

Analysis and Visualization of SAP Custom Code and its Relationships to the SAP System

VISAP the **VI**tual **SAP** **A**alytics Process

A cooperation between GISA GmbH and
Research Group Visual Software Analytics, Leipzig University

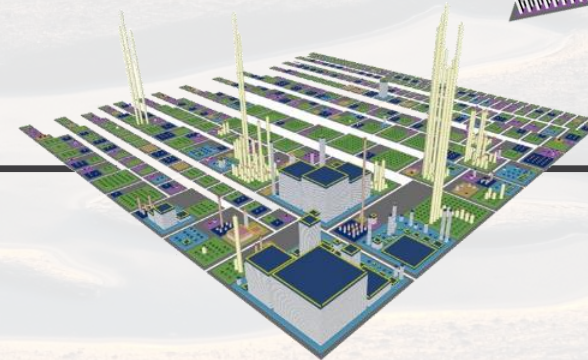
Pascal Kovacs

13.11.2020



UNIVERSITÄT
LEIPZIG

member of itelligence group



gisa[®]
That's IT.



- Since 2010 Development Consultant at Gisa GmbH 3 days a week
- Since 2019 in full time 5 days a week
- SAP-ISU Billing
- Project Manager Custom Code Lifecycle Management

■ *Managing the cooperation-project VISAP* ■

■ *Recruiting and supporting of new trainees and employees* ■

2011 – 2019 Researcher at Leipzig University 2 days a week ■

PhD-Thesis „Interaction with 3D Software Visualization“ ■

Lecture „Developing of distributed Applications“ ■

Supervising of Bachelor- and Master-Thesis ■

Over 25 years of experience

GISA is...

Full IT service provider and specialist for the energy industry and public sector clients

Turnover 2019

€ 104 million (IFRS)

Employees 2019

830

Foundation

1993

Locations & offices

headquarter: Halle (Saale) | Berlin, Leipzig, Chemnitz, Cottbus, use of the nationwide itelligence locations

Certification

BSI-certified high-performance data center
multi-certified SAP and Microsoft Partner



Qualified partner of energy industry

Many years of experience and professional IT support of all market-controlled

Solution portfolio

- Billing- and device management
- Smart meter gateway administration & EMT-Integration
- Facility and geodata management
- Sales and customer management
- Portals und Mobile IT
- Human resource management
- Enterprise Resource Planning
- Enterprise Information Management
- IT security und IT compliance
- Solution for Remunicipalisation

Market topics of the future

- Digital management consulting
- Augmented Reality (Visualization)
- Internet of Things
- Hybride Cloud Solutions
- Predictive Maintenance
- Predictive Analytics
- Big Data
- Blockchain
- eMobility



Qualified Partner for Public Sector

Many years of experience and professional IT support

Solution portfolio

- Enterprise Resource Planning
- Human resource management
- Enterprise Information Management
- IT security und IT compliance
- New municipal financial management
- SAP Public Sector Management
- Electronic files und IT-based transaction processing
- Facility and geodata management
- Portals und Mobile IT

Market topics of the future

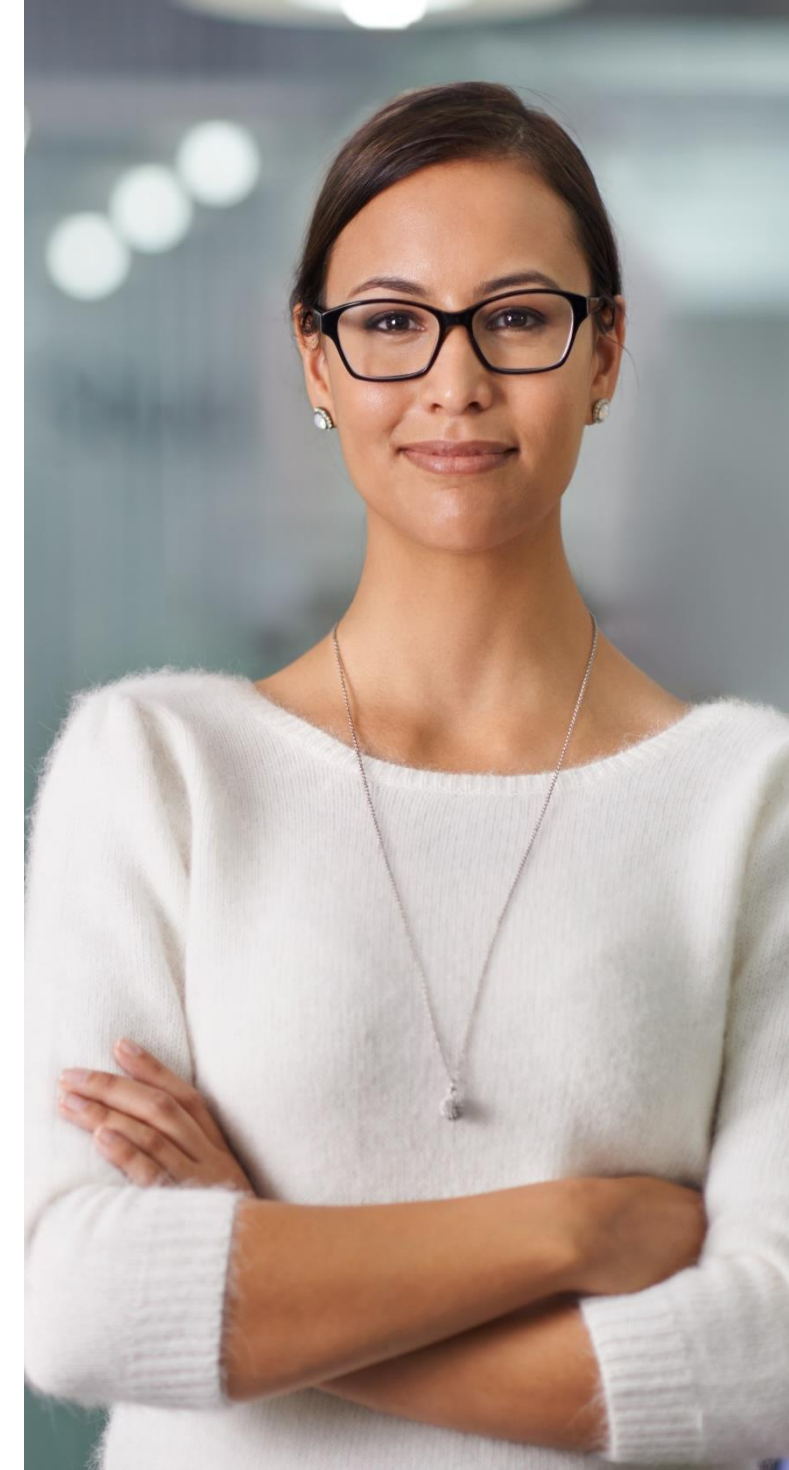
- Internet of Things
- Augmented Reality (Visualisierung)
- Hybride Cloud-Lösungen
- Predictive Maintenance
- Predictive Analytics
- Big Data
- Blockchain
- eMobility



