P569 ?statement_1.
7     ?statement_1 psv:P569 ?statementValue_1.
8     ?statementValue_1 wikibase:timeValue ?date.
9   }
10 }
11 ORDER BY ?date
```

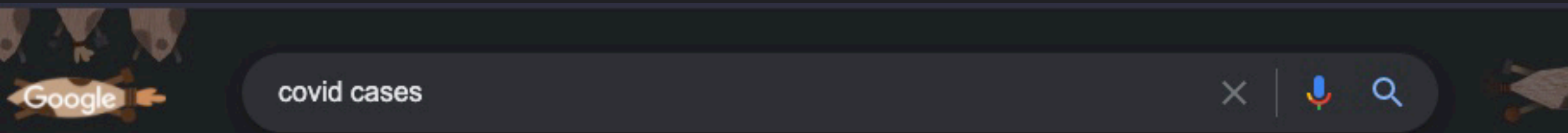
A notification in the top right corner indicates the time: "9:34:43 MESZ, 2. Sept. 2022" and "Daten aktualisiert vor ein paar Sekunden".

A red error banner at the bottom of the editor reads: "Die Abfrage ist fehlerhaft: Encountered " "order" "ORDER "" at line 15, column 1."

The bottom section shows the SPARQL query and the error message:

```
SPARQL-QUERY: queryStr=SELECT DISTINCT ?item ?itemLabel ?date WHERE {
SERVICE wikibase:label { bd:serviceParam wikibase:language "de". }
{
?item p:P463 ?statement0.
?statement0 (ps:P463/{wdt:P279*}) wd:Q1299.
?item p:P569 ?statement_1.
?statement_1 psv:P569 ?statementValue_1.
?statementValue_1 wikibase:timeValue ?date.
}
SERVICE <https://query.wikidata.org/sparql> {
?wditem wdt:P569 ?date .
OPTIONAL {?wditem wdt:P18 ?image . }
?wditem rdfs:label ?wditemLabel FILTER(LANG(?wditemLabel)="en").
}
ORDER BY ?date
java.util.concurrent.ExecutionException: org.openrdf.query.MalformedQueryException: Encountered " "order" "ORDER "" at line 15, column 1.
Was expecting one of:
 "(" ...
 "{" ...
 "]" ...
 "]" ...
 "." ...
 "<NIL>" ...
 "<ANON>" ...
 "optional" ...
 "graph" ...
 "minus" ...
 "filter" ...
 "true" ...
 "false" ...
 "bind" ...
 "construct"
```

HOW DO YOU SEARCH SINCE 2012?



Alle News Bilder Shopping Bücher Mehr Suchfilter