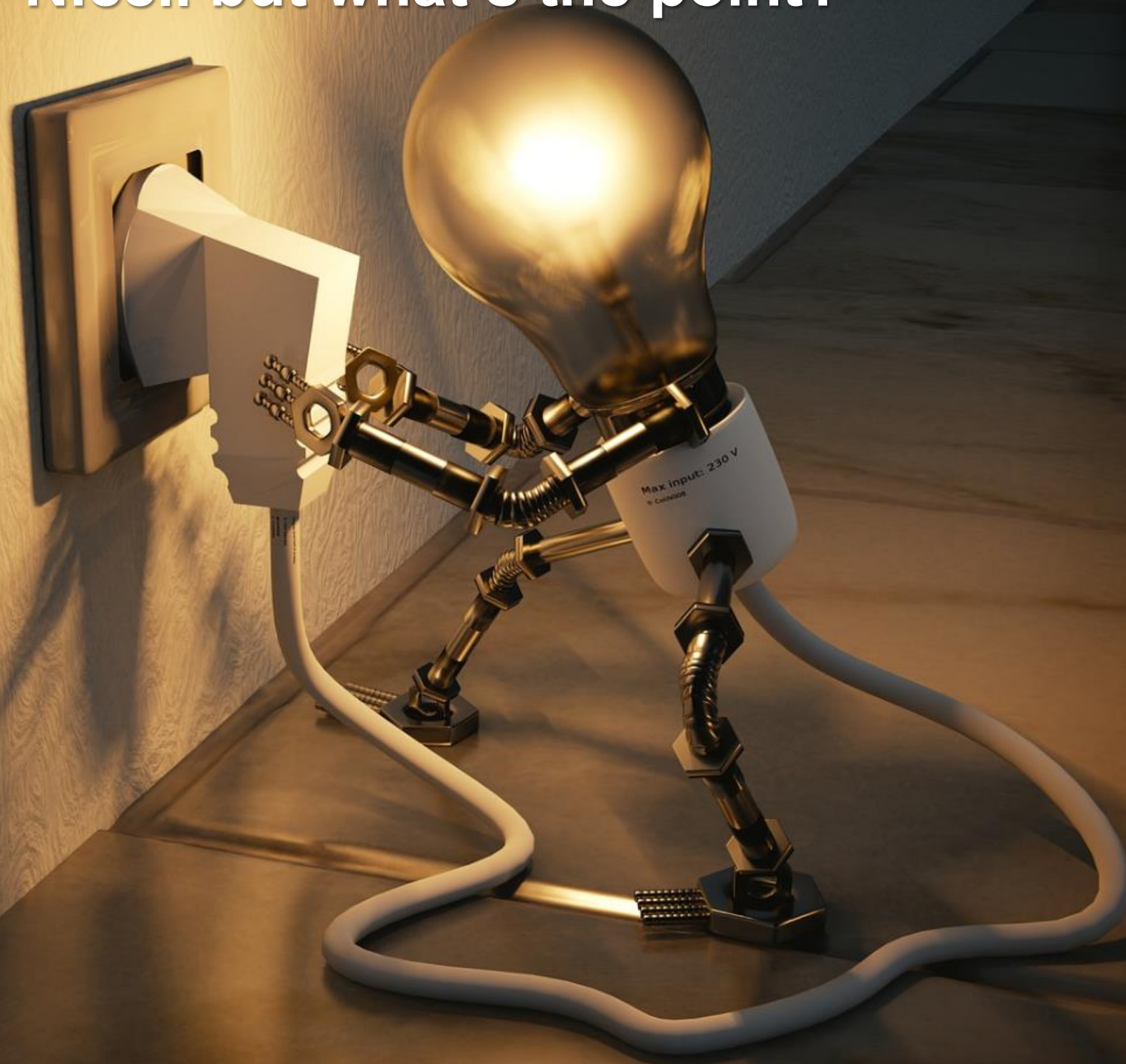
Perspectives for personalities

Individual Career Planning

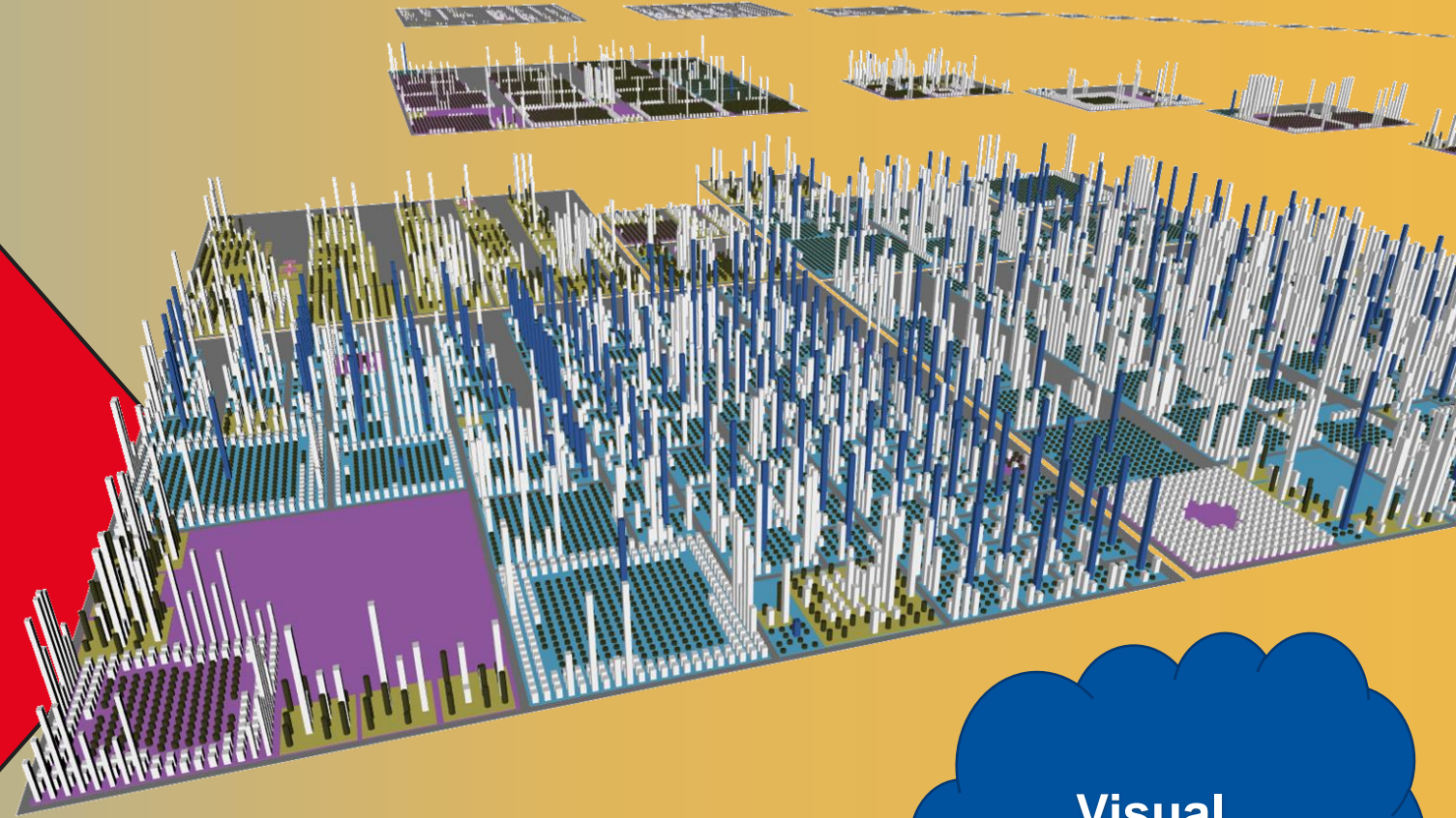
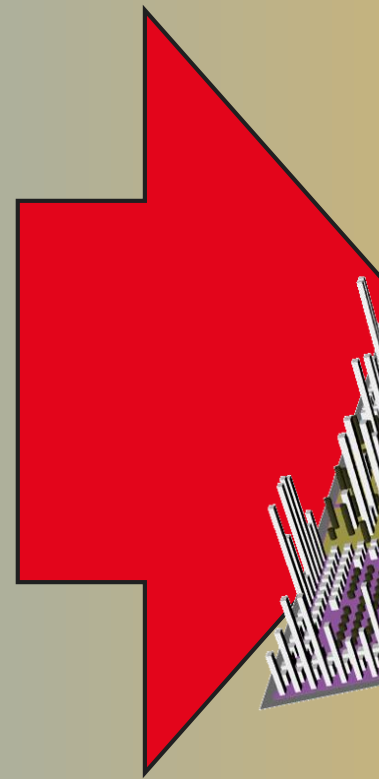
- Dual study programmes in cooperation with selected universities
 - Entry young professionals
 - Internships and work-study activities
 - Supervision of theses
 - Training and qualification programs
-
- Performance-based pay
 - Flexible working hour models
 - Above-average employee benefits



Nice.. but what's the point?



Software Visualization in a Nutshell



Visual
Analytics

Software Visualization in a Nutshell

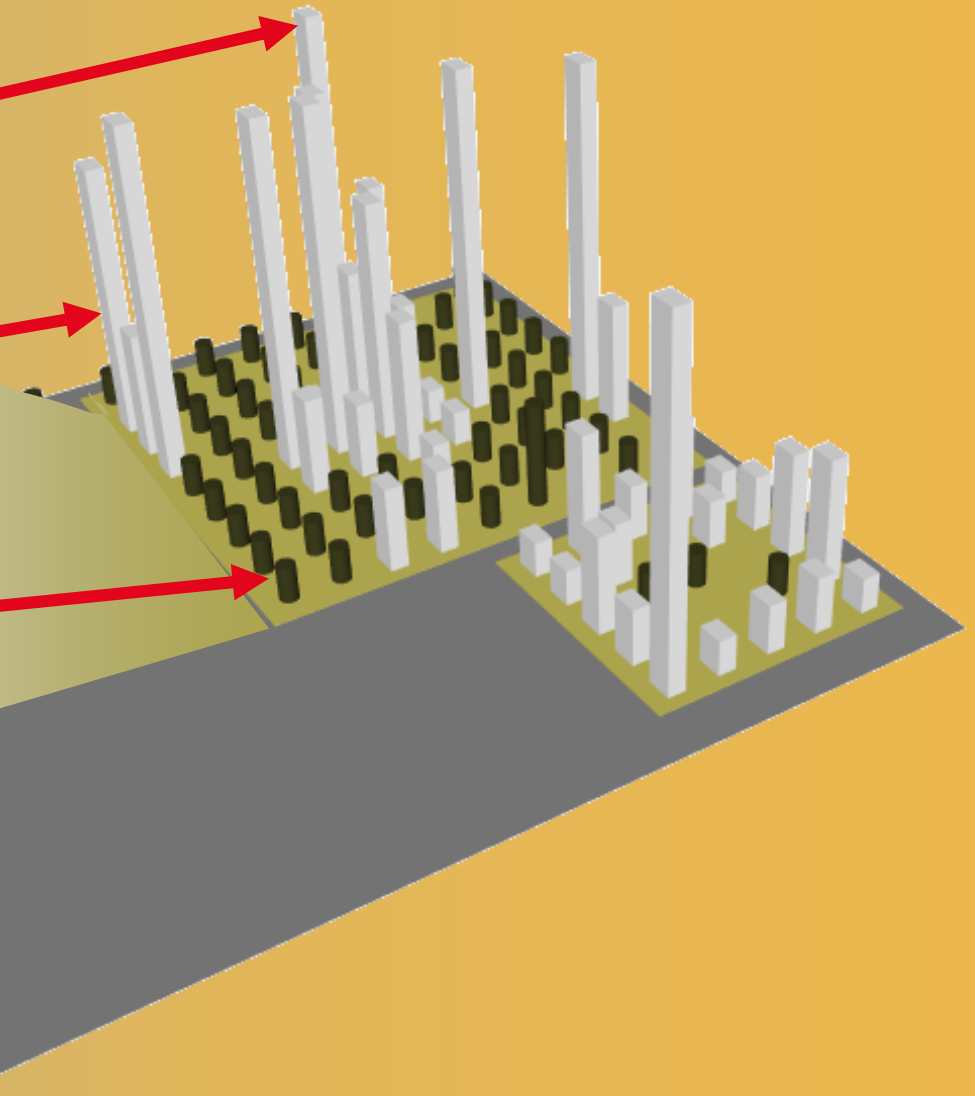
Class

```
17 FINAL
18 CREATE PUBLIC .
19
20 PUBLIC SECTION.
21 DATA:
22     "!" <p class="shorttext synchronized">Instanz-Tabelle.</p>
23     mt_instances TYPE mttty_instances.
24
25 CLASS-METHODS:
26     "!" <p class="shorttext synchronized">Holt Laufzeit, die für eine Inspektion gesetzt wurde.</p>
27     "!"
28     "!" <p class="shorttext synchronized">Inspektionsschlüssel.</p>
29     "!" <p class="shorttext synchronized">Laufzeit für diese Inspektion.</p>
30
31     RETURNING
32     VALUE(ro_runtime) TYPE REF TO /gisa/cl_cclmc_runtime_env,
33
34     "!" <p class="shorttext synchronized">Erstellt neue Laufzeit für ein gegebenes Remotesystems.</p>
35
36     "!" <p class="shorttext synchronized">Systemschlüssel des Remotesystems.</p>
37     "!" <p class="shorttext synchronized">Alternatives Log-Objekt.</p>
38     "!" <p class="shorttext synchronized">Alternatives Log-Sub-Objekt.</p>
39     "!" <p class="shorttext synchronized">Neue Laufzeit.</p>
40
41     @parameter iv_runtime
42     create_new_runtime_for_system
43     IMPORTING
44         is_system          TYPE /gisa/cclmb_s_sys_key
45         iv_log_object       TYPE balobj_d OPTIONAL
46         iv_log_sub_object   TYPE balsubobj OPTIONAL
47
48     RETURNING
49     VALUE(ro_runtime) TYPE REF TO /gisa/cl_cclmc_runtime_env
50
51 METHODS:
52     "!" <p class="shorttext synchronized">Setzt aktuelle Instanz als Laufzeit für eine Inspektion.</p>
53     "!"
54     "!" @parameter iv_inspection_key | <p class="shorttext synchronized">Schlüssel der Inspektion.</p>
55     set_as_runtime_for_inspection
56     IMPORTING
57         iv_inspection_key TYPE sci_inkey,
```

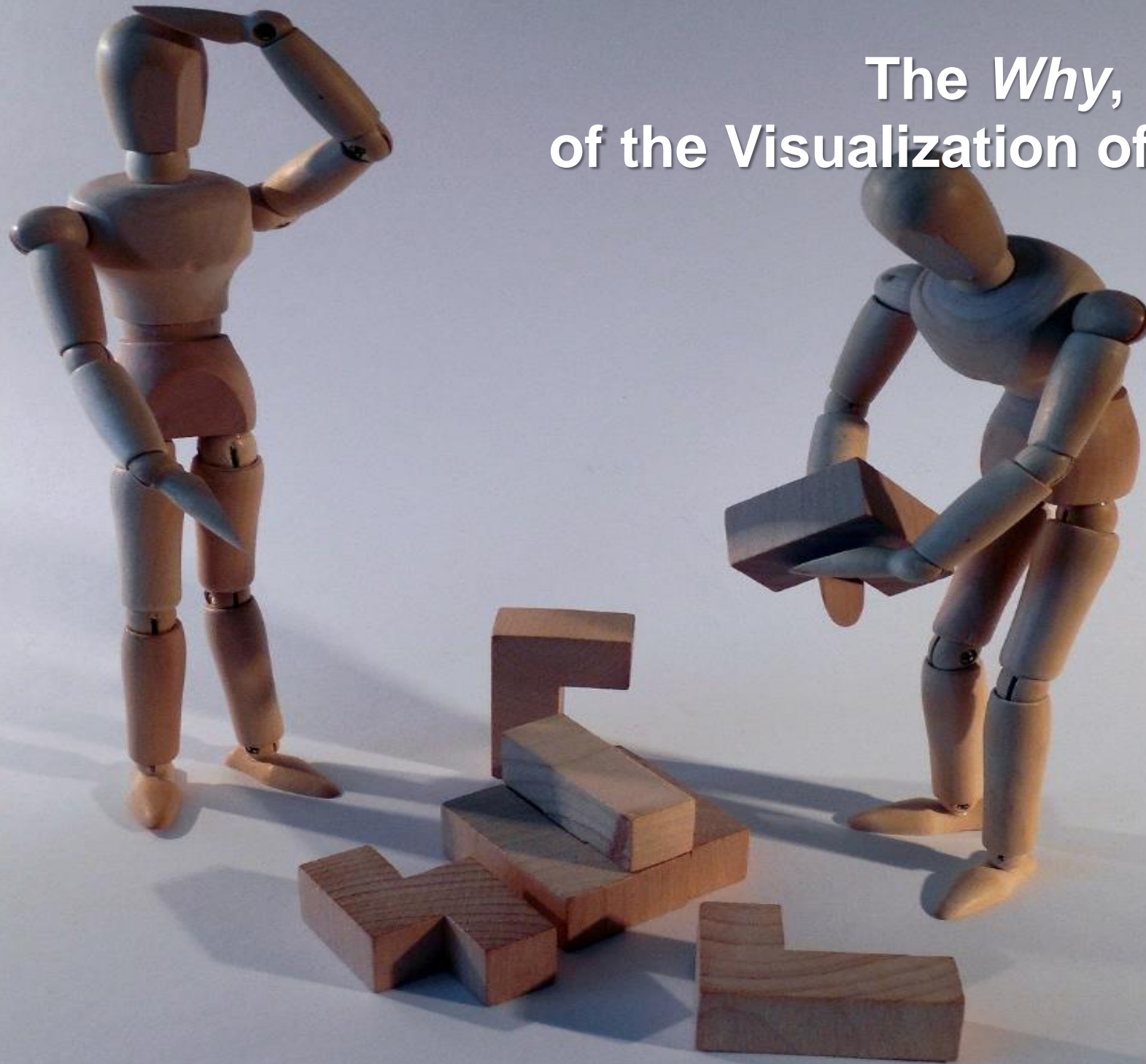
Method

Method

Attribute



The *Why*, *What* and *How* of the Visualization of SAP Systems



What is a SAP-System?