Ungefähr 4'710'000'000 Ergebnisse (0.77 Sekunden)

COVID-19 >

Coronavirus-Erkrankung (COVID-19) :

Überblick

News

Statistik

Symptome

Tests

▼

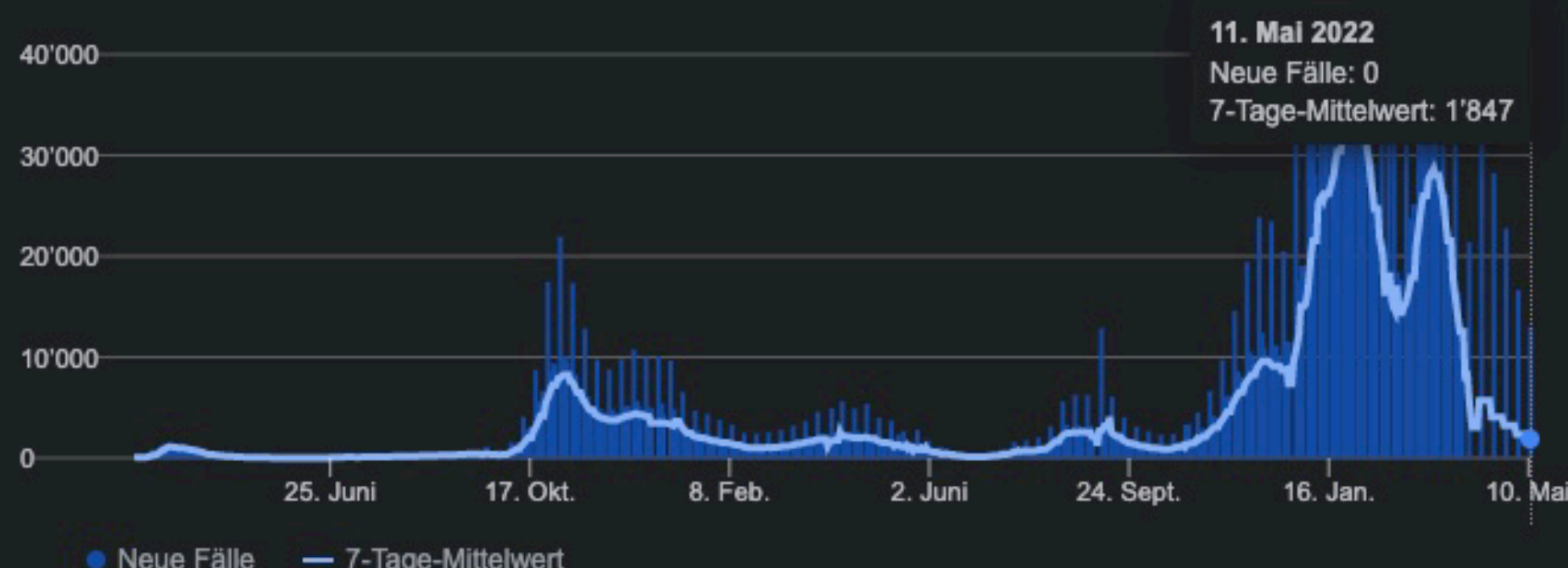
Tipp: Begrenze die Suche auf **deutschsprachige** Ergebnisse. Du kannst deine Suchsprache in den Einstellungen ändern.

Statistik

Neue Fälle und Todesfälle

Quelle: [JHU CSSE COVID-19 Data](#) · Zuletzt aktualisiert: vor 18 Stunden

Neue Fälle Schweiz Gesamt



COVID-19-Impfstoff
Aktuelles und lokale Informationen

Karte mit Fallzahlen (letzte 14 Tage)

Von [Wikipedia](#) und [anderen](#)



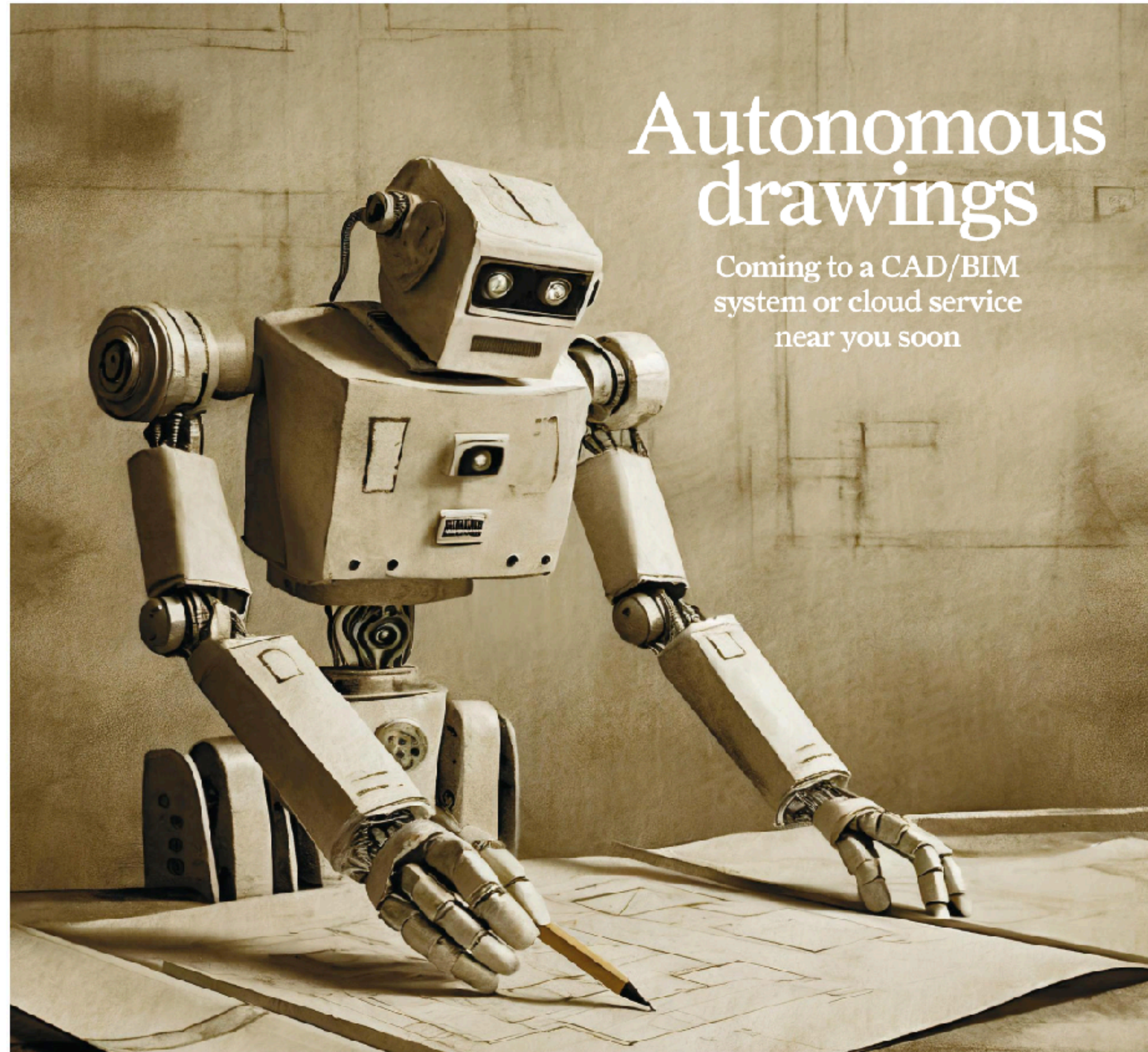
AI ASSISTANT

LLM2RAG

AECMAGAZINE

QAECY

Building Information Modelling (BIM) technology for Architecture, Engineering and Construction



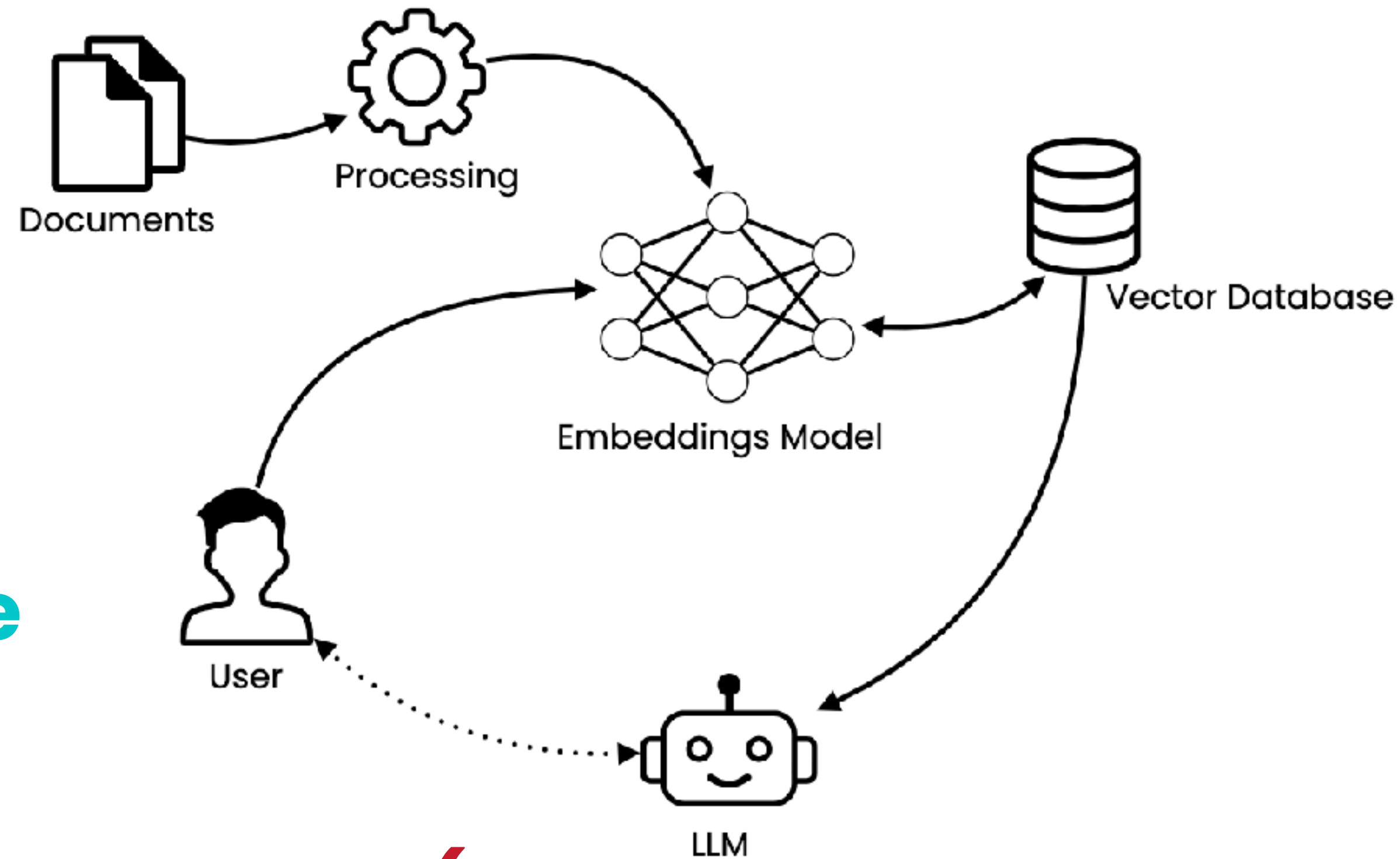
Autonomous drawings

Coming to a CAD/BIM system or cloud service near you soon

GENERATED WITH ADOLBE FIREFLY

RAG :-)

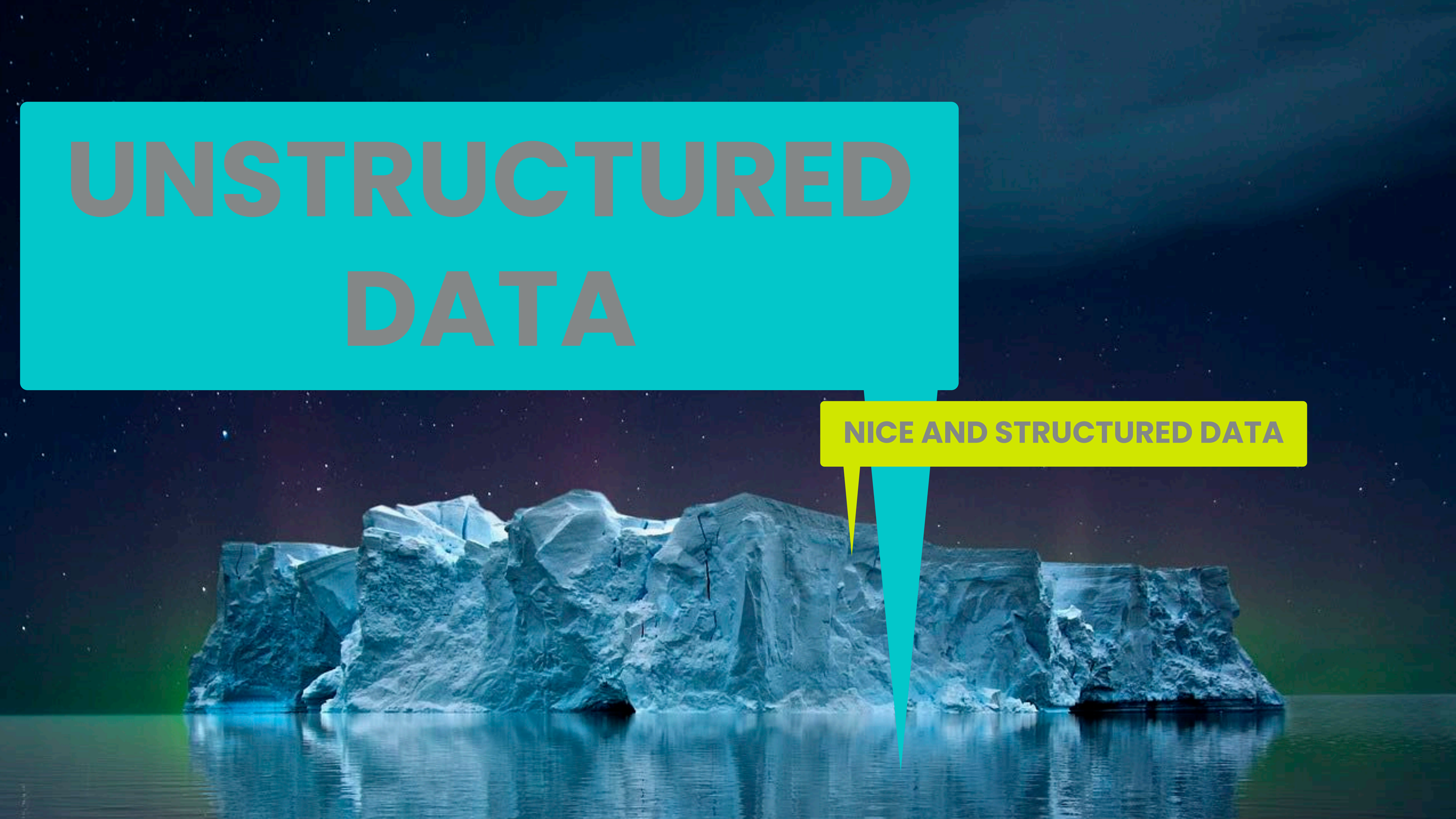
Kombination verschiedener Quellen :-)
verwendeten Quellen sind direkt zugänglich




Globale Sicht :-)
flexibler als
traditionelle Ansätze

Exakte Übereinstimmung :-)
hervorragend geeignet zur Beantwortung spezifischer Fragen

UNSTRUCTURED DATA

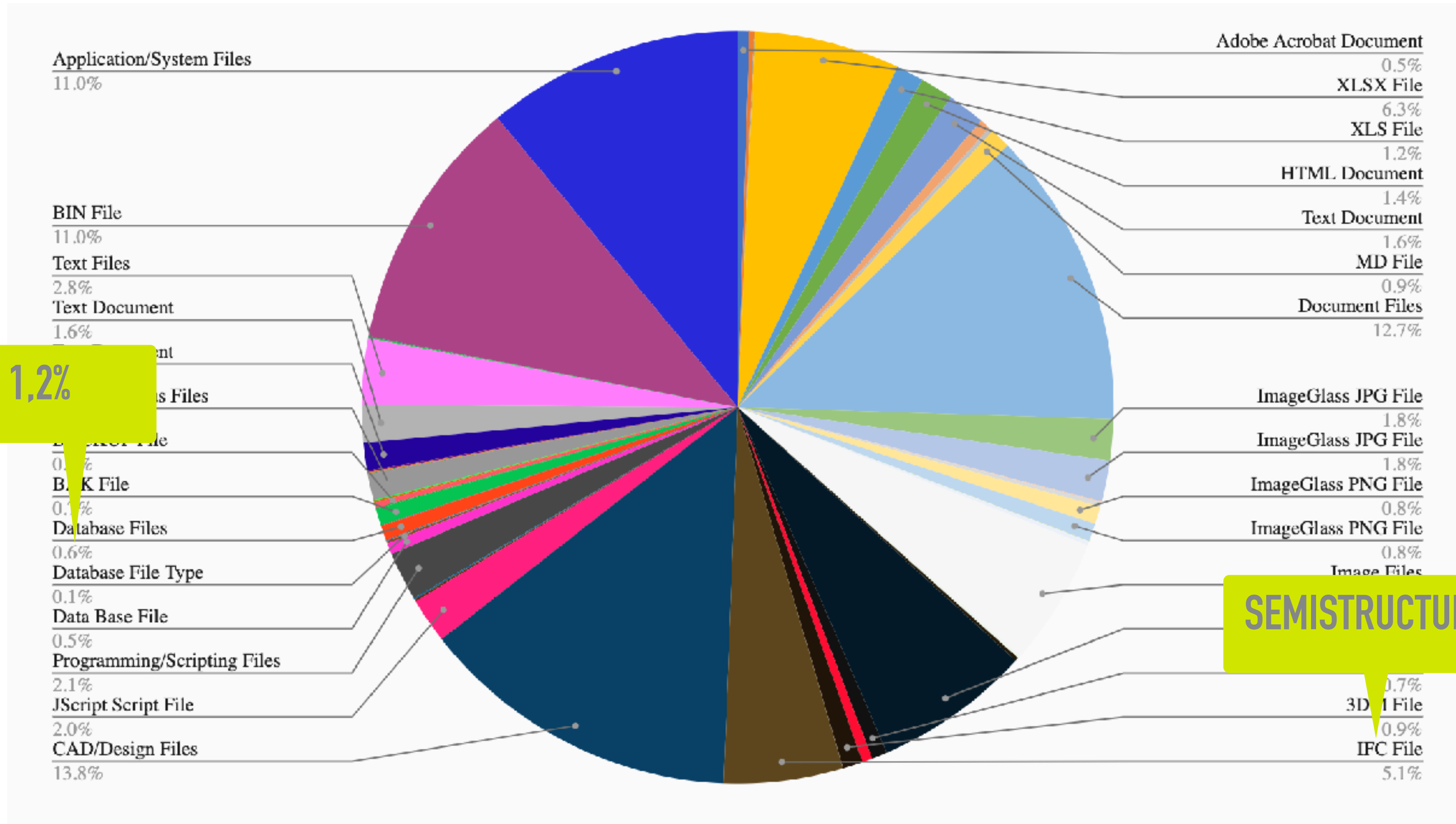
An iceberg floating in dark water under a starry night sky. The visible tip of the iceberg is small and labeled 'NICE AND STRUCTURED DATA'. The much larger, submerged part of the iceberg is labeled 'UNSTRUCTURED DATA'.