A big big database

Data that the user needs

„Smaller“ applications
working on the database

How does a SAP-System works?

Everything is a database table

Your code is in a table

Your class definitions
are in a table

Also code versions
are stored in tables

There is even a table of
all tables of the SAP-System

How to develop in a SAP-System?

Every tool is integrated
into the SAP-System

The editor

The debugger

The version system

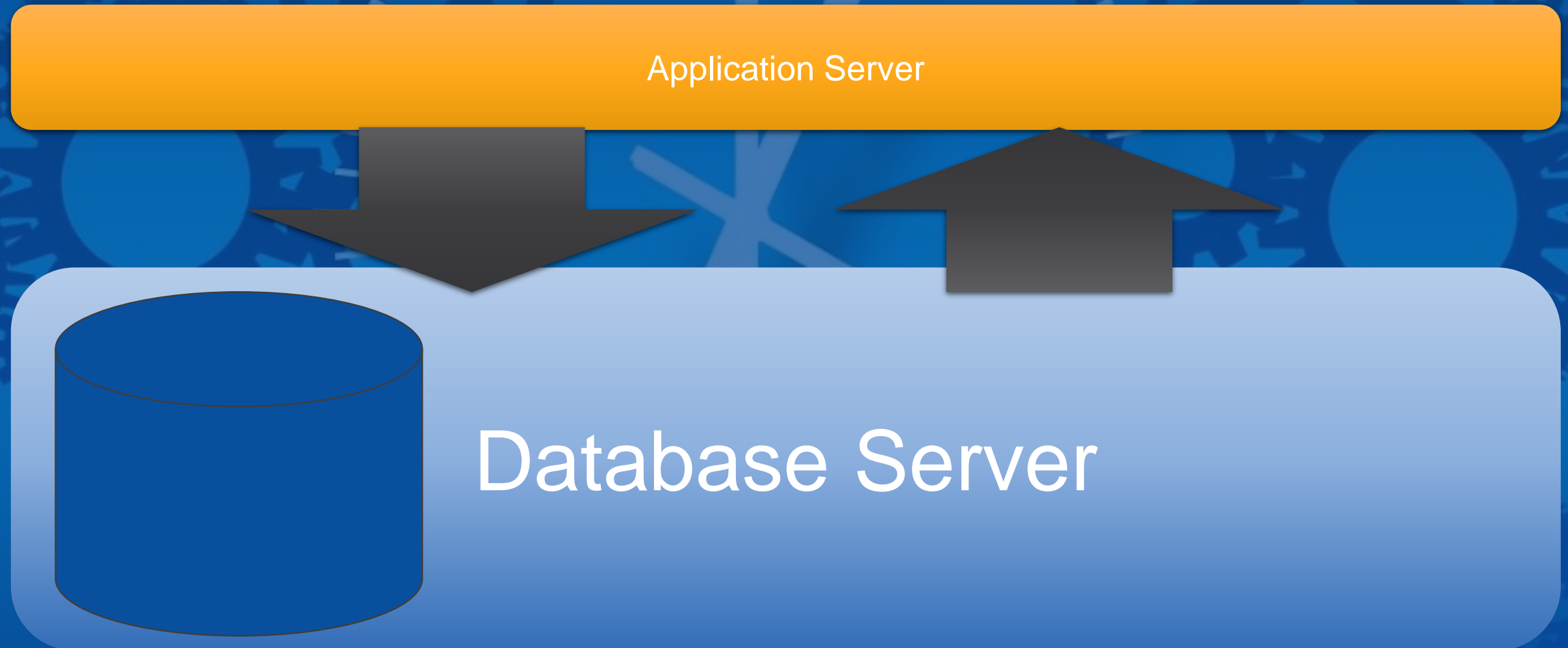
You can debug the debugger
if you like

How is a SAP System deployed?

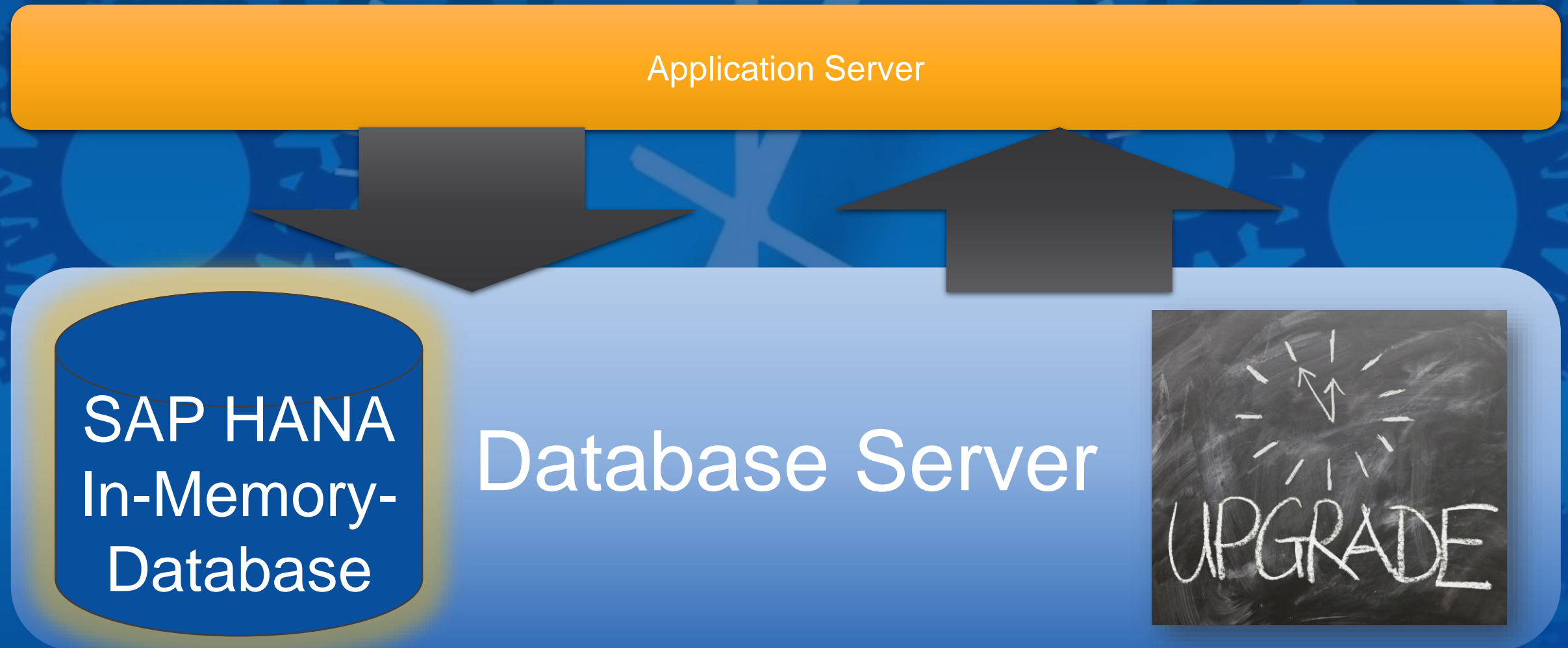
Application Server

Database Server

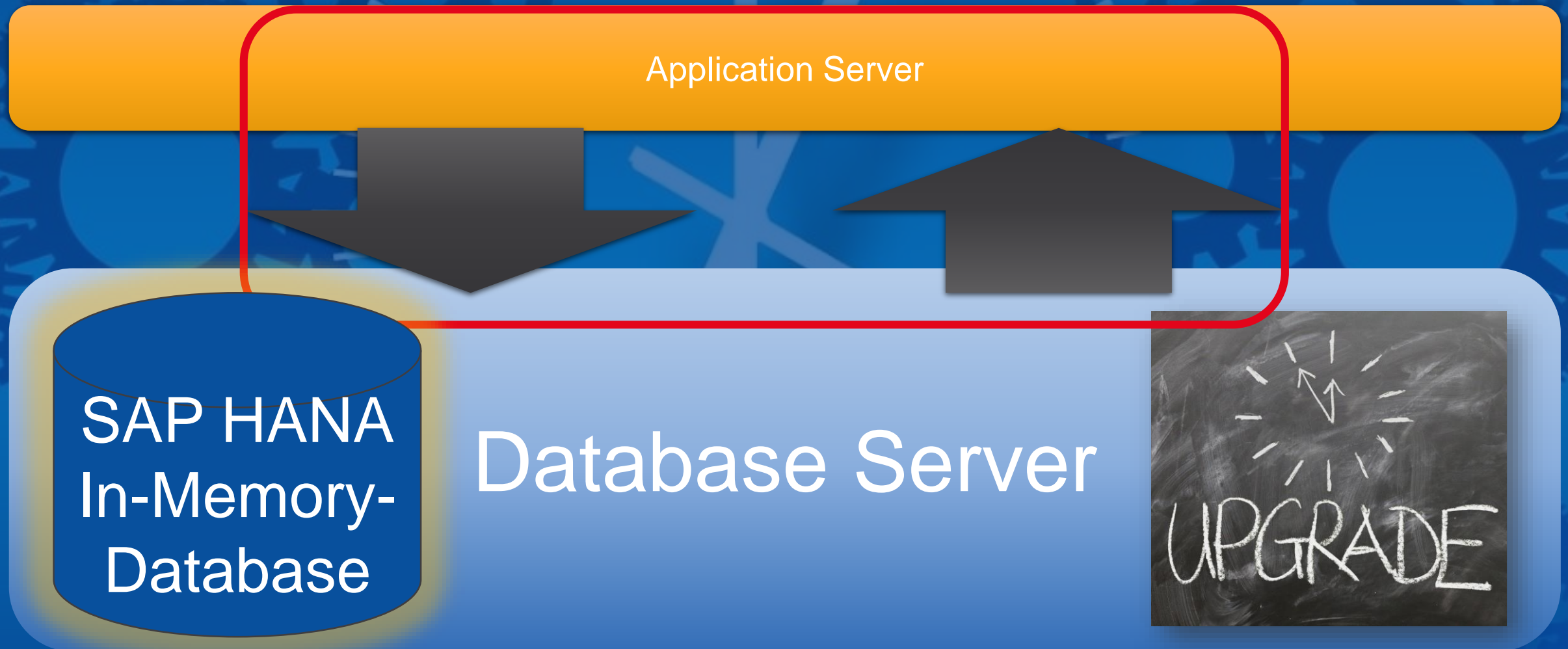
...so the main influence factor on SAP System performance is...



...so the solution is...

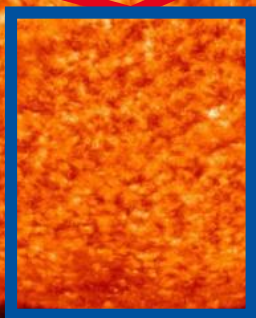
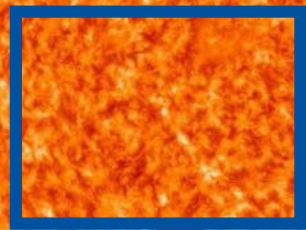


Ok, everything good so far?
... and what's about the usage of the database?



How is the code of a SAP System structured?

SAP-Standard-Code



What is the influence on performance?

What is used

How it is connected

Custom Code



Also big, complex and grown historically

Migration S/4 HANA
Biggest migration ever?

In-memory database HANA
with new depending code features

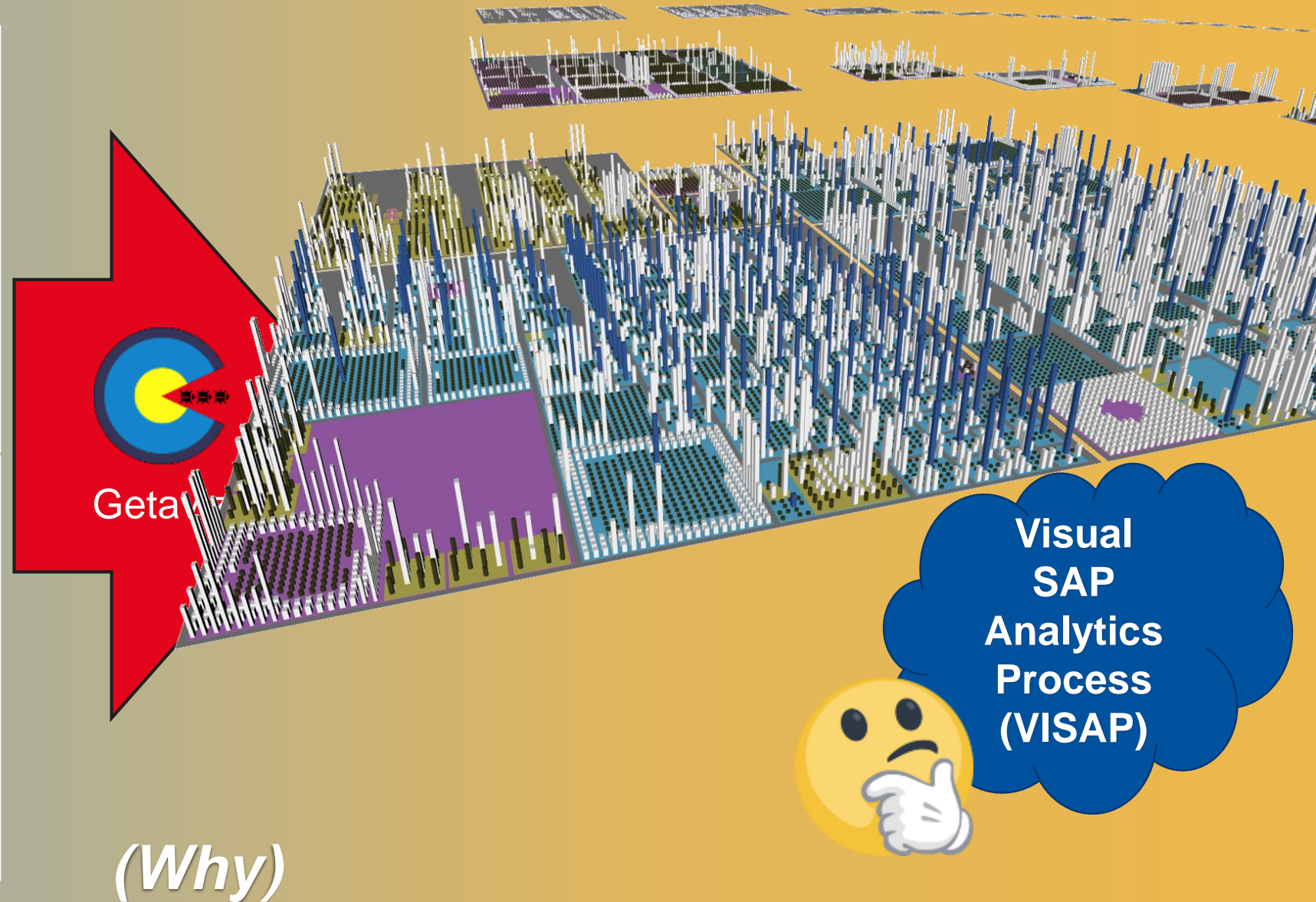
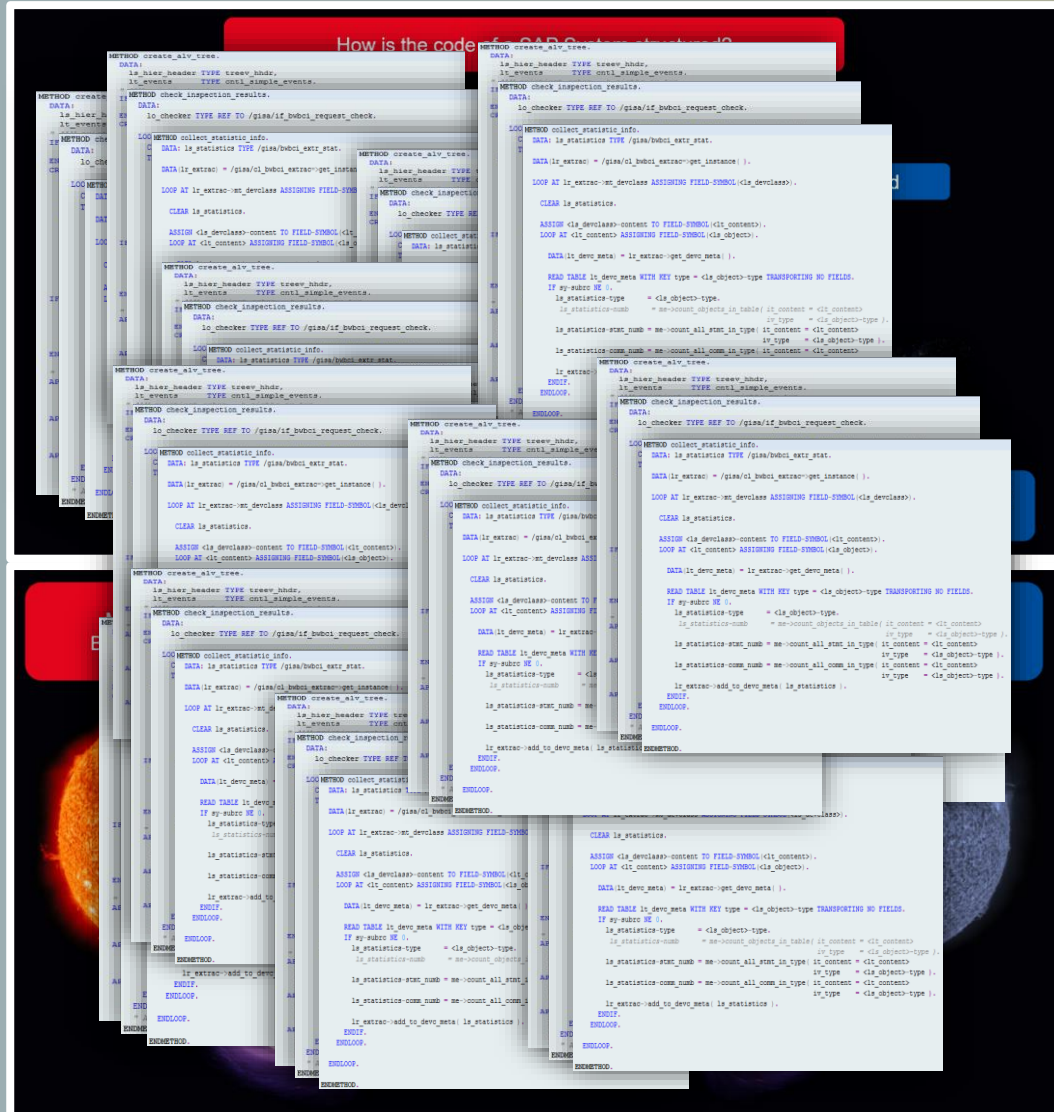
SAP R3

S/4HANA

What happens to the custom code?

Huge challenges
need new innovative approaches

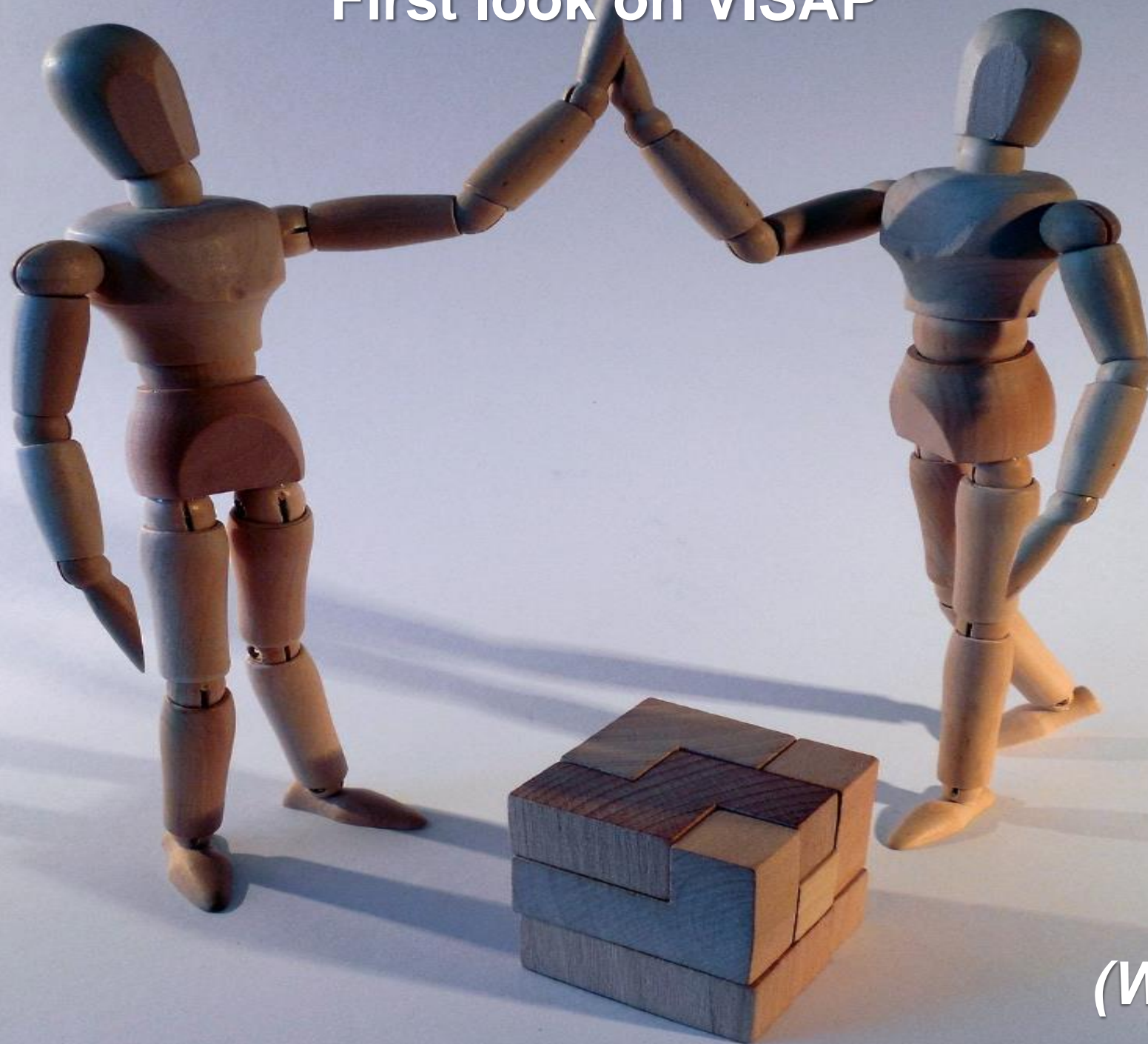
Software visualization in 3D for
visual analytic of custom code



Visual
SAP
Analytics
Process
(VISAP)