NICE AND STRUCTURED DATA

An aerial photograph showing a railway track on the left and a multi-lane highway on the right, both running through a lush green landscape with dense forests. A train is visible on the tracks. The sky is blue with scattered white clouds. Overlaid on the image is large, bold, white text.

1 Projekt
9500 Ordner
78000 Dateien
112 Formate

112 FILE TYPES



STRUCTURED = 1,2%

SEMISTRUCTURED IFC = 5,1%

Which file format steers your project?

**Say single source of truth
one more time!**



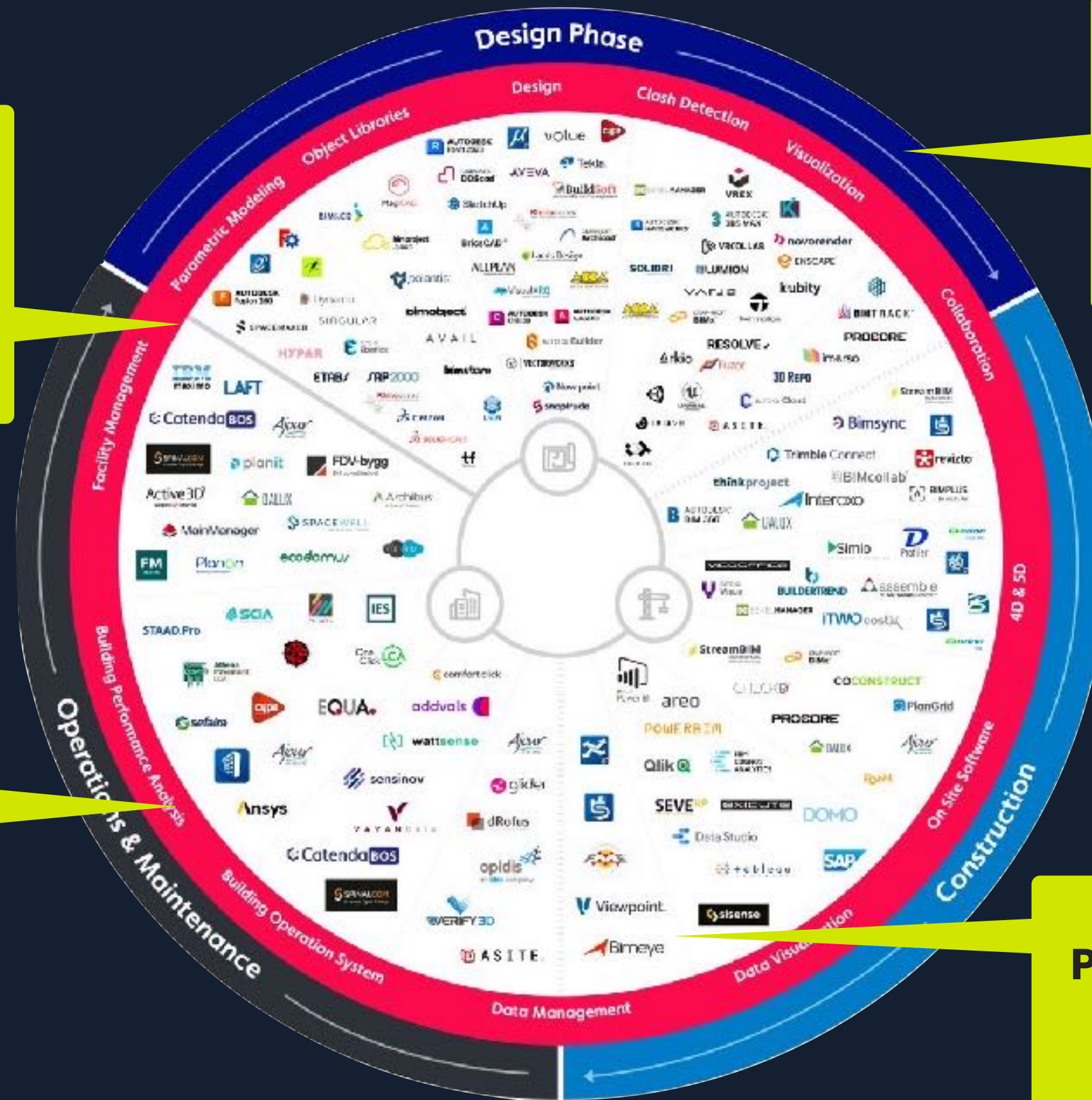
TODAYS INDUSTRY CHALLENGES

You have to know abbreviations and cryptic naming conventions

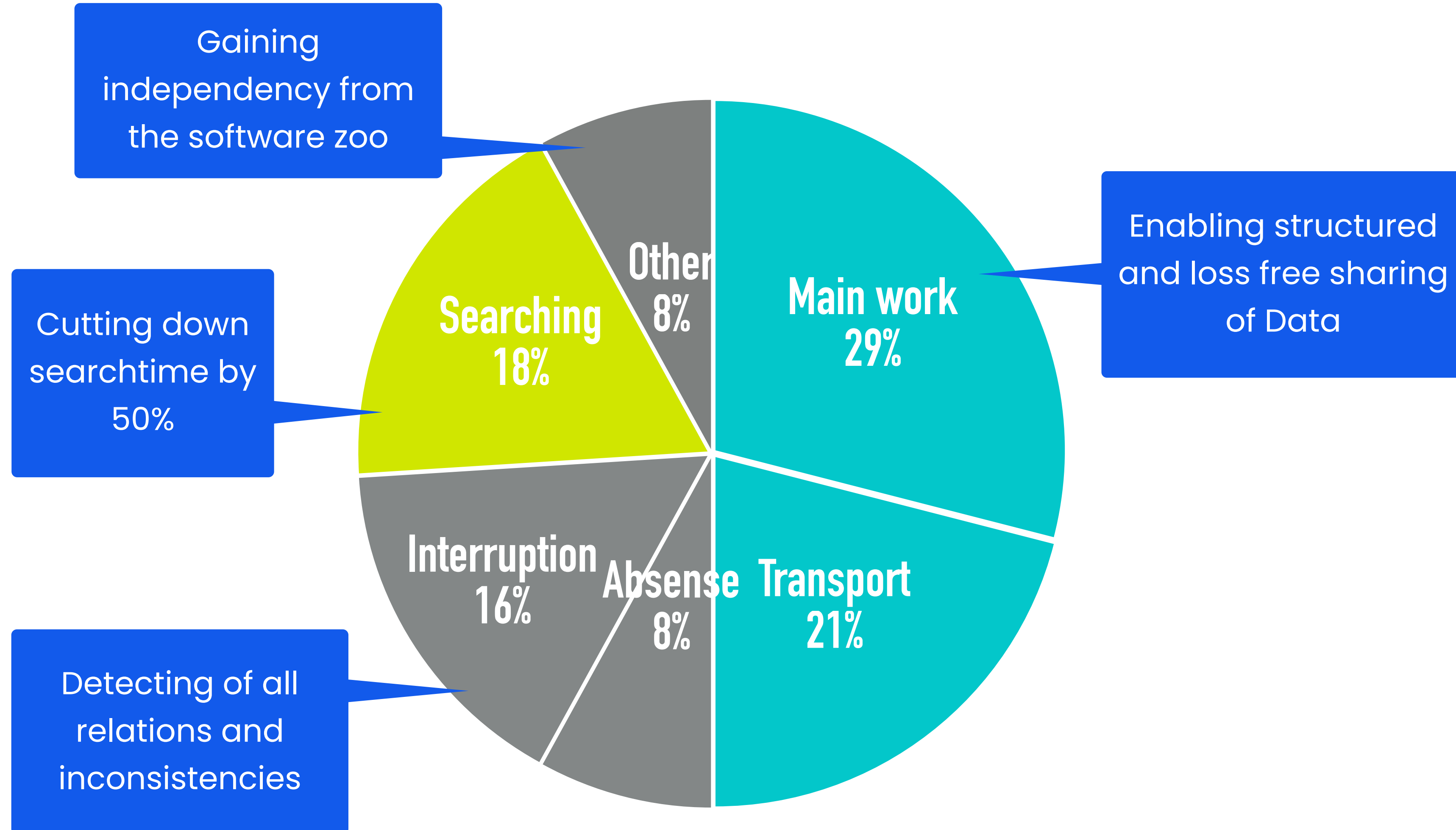
You cannot search higher level or multi-criteria

Thousands of different files (Models, Sheets, Documents)

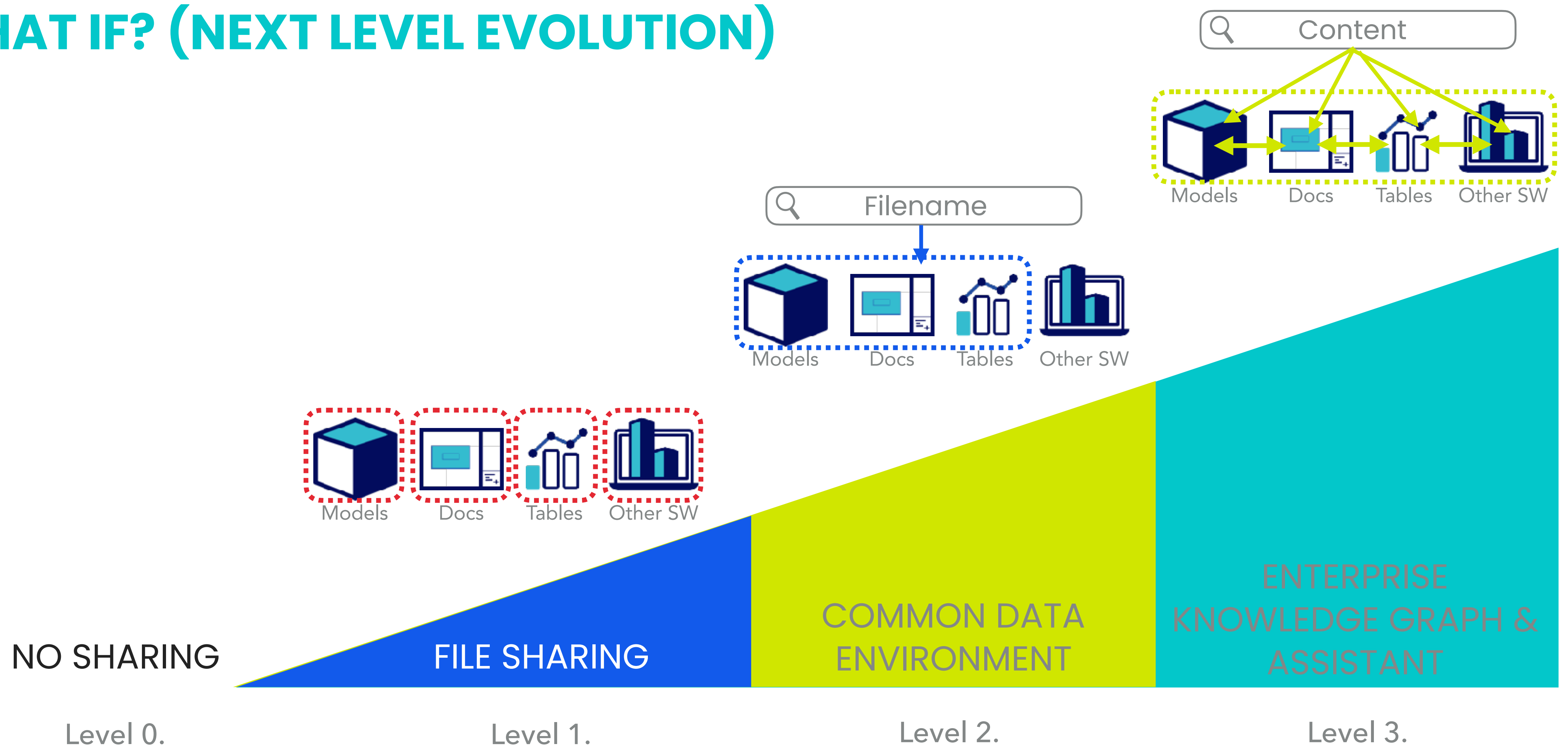
Proprietary software required to access content of each



RESULT OF SILOED INFORMATION



WHAT IF? (NEXT LEVEL EVOLUTION)





DXF-Extrakt Mapping Exportieren

GIS

GIS-Daten als RDF

CAD

Auswahl als GeoJSON

Auswahl als DXF herunterladen

Laden Sie die ausgewählten Entitäten aus der DXF-Datei als neue DXF-Datei herunter. Hinweis: Einige Geometriefunktionen werden noch nicht unterstützt und Blöcke werden aufgelöst.