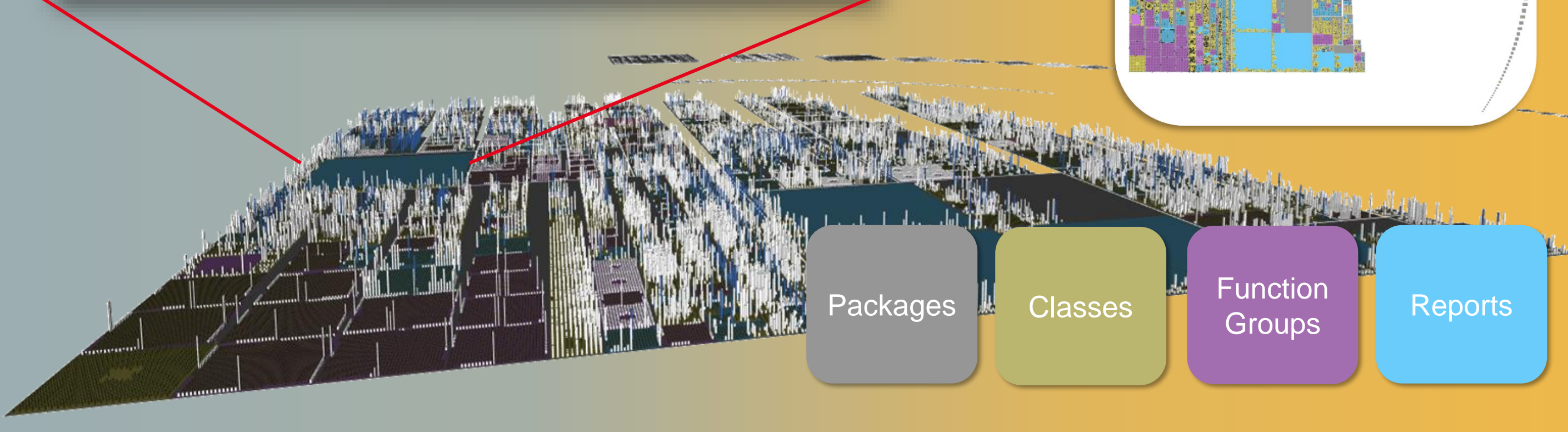
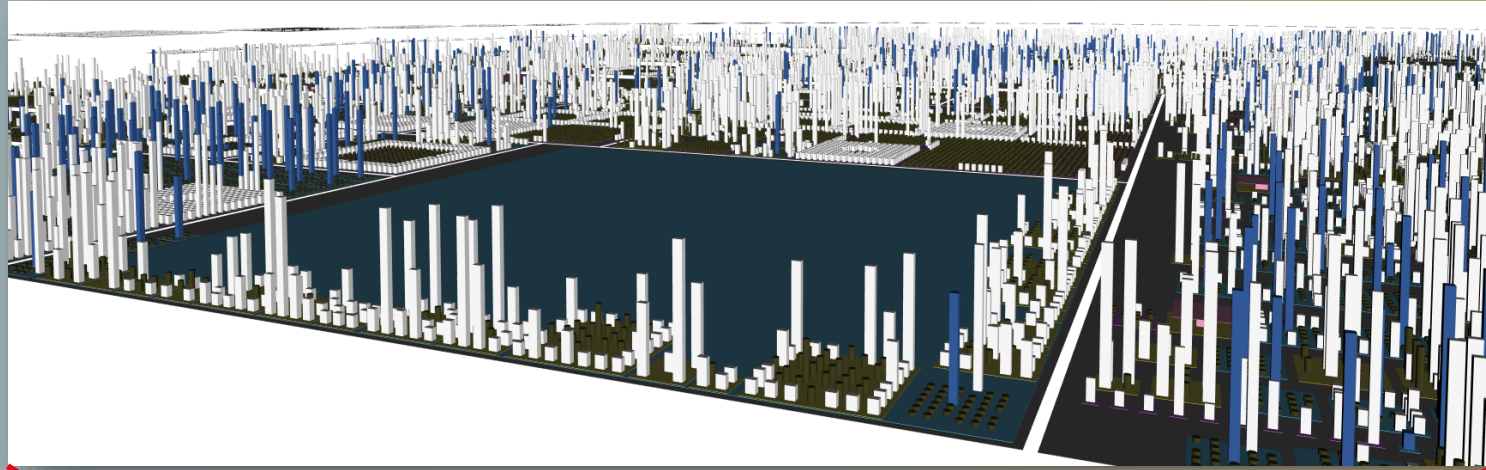


First look on VISAP



(What and How)

A first visualization of a customer SAP system



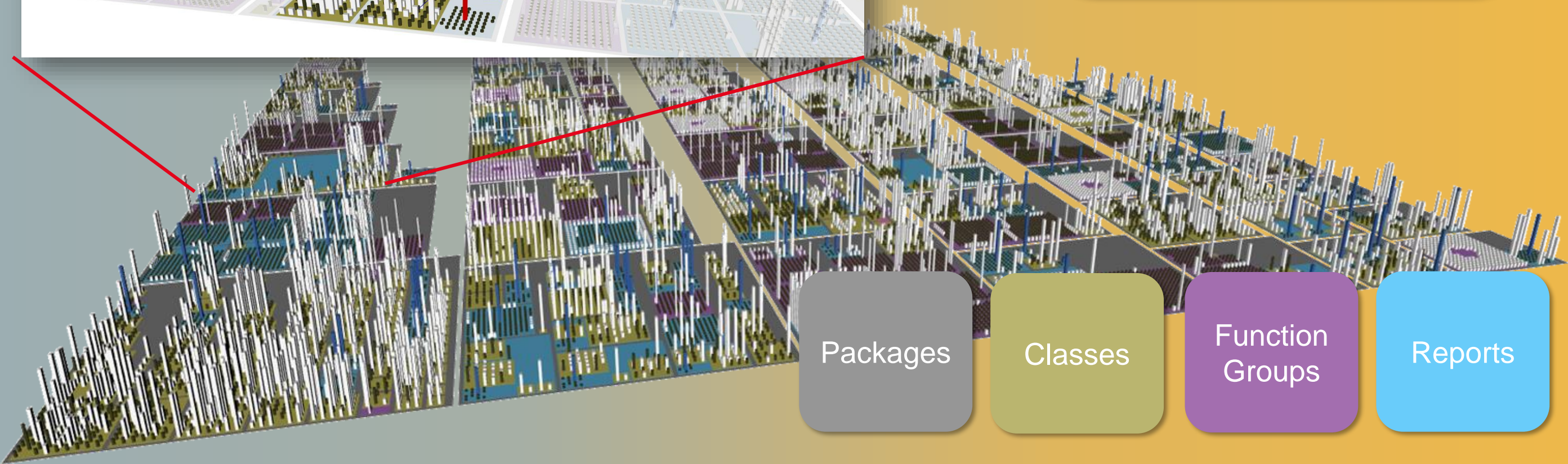
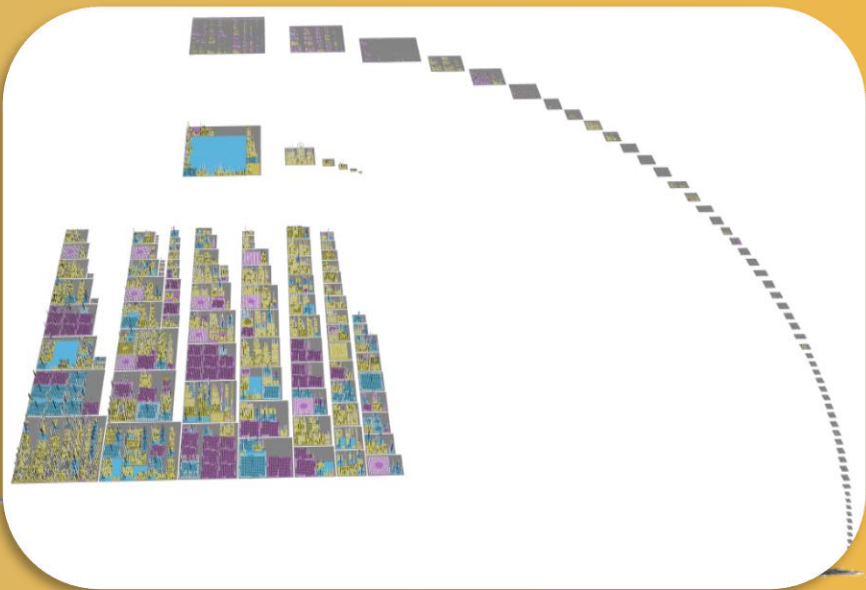
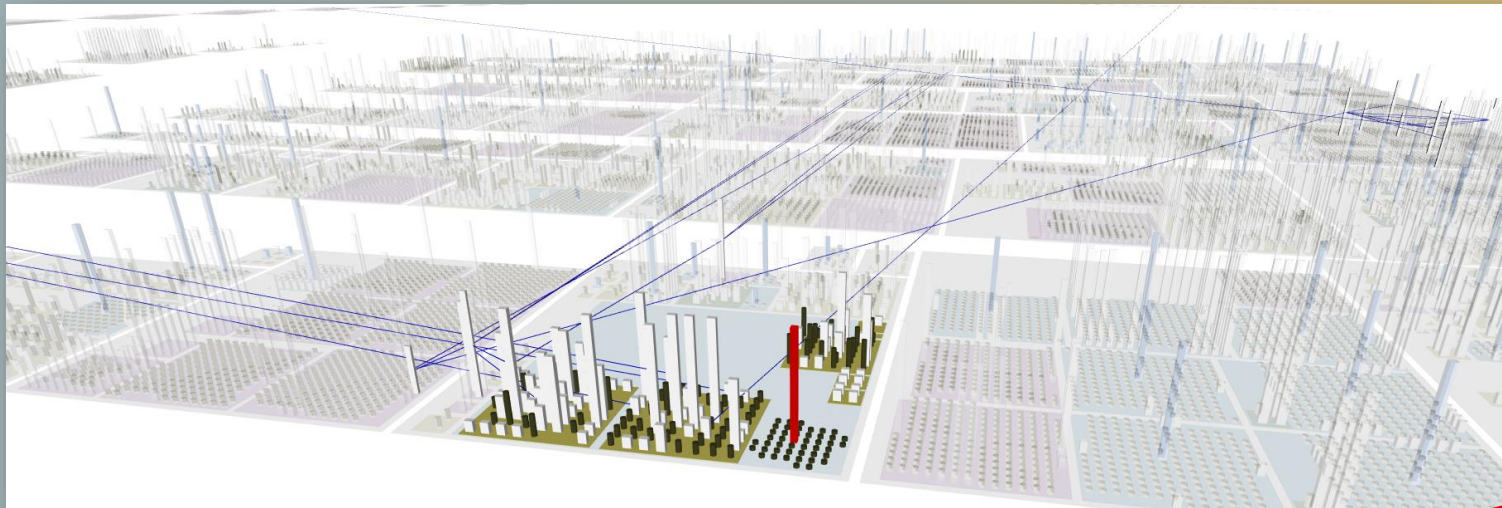
Packages

Classes

Function
Groups

Reports

A detailed view of another example



Packages

Classes

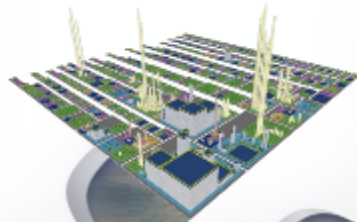
Function Groups

Reports

VISAP is part of the larger solution Central Custom Code Lifecycle Management by GISA

**Amount,
structure and
dependencies as
basic data**

Visualization



Inspection

**Code quality
metrics**

**Use (or not use)
in production**

**Custom
Code**

Usage

Migration

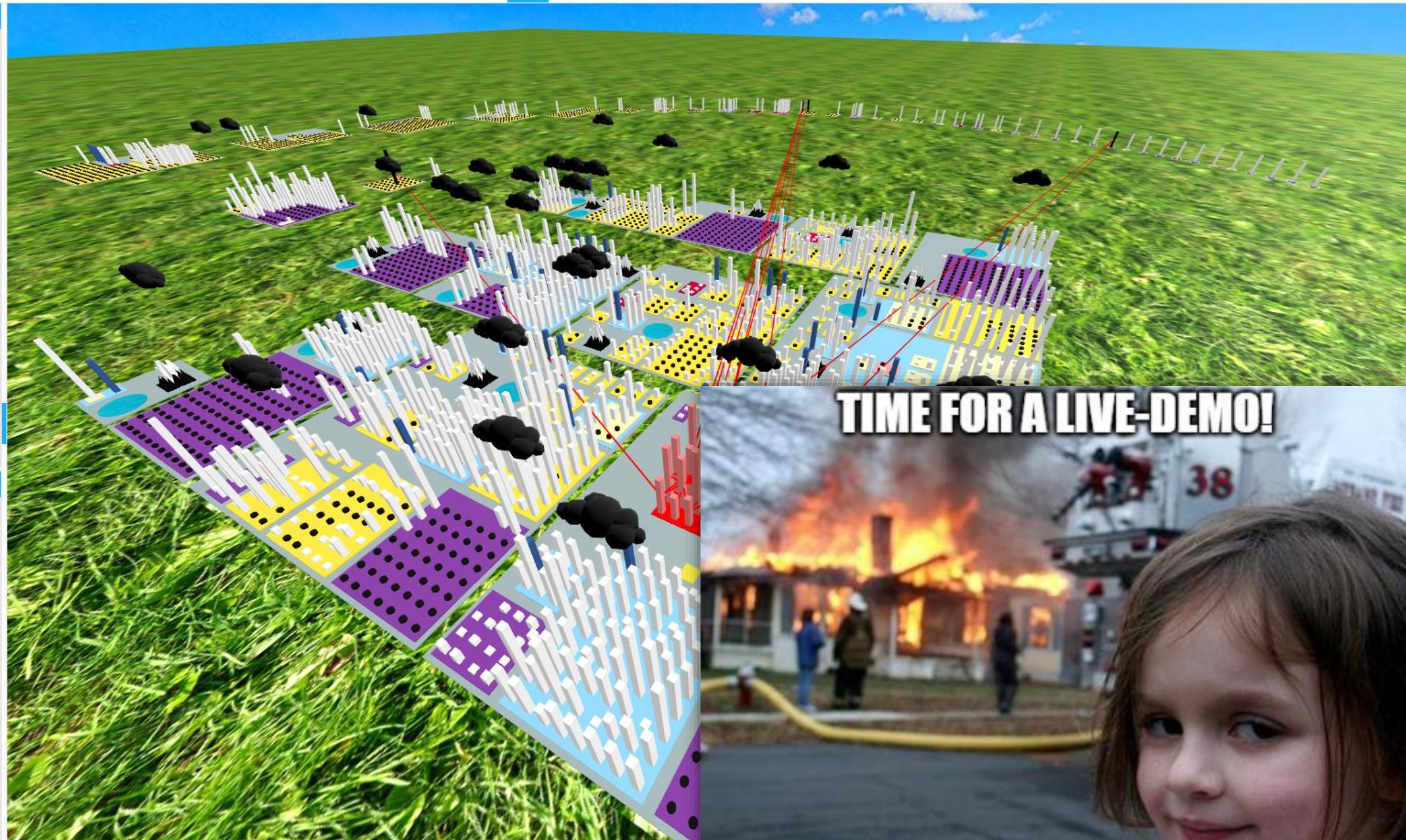
**S/4HANA
migration issues**

Package Explorer

- > ☒ /GSA/AQP
- > ☒ /GSA/BEX
 - > ☒ /GSA/BEX_C
 - > ☒ /GSA/BEX_GRID_UPDATE
 - > ☒ /GSA/BEX_GRID_UPDATE_TO_REGION
 - > ☒ /GSA/BEX_HISTORY
 - > ☒ /GSA/BEX_HISTORY_VIEW
 - > ☒ /GSA/BEX_KONTEXT
 - > ☒ /GSA/BEX_PROCESS_FLAGS
 - > ☒ /GSA/BEX_UPLOAD
 - > ☒ /GSA/BEX_USER_EXIT_MEM
 - > ☒ /GSA/CL_BEX_VIS_EVENT_HANDLER
 - > ☒ /GSA/CL_GRID_UPDATE
- > ☒ /GSA/BEX_ARCHIV
- > ☒ /GSA/BEX_GN
- > ☒ /GSA/BEX_MSB
- > ☒ /GSA/BEX_SN
- > ☒ /GSA/BEX_SN_VIS
- > ☒ /GSA/BEX_TV

Legend

- > ☒ Elements
 - > ☒ Package
 - > ☒ Class
 - > ☒ Interface
 - > ☒ Report
 - > ☒ Function Group
 - > ☒ ReferenceBuildings
 - > ☒ Mountain
 - > ☒ Cloud
 - > ☒ Lake
- > ☒ Navigation
 - > ☒ Move
 - > ☒ Zoom
 - > ☒ Rotate



TIME FOR A LIVE-DEMO!

WHAT SHOULD GO WRONG?

How are the data of the modules integrated in VISAP?



Visual SAP Analytics Process (Central VISAP 2.0)



Central Custom
Code Lifecycle
Management
System

CSV

VISAP
Extractor

VISAP
Exporter

Neo4J
Import



Getaviz (Version 2.0)

City Generator

A-FRAME

User
Interface

Additional Data
(Inspection, Migration, Usage ...)

Analysis
Report

Visual
Analytics

Realisation in projects

Derive recommendations
for action



VISAP Future Work

The background of the slide is a stylized illustration of a construction site at sunset. Several large tower cranes are silhouetted against a sky that transitions from a deep blue at the top to a warm orange and yellow near the horizon. In the foreground, the dark silhouettes of building structures under construction are visible.

Evaluation of the application in
customer and internal projects

Dynamic lazy loading
and layouting

Integration of additional data
and interaction techniques

Optimization of the visual
representation

Visualization of additional SAP
elements and relationships



Thank you for your attention

A close-up photograph of two hands shaking in a firm grip. The hands are wearing dark blue business suits with white striped shirts. The background is blurred, showing other people in a professional setting.

**IT
works.**

**Boost
your
Career!**

www.gisa4u.com



GISA[®]
That's IT.



Pascal Kovacs

Head of Development & Migration
Senior Development Consultant

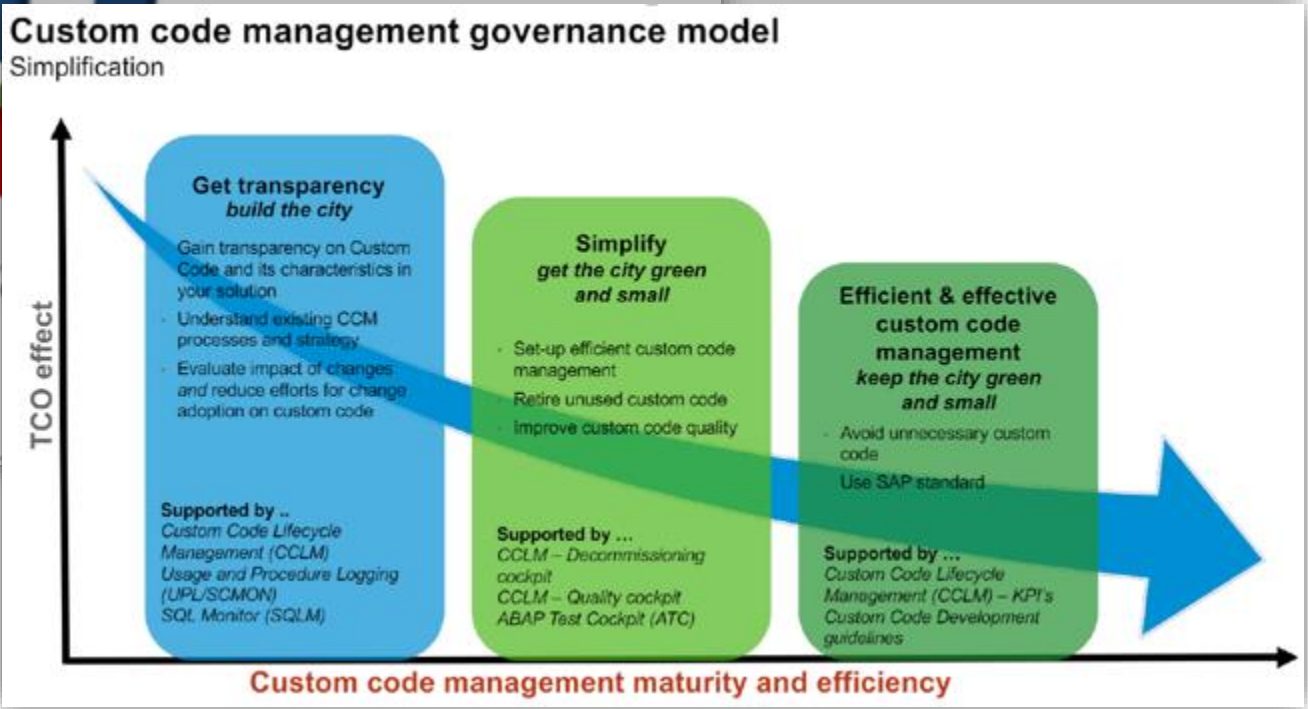
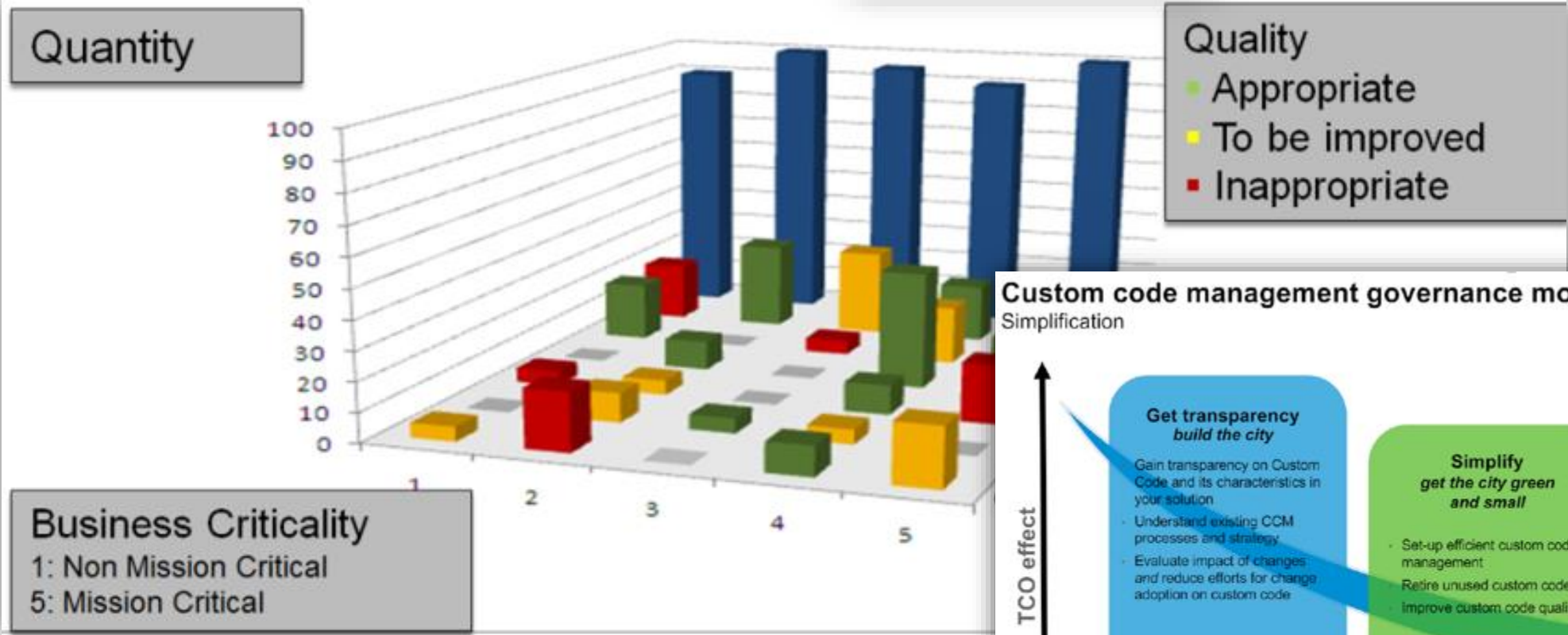
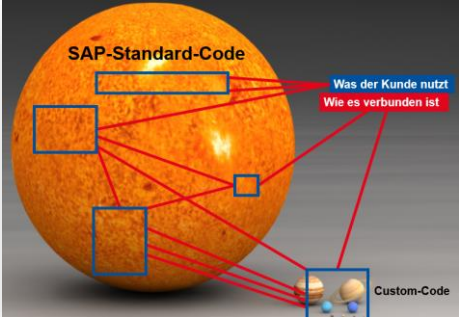
✉ pascal.kovacs@gisa.de