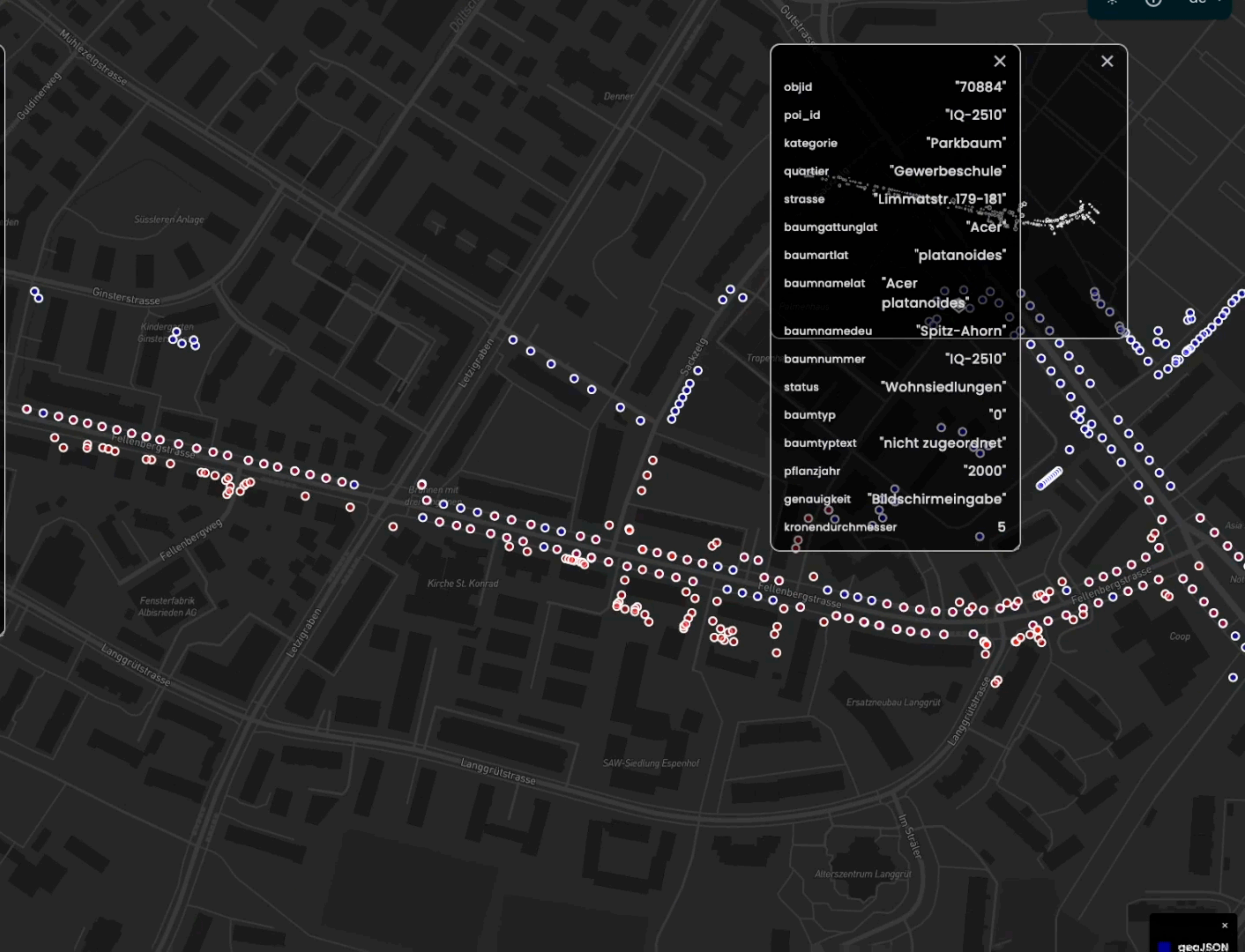
Mapping

Mappings herunterladen

Nicht zuordenbare herunterladen

Mappings herunterladen

Nicht zuordenbare herunterladen

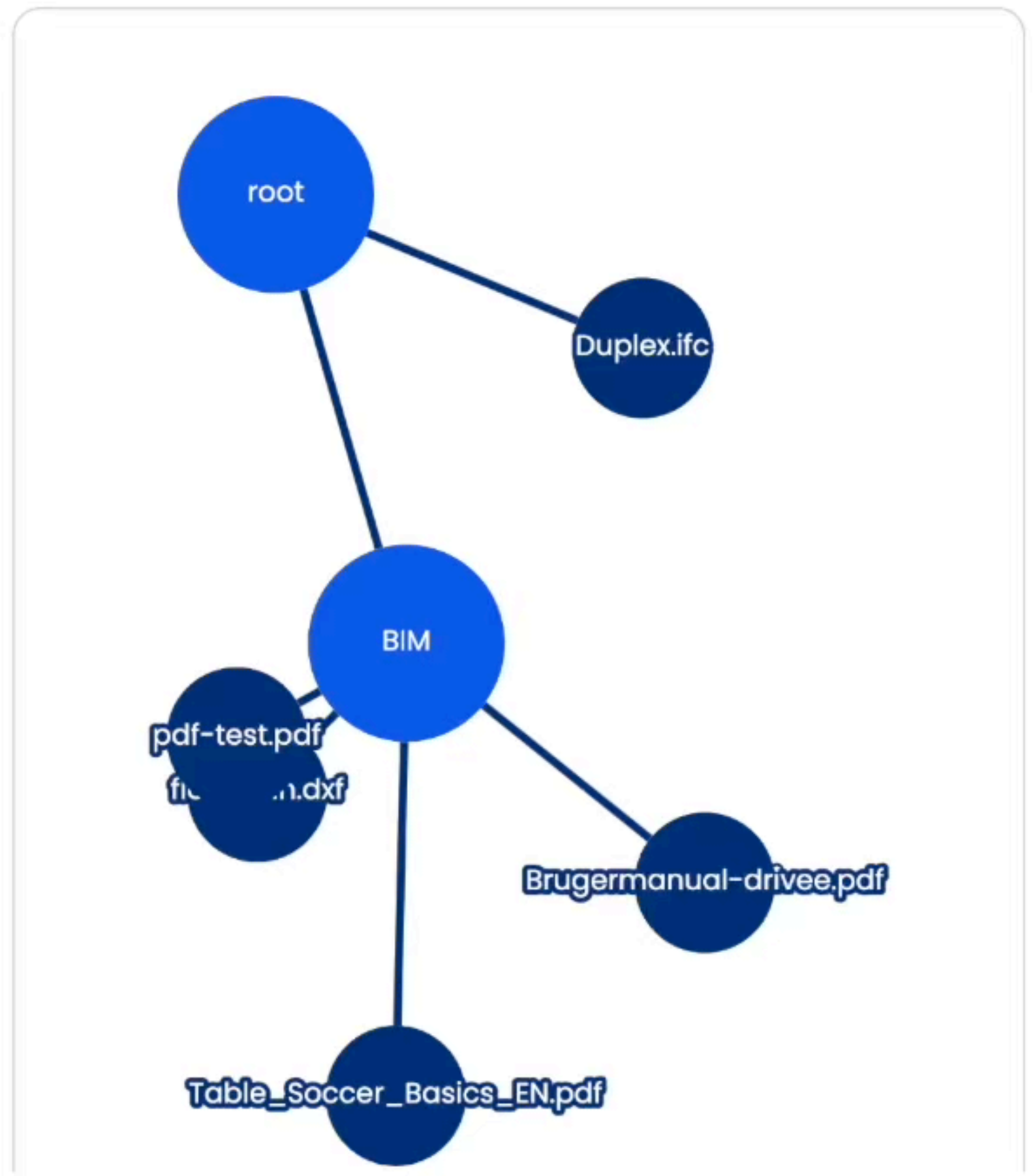
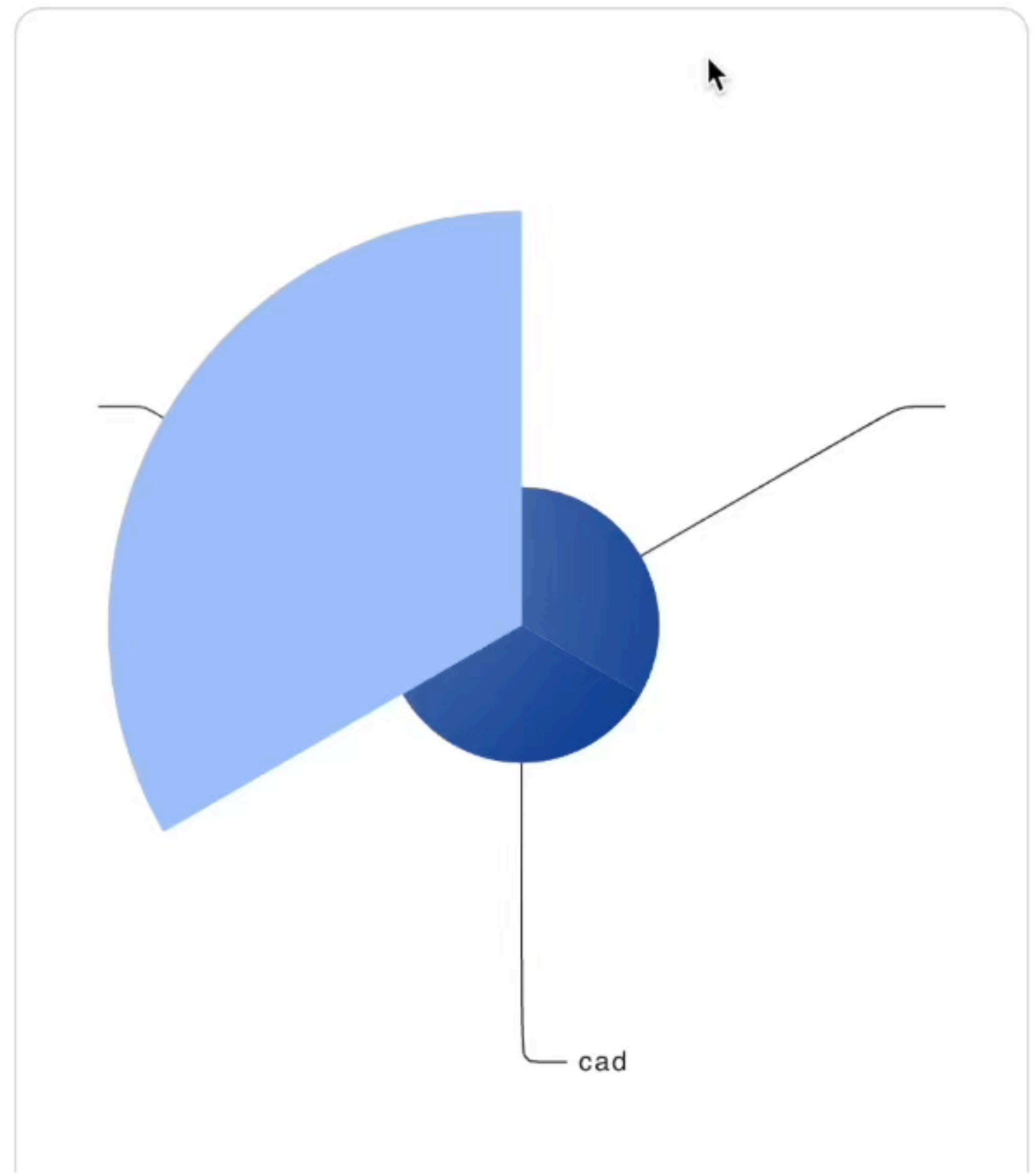


objid	"70884"
poi_id	"IQ-2510"
kategorie	"Parkbaum"
quartier	"Gewerbeschule"
strasse	"Limmatstr. 179-181"
baumgattunglat	"Acer"
baumartlat	"platanoides"
baumnamelat	"Acer platanoides"
baumnamedeu	"Spitz-Ahorn"
baumnummer	"IQ-2510"
status	"Wohnsiedlungen"
baumtyp	"0"
baumtypertext	"nicht zugeordnet"
pflanzjahr	"2000"
genauigkeit	"Bildschirmeingabe"
kronendurchmesser	5



stock | #579077A3

🔍 interior wall studs



Your knowledge, accessible





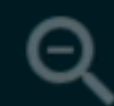
Die minimale Tragfähigkeit einer Kabellast beträgt 200 kg/lfm, wenn der Befestigungsabstand maximal 1500 mm beträgt.



Search...



26



Kabeltrassen, Formstücke und Zubehörmaterial sind in trockenen Räumen aus Stahlblech, sendzimirverzinkt auszuführen.

Kabeltrassen, Formstücke und Zubehörmaterial im Freien und in feuchten Räumen wie Kabelkellern und Energiekanälen, sind tauchfeuerverzinkt auszuführen.

Bei einem Befestigungsabstand von maximal 1500 mm wird die Tragfähigkeit einer Kabellast von 200 kg/lfm ohne Durchbiegung vorgeschrieben.

Für Neuinstallationen dürfen nur noch geschraubte Wand- und Stielausleger verwendet werden. (Klemmausleger können im Brandfall abrutschen)