☎ +49 345 585-2302

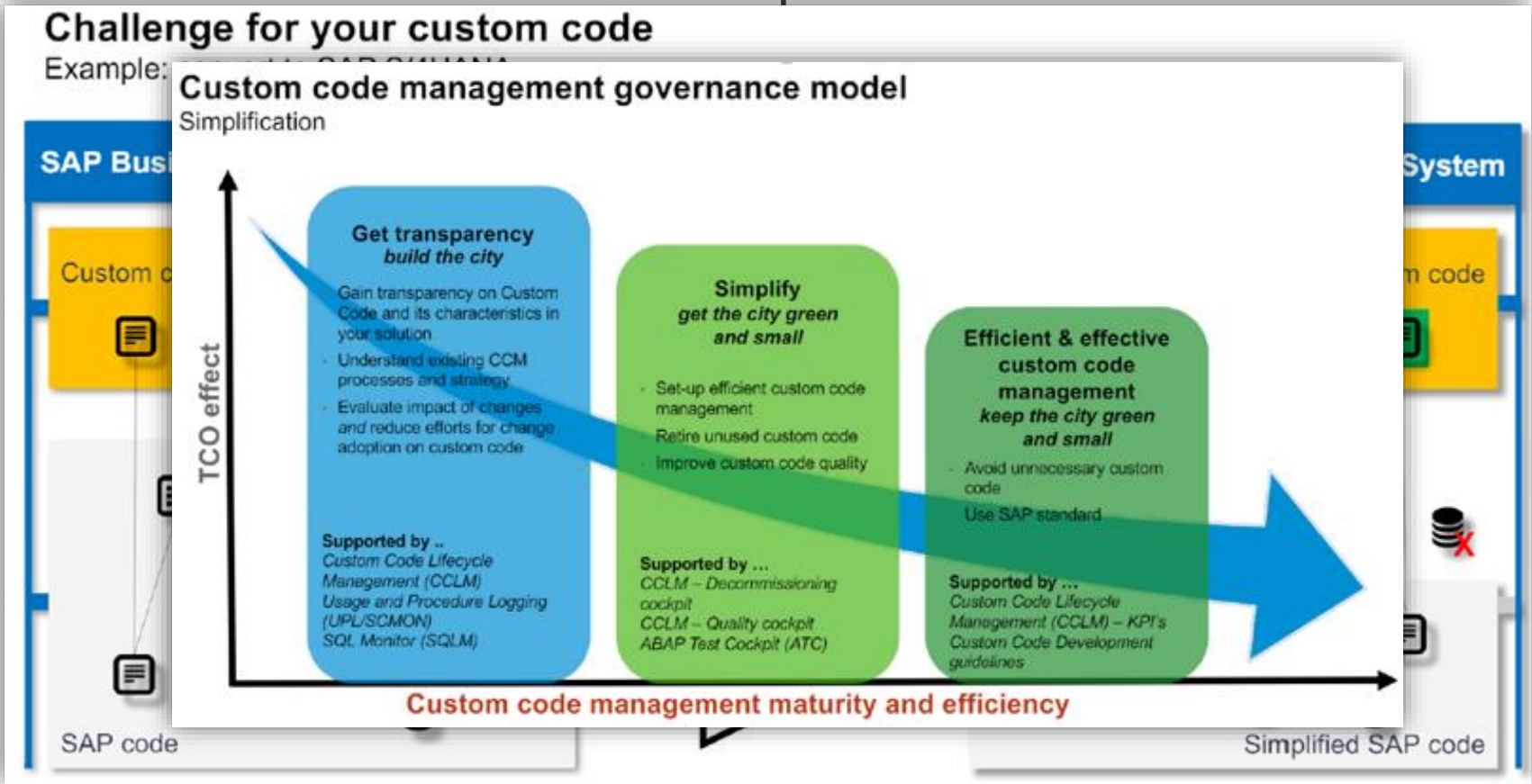
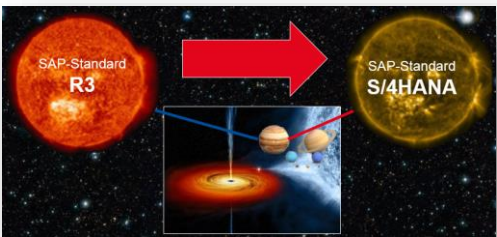
💻 www.gisa.de

BACKUP

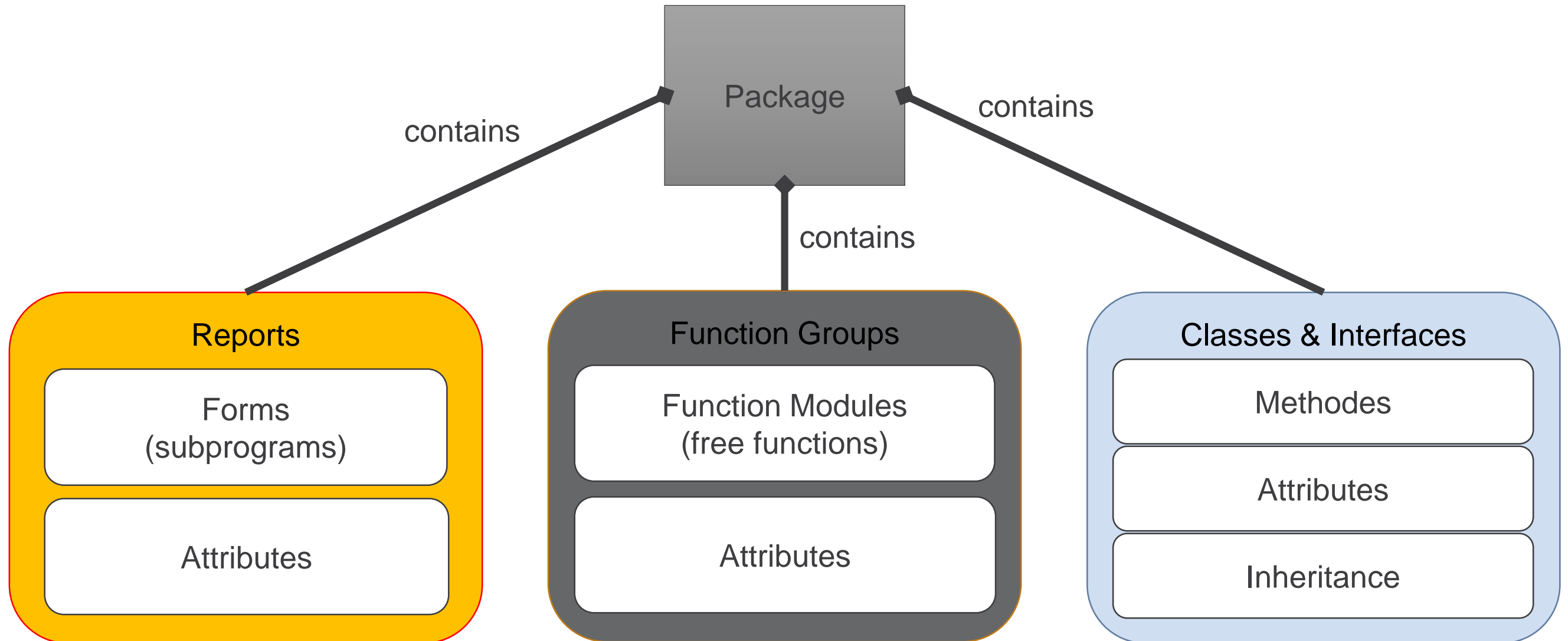
System Analysis with SAP



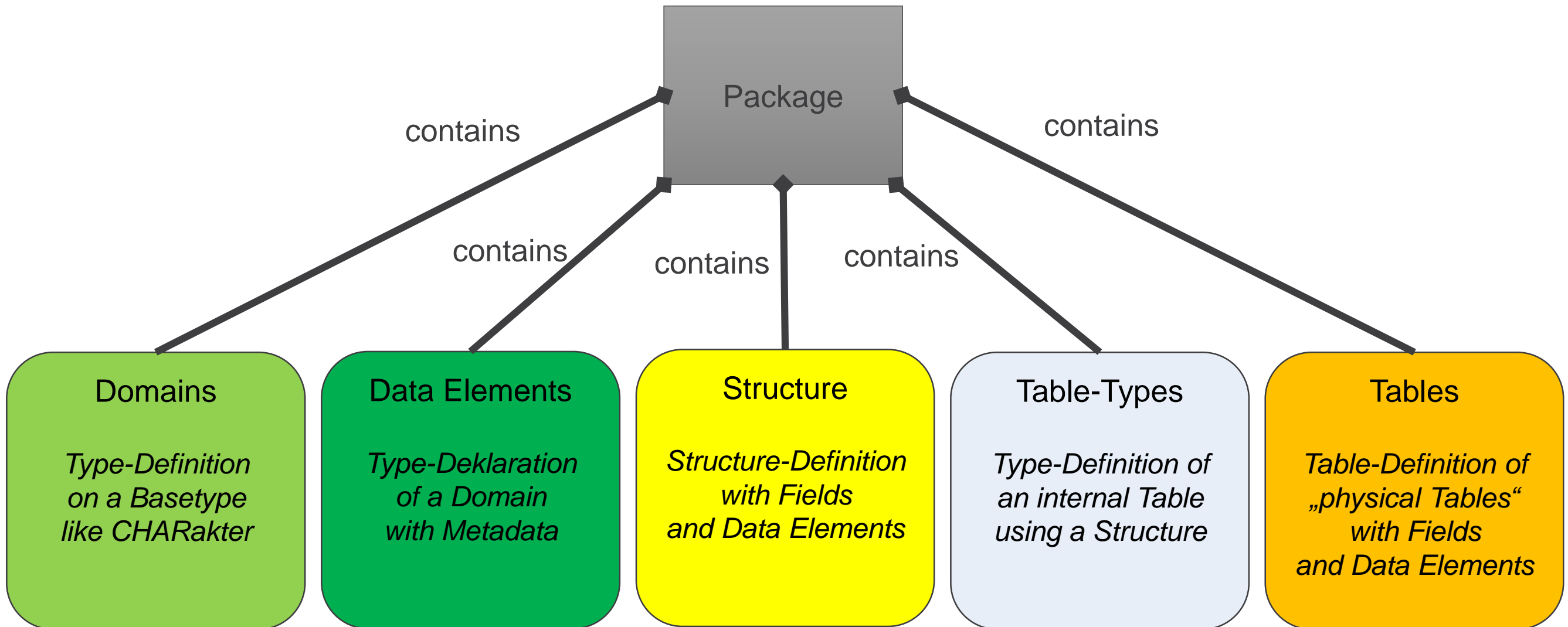
System Upgrade with SAP



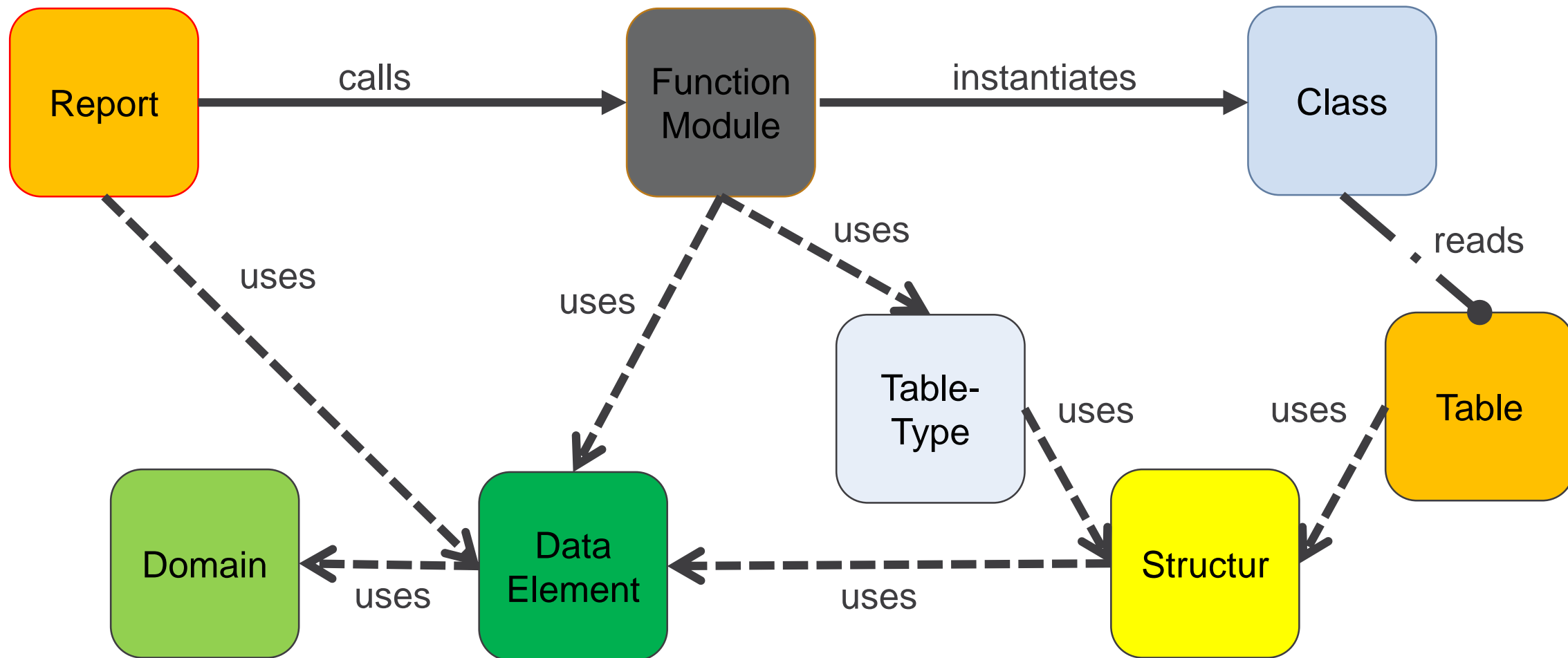
Source-Code-Elements



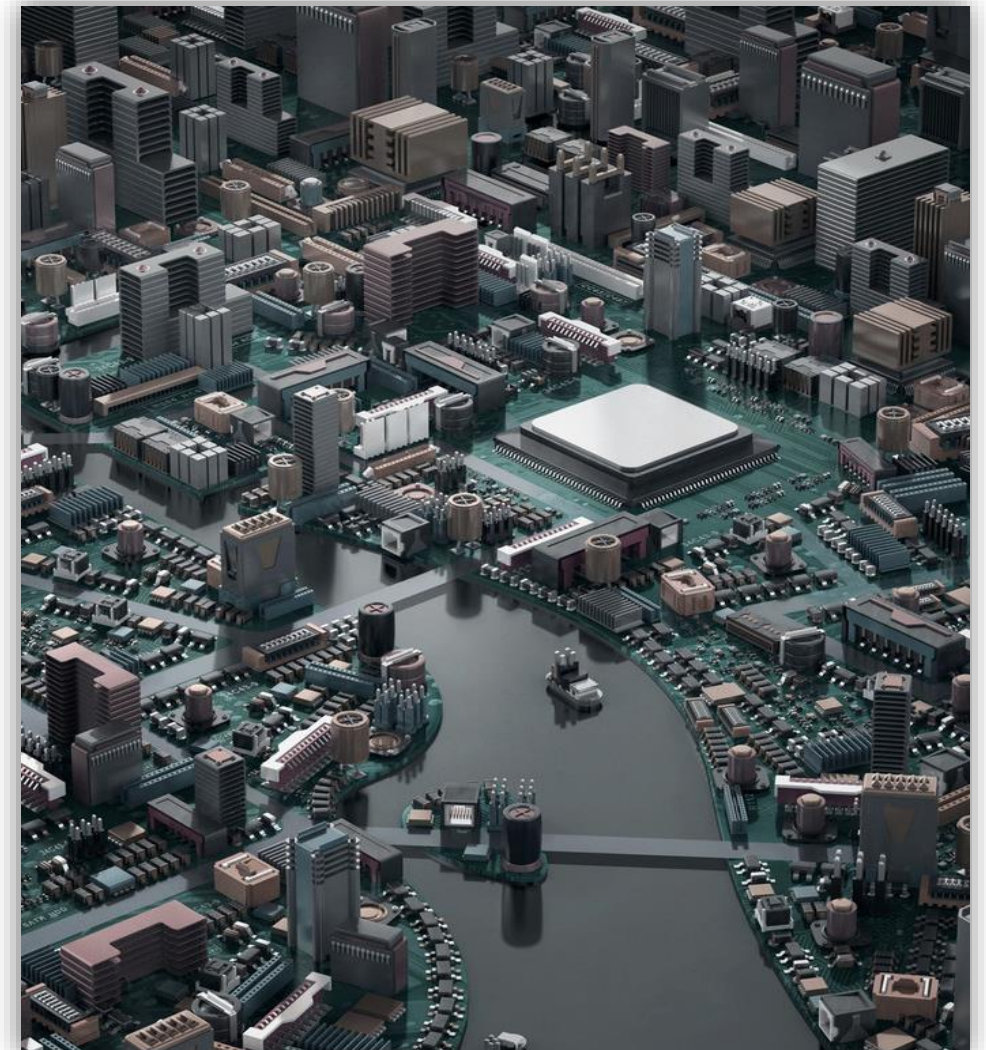
Data-Dictionary-Elements (DDIC)



Dependencies between ABAP-Elements



Vision ABAP-Metropolis-Metaphor



The Idea...

Source-Code-Elements

Does something

Uses something

Consumes & produces something

Work

Worker

Products



Data-Dictionary-Elements

Does nothing alone

Is used by SC-Elements

Stores something

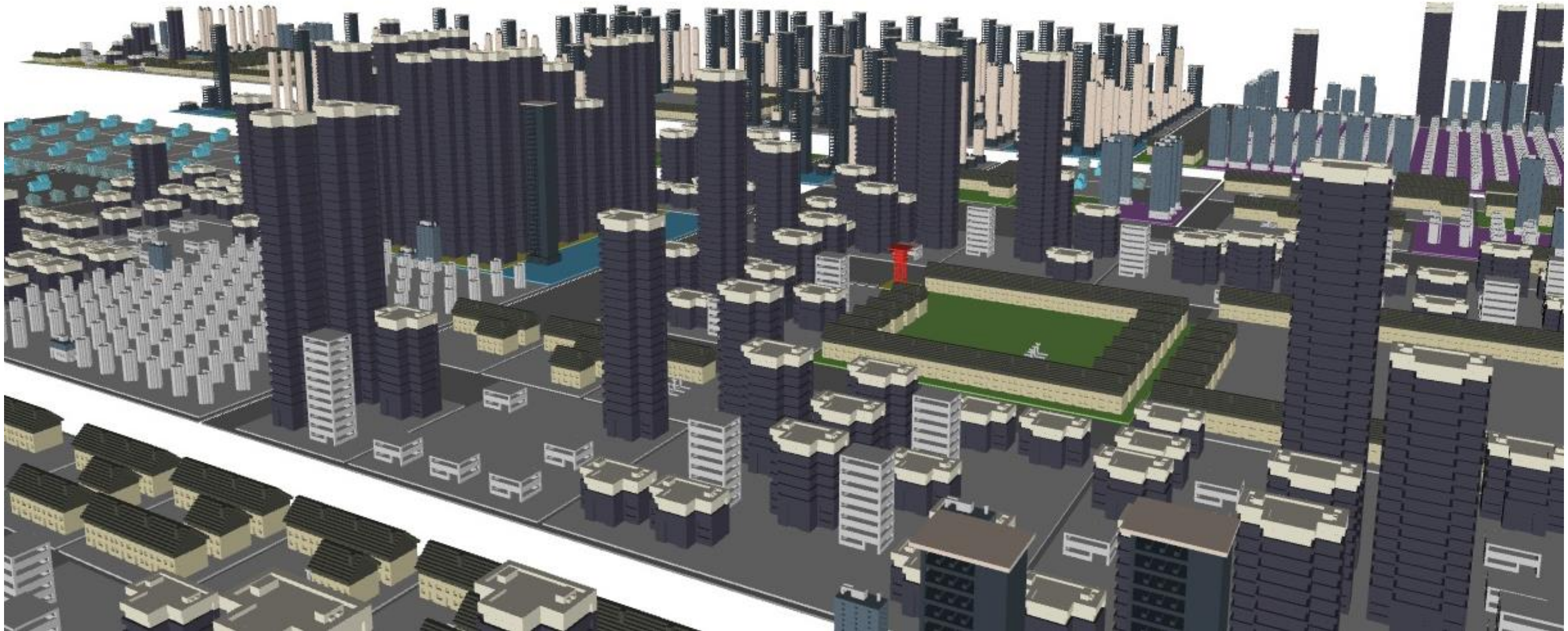
Inhabitants

Worker

Product storage



ABAP-Metropolis-Metaphor – a first view



ABAP-Metroplois – Source-Code-Elements



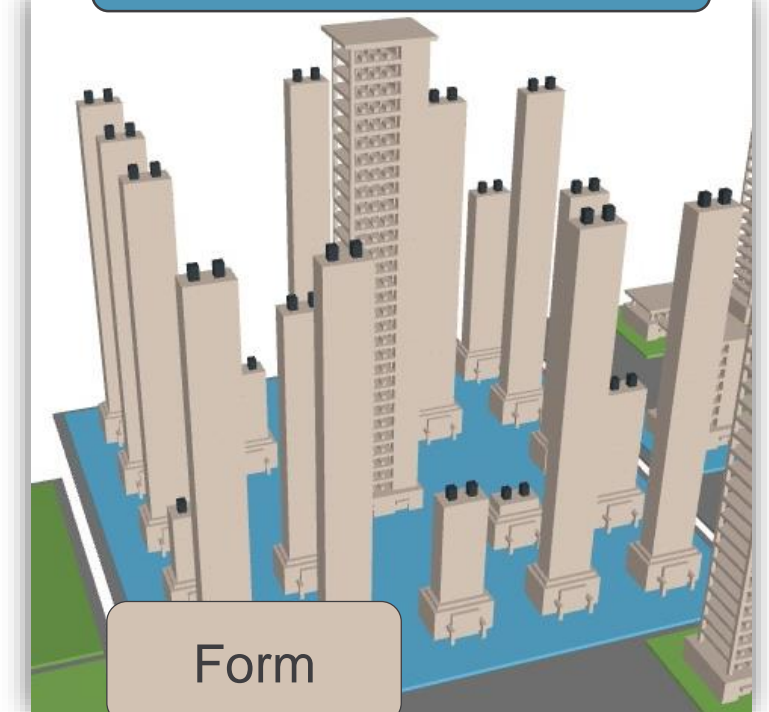
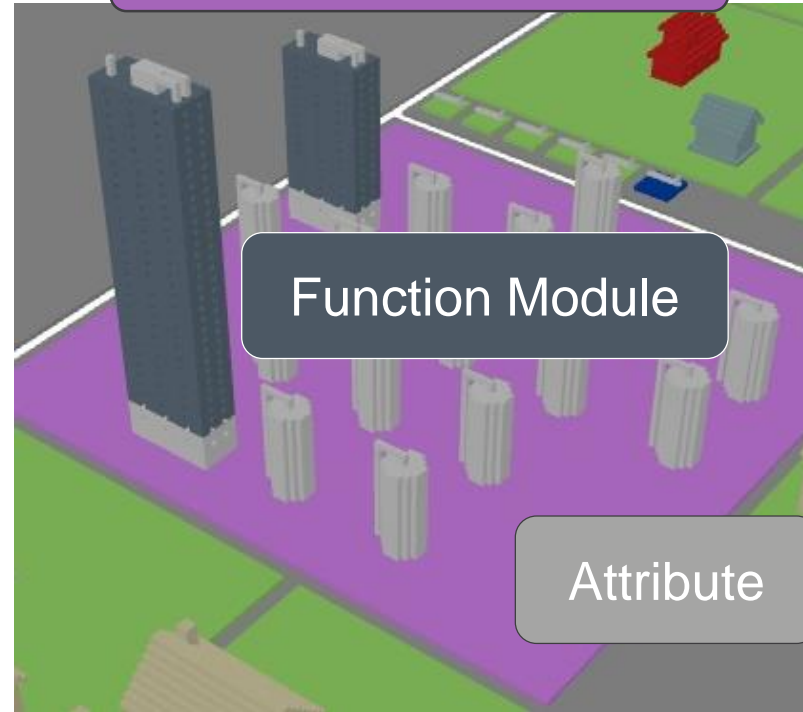
Class District



Function Group District



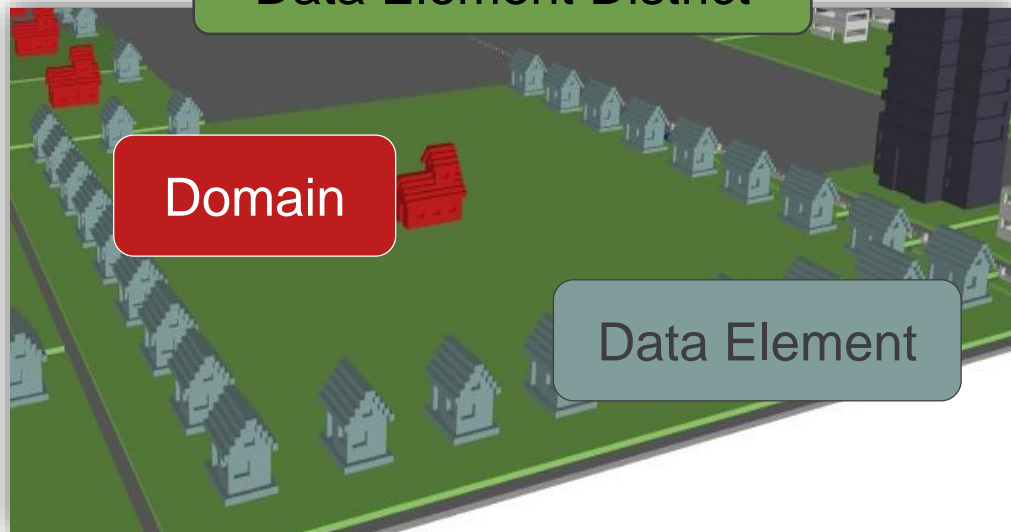
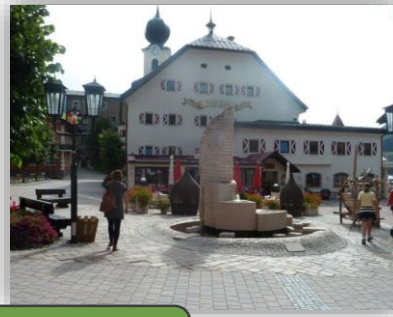
Report District



ABAP-Metropolis – Data-Dictionary-Elements



Data Element District



Structure District