Gitterkabelrinnen sind mit halogenfreier, umweltfreundlicher Kunststoffbeschichtung auszuführen. Bei speziellen Anforderungen sind sendzimirverzinkte oder tauchfeuerverzinkte einzusetzen

How to model the elevator's motion? Include formulas if necessary"

The elevator's motion can be modeled by the following equations.

Elevator position:

$$y = v * h / 10 * Ts$$

where:

- y is the elevator position at time h
- v is the elevator velocity
- h is the time interval
- Ts is the sampling interval

Elevator velocity:

$$v = u * 2$$

where:

- u is the chosen action (1 for up, -1 for down, 0 for stop)

Constraints:

- The elevator cannot choose the action 1 when it is on the top floor.
- The elevator cannot choose the action -1 when it is on the ground floor.
- The elevator cannot switch directions during a single sample. This means the 0 action must be taken between the 1 and -1 actions.

Additional notes:

- The elevator spends one sampling interval (2 seconds) from one floor to the next.
- This period is divided into 10 equal time intervals, denoted by the integer numbers h ($h = 1, 2, \dots, 10$) during which the elevator moves in small increments between two adjacent floors.
-

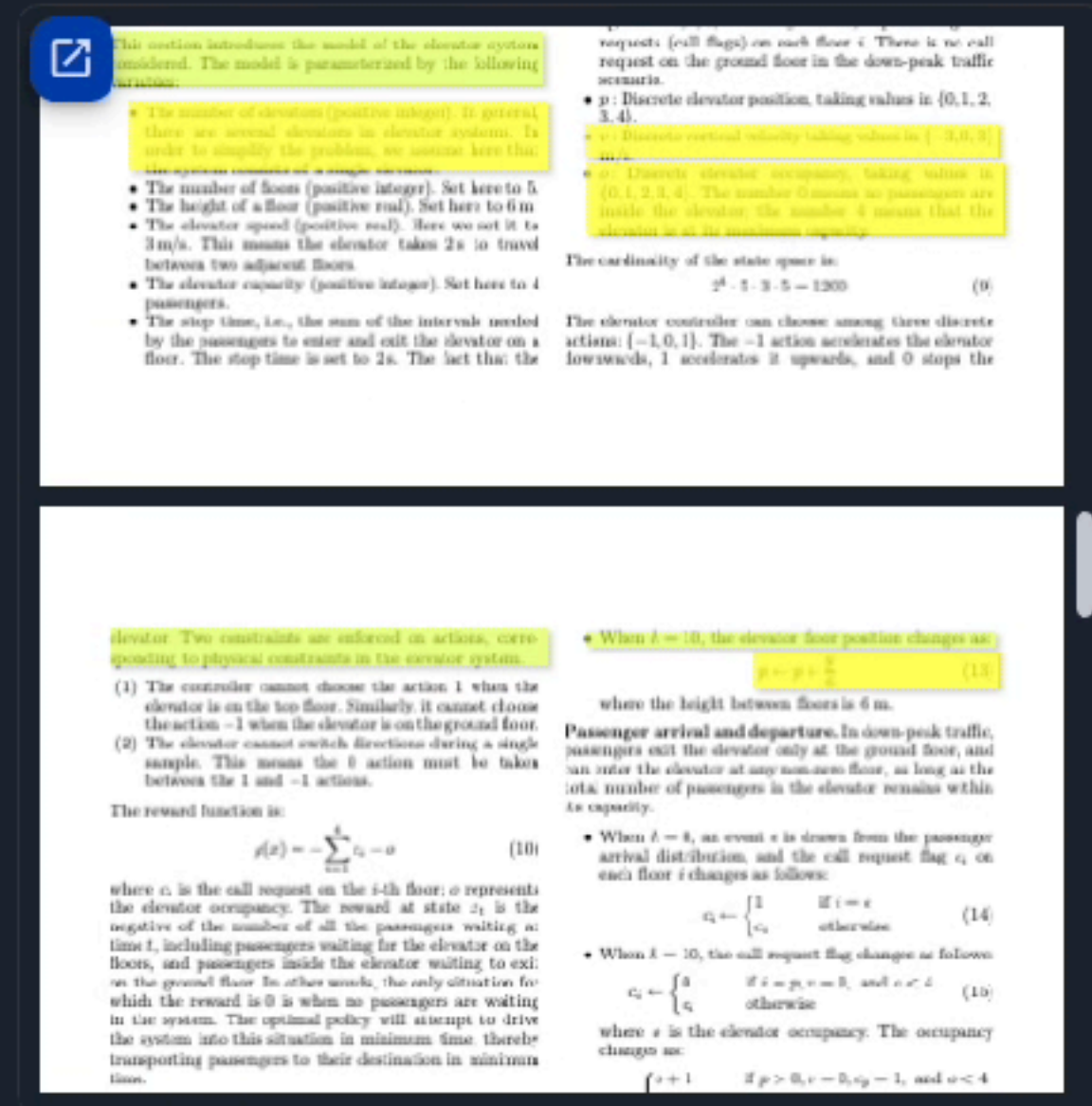
📄 Sources

Reinforcement Learning for Elev...

3 4 6 5

Elevator Group Control Using Mu...

3 10





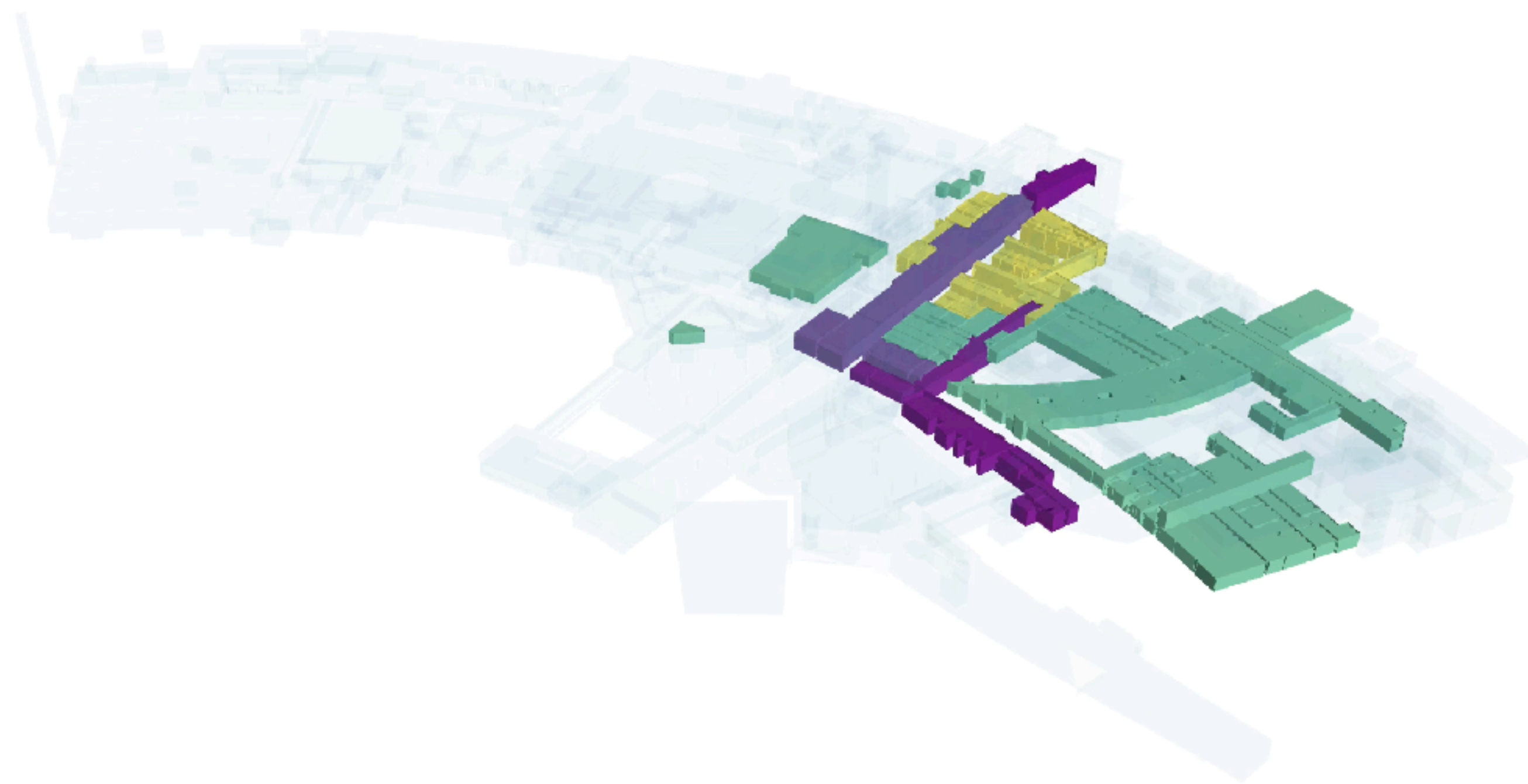
LOAD MODEL

SELECT

```

1 MATCH (s:bot_Space)-[hs:bot_hasSpace]-(z:bot_Zone)-[:dicp_
2 WHERE s.inst_globalId in ["1LJaBVf4qIJh7d_b1BBrci","2aSLXByr
3 MATCH (a)-[:dice_occupiesTimeInterval]-(t:dice_TimeInterval
4 WHERE dateTime(t.dice_hasStart)>=dateTime("2022-07-04T01:00:0
5 AND dateTime(t.dice_hasEnd)<=dateTime("2023-02-19T02:00:00.00
6 WITH s,z,a
7 UNWIND toInteger(s.inst_convexHullArea) as areas
8 WITH z.inst_name as zone_name, SUM(areas) as area_size, COLLE
9 CALL apoc.create.vNode(['VZone'], {name:zone_name, areaSize:area_size})
10 RETURN vnodes

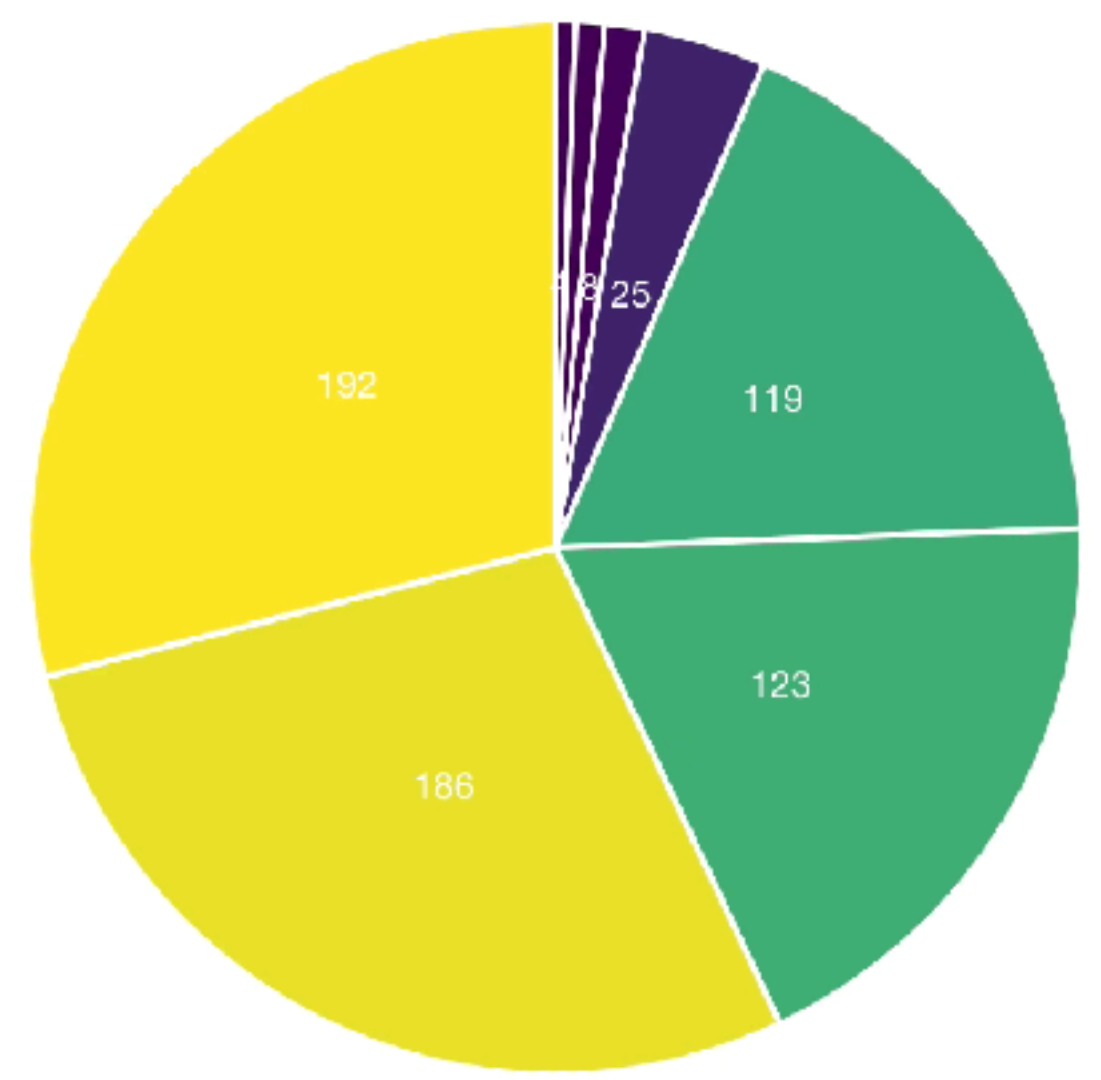
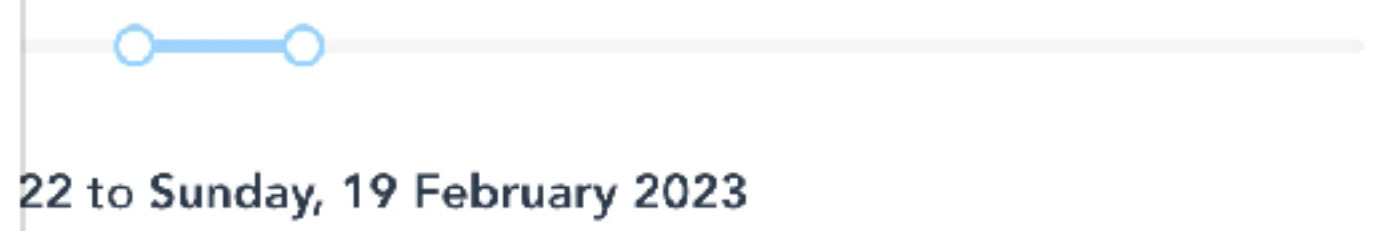
```



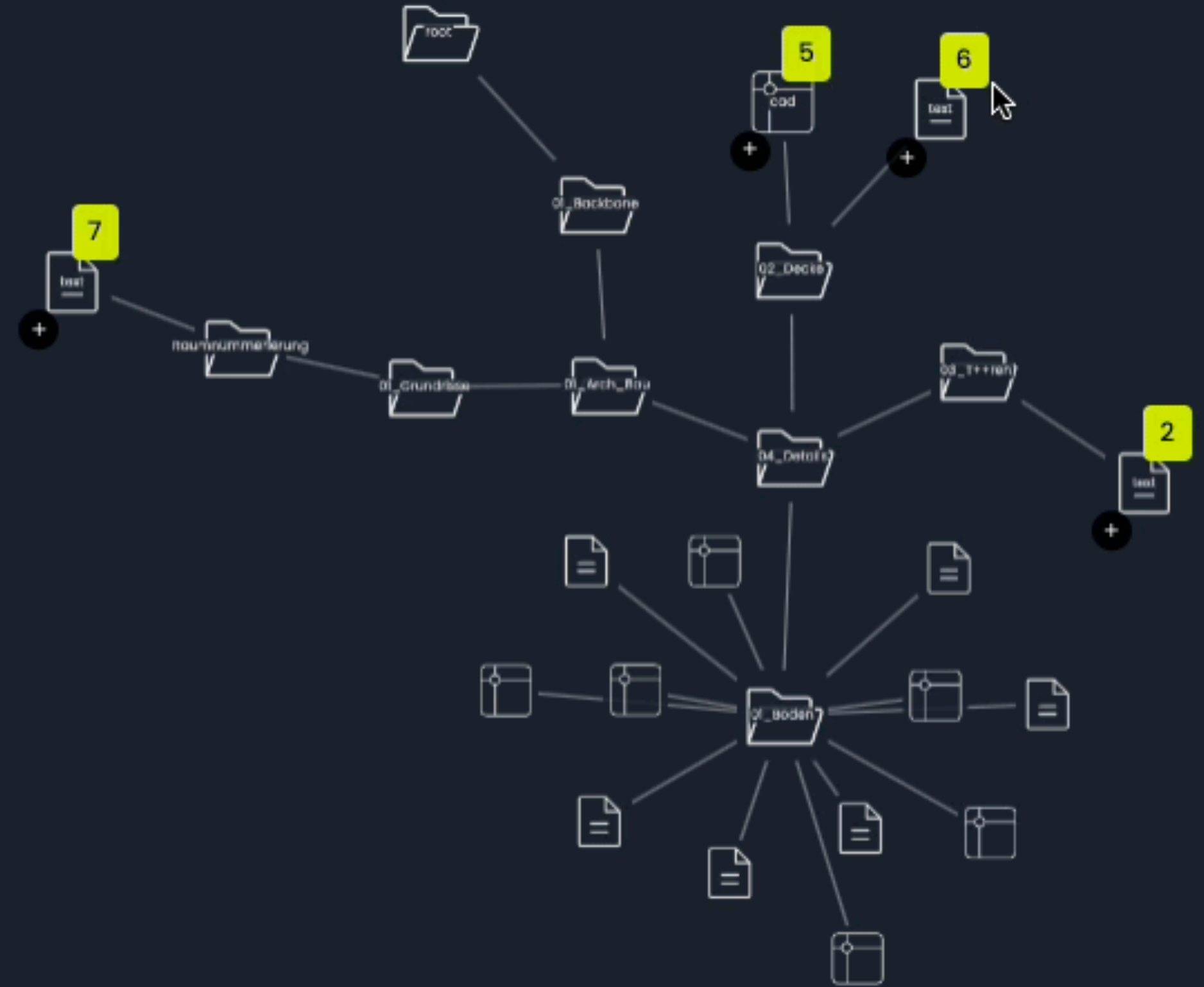
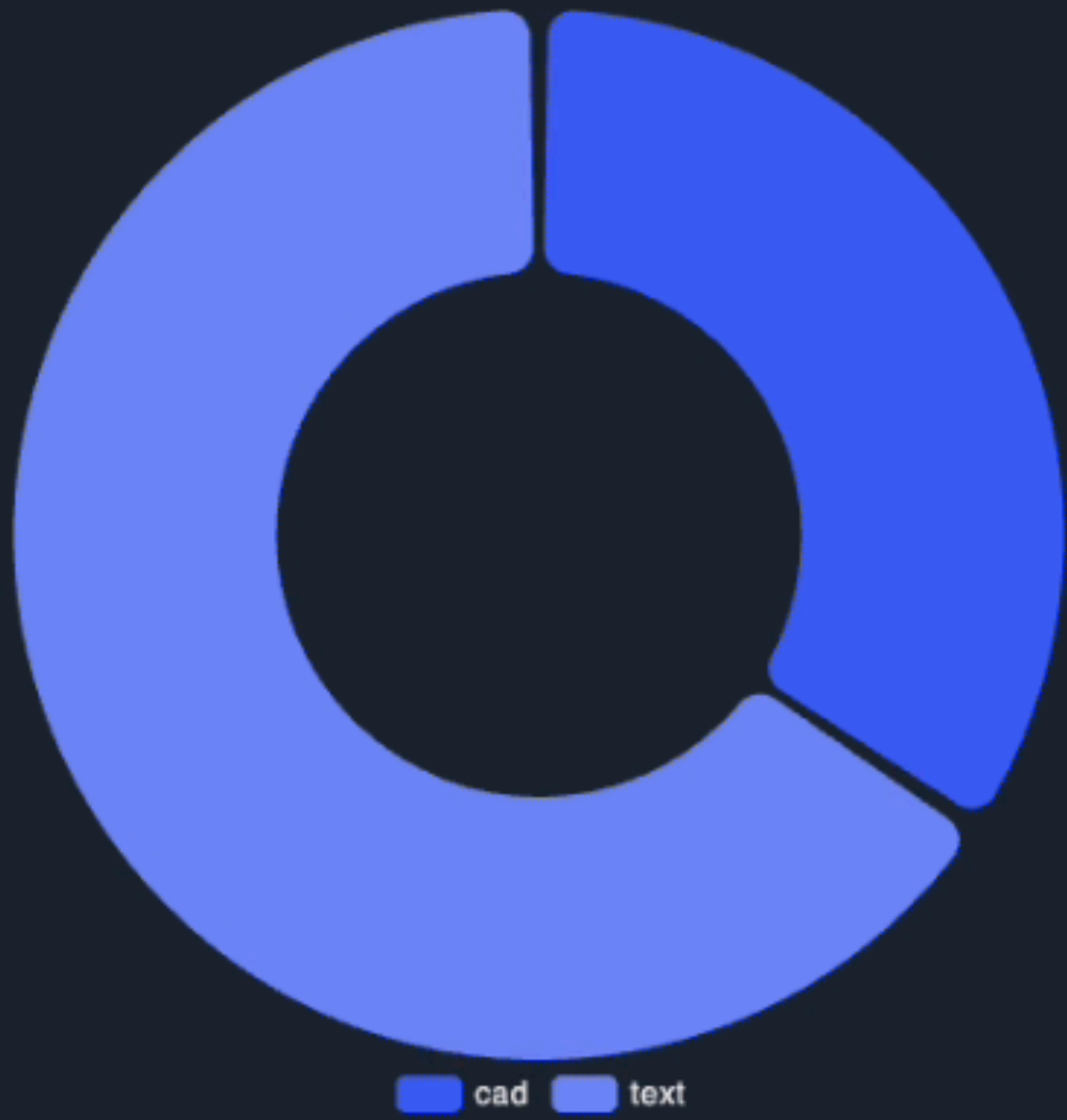
ANALYSE

- Zone Areas
- Zone Tasks
- Space Connectivity

RUN RESET



Search



L-CDE

QAECY



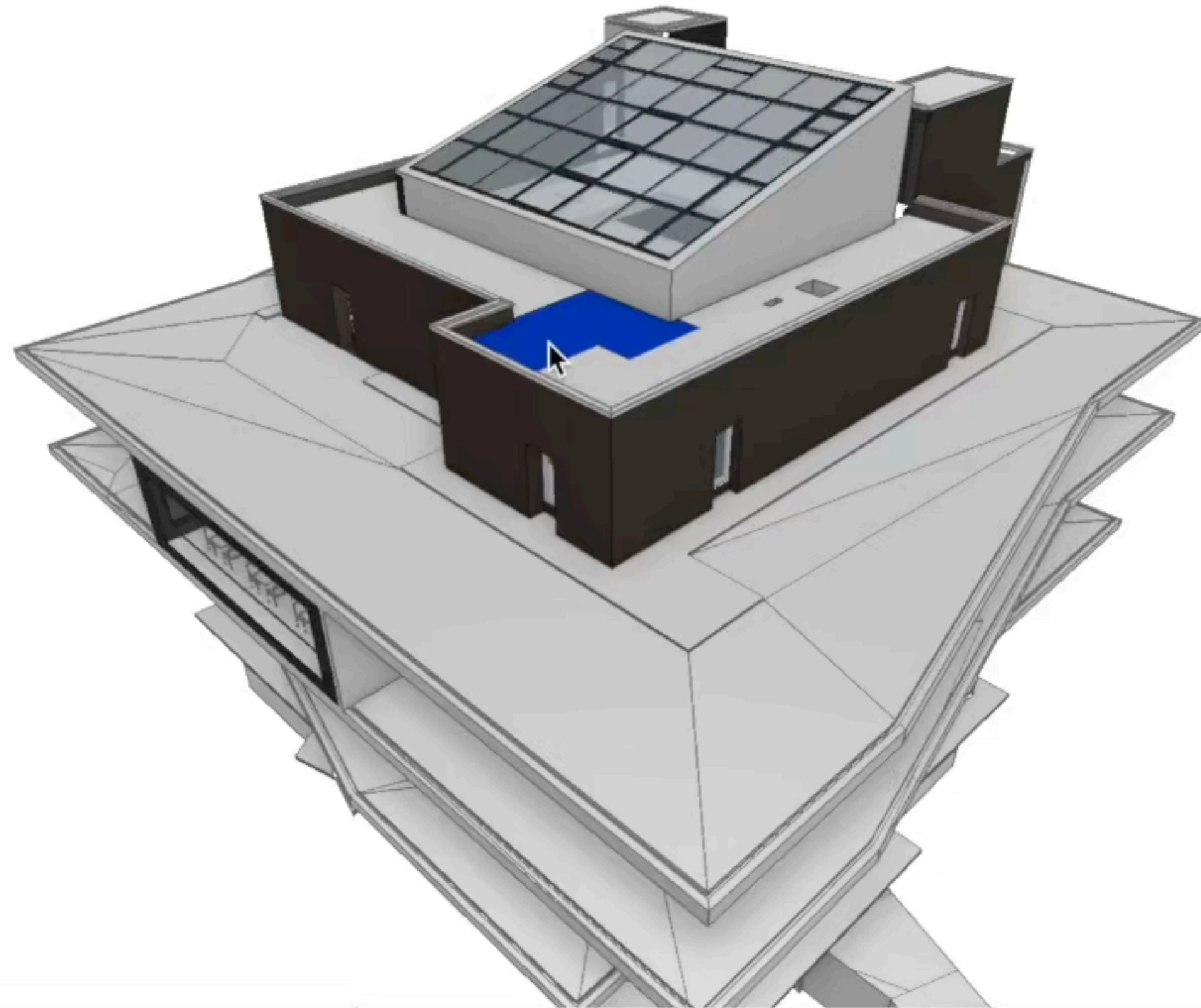
Resource

Project models

Duplex.ifc



220425_BACKBONE.ifc



⌘ Show grid

📐 Fit model

+ Add

🗑 Clear

📏 Length

📦 Area

📐 Angle

🗑 Clear

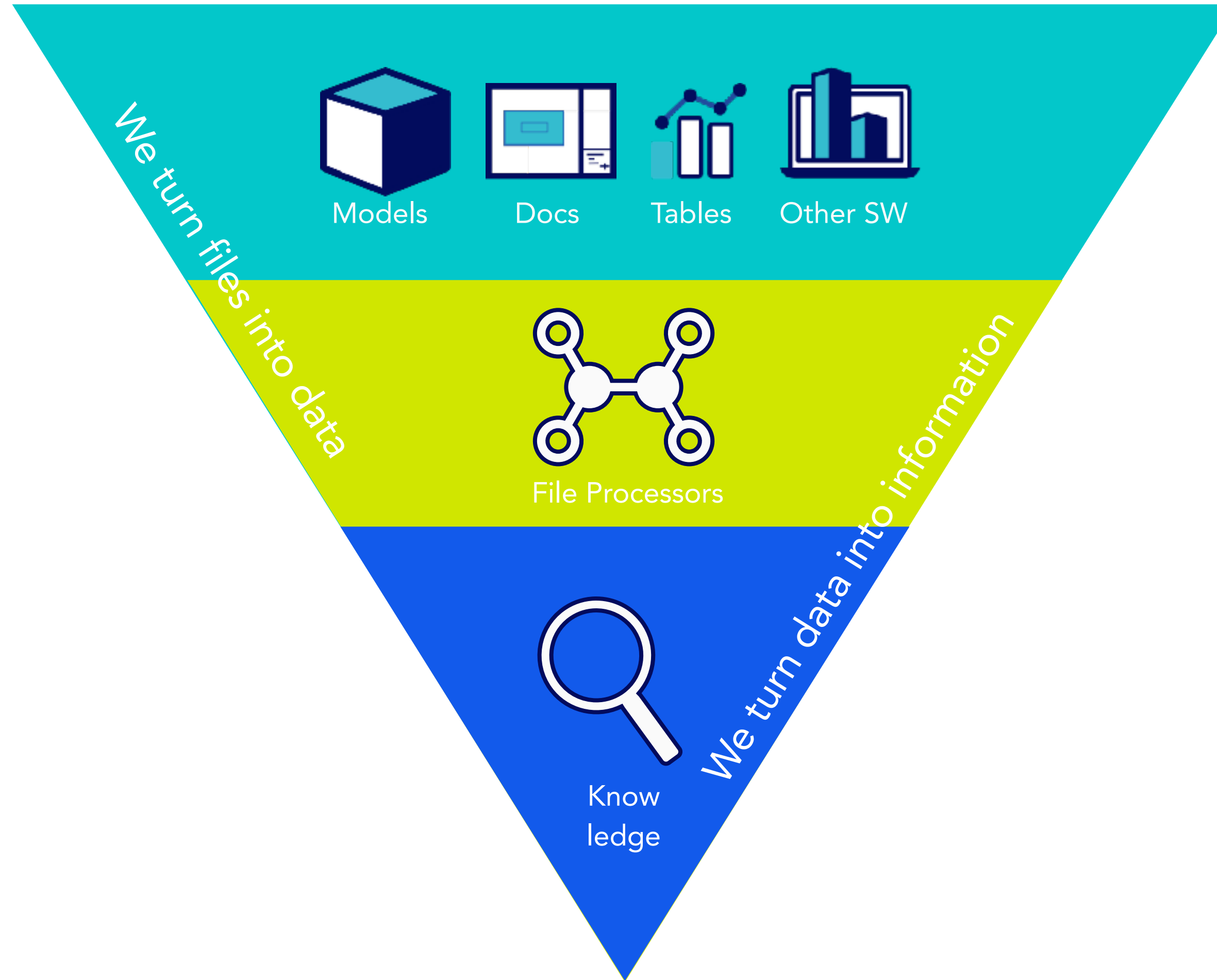
👁 Visibility

✂ Sections

📏 Measure



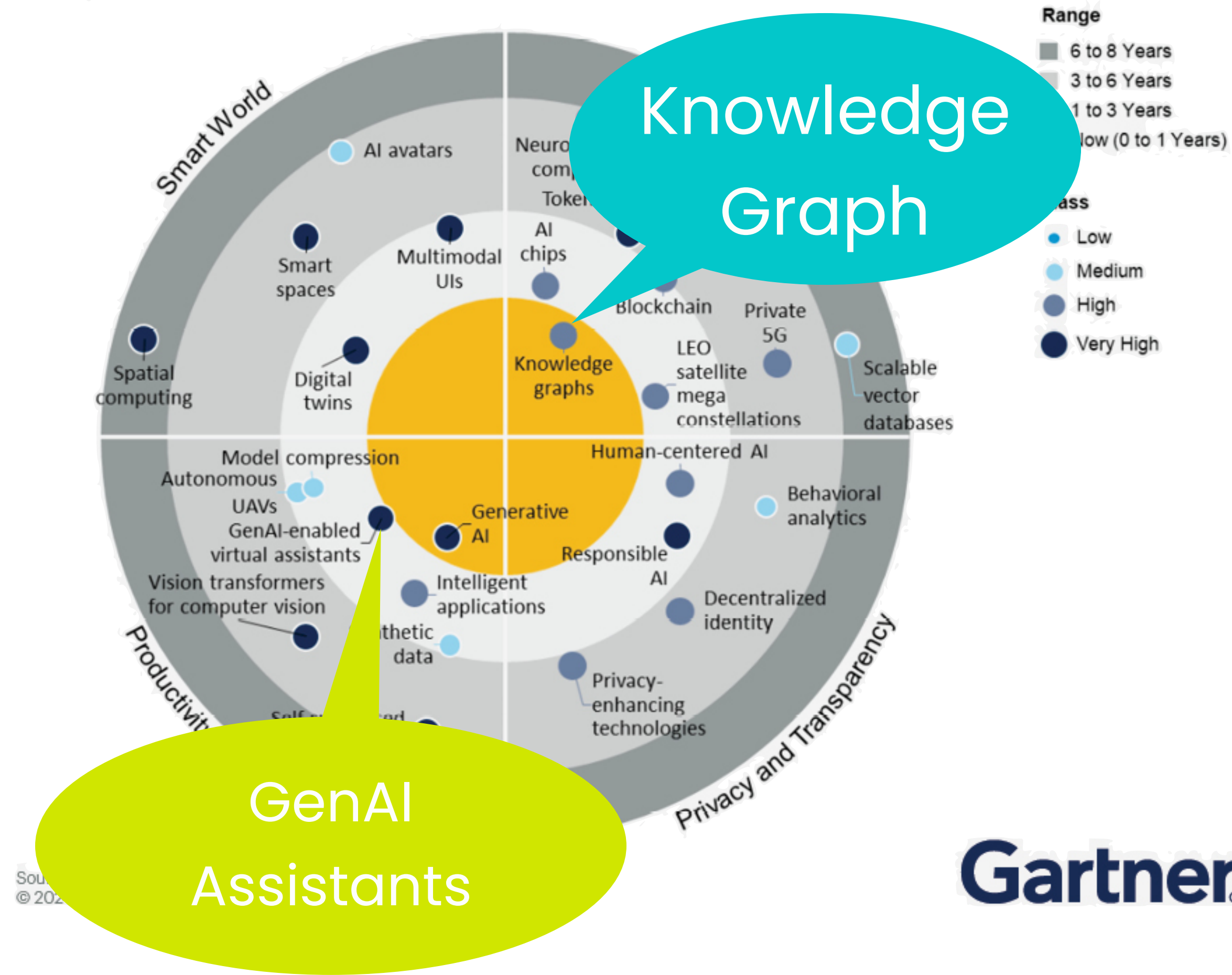
AEC KNOWLEDGE ASSISTANT



 **SEARCH OR ASK ANYTHING...**

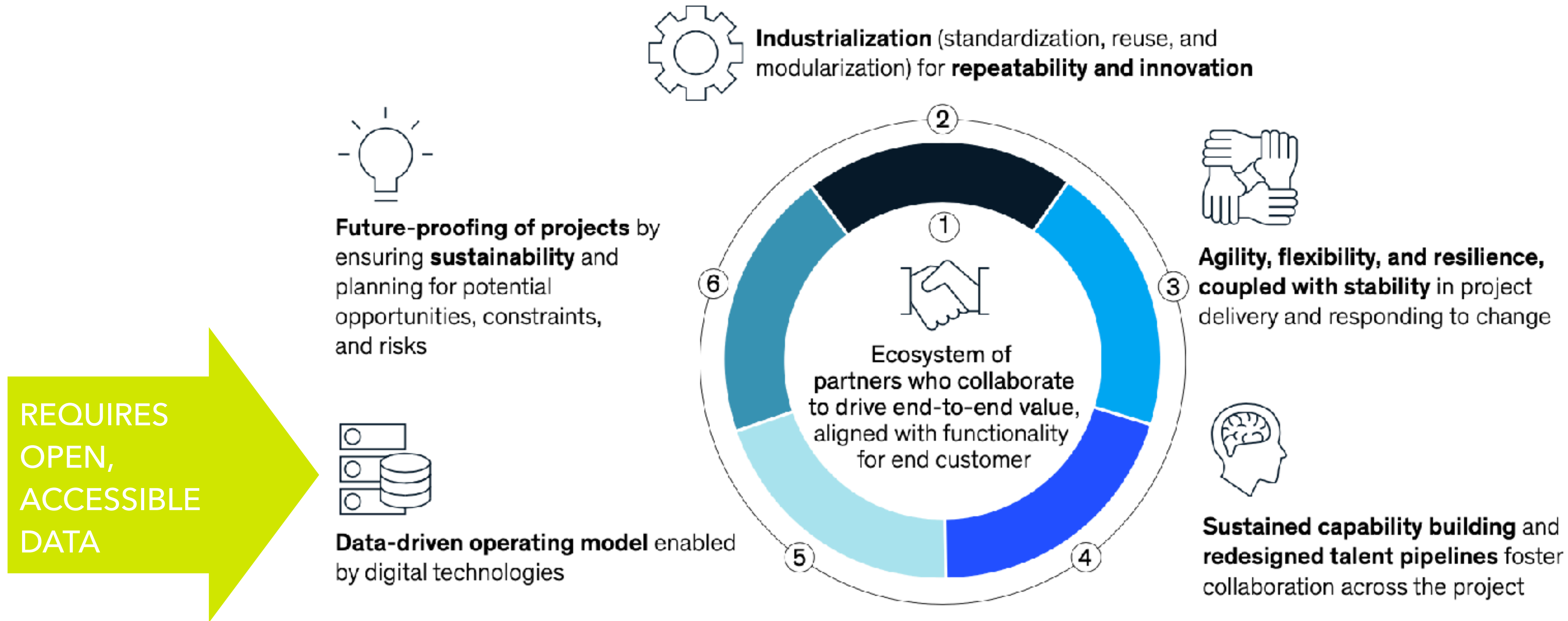
IMPACT 24

Impact Radar for 2024



Gartner

NO DATA, NO DATA DRIVEN MODEL



Shift in mind-sets to adopt disruptive ideas and ways of working to **unleash value from Projects 5.0**



**TURNING
UNSTRUCTURED
FILES INTO
USABLE DATA**

NO DATA, NO AI