

BI&A Basics and Data Visualization

KRONES internal training



Agenda

Day 1

Introduction

Fundamentals

- Objectives and benefits
- BI&A architecture
- BI&A roles & processes

Day 2

Review and questions

Data visualization with Report Builder

- Use cases of Report Builder
- Reporting server and strategy
- Case studies and examples (template and basics)

Data visualization with Excel

- Fundamentals Reporting Services
- Use cases of Excel Reporting
- Excel Pivot
- Case studies and examples

Data visualization with Report Builder

- Case studies and examples (functions and presentation)

Review, outlook and questions

Day 1

Introduction

Fundamentals

Data visualization with Excel

Day 2

Review and questions

Data visualization with Report Builder

Review, outlook and questions



Presentation of trainer and participants

Trainer

- Stefan Lautenschlager
- KRONES Employee since 2012
- Information Management: Business Intelligence and Business Analytics



Participants

- Name...
- KRONES Employee since...
- Department and responsibility...
- Expectations of this training...



Objectives and structure of the training

Objectives

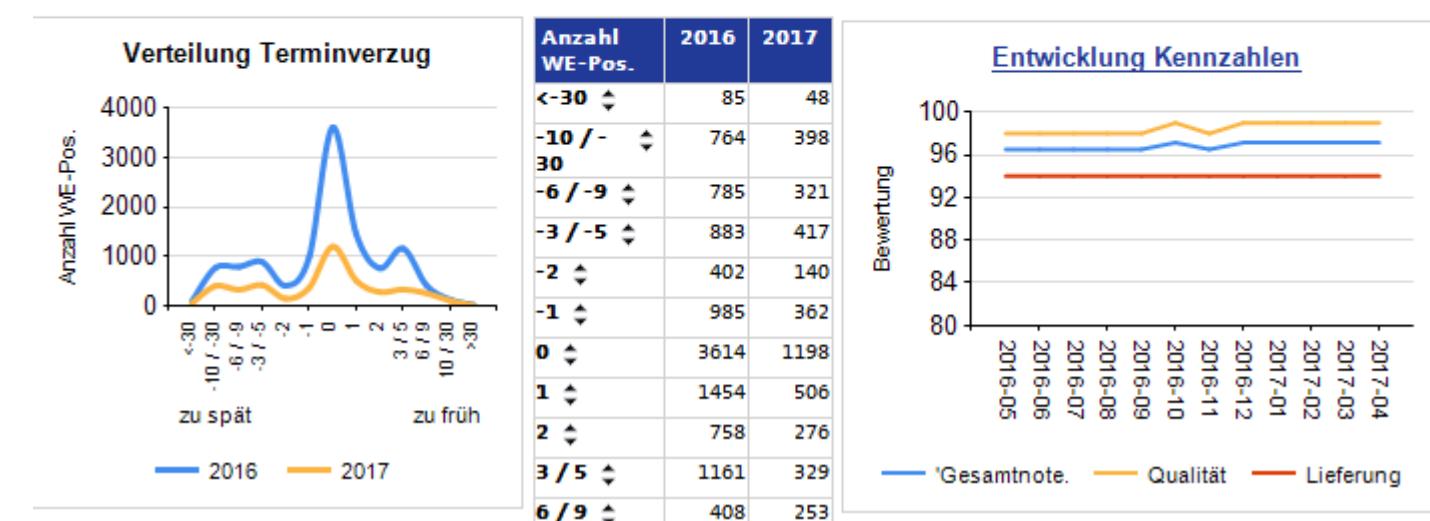
Participants will know about:

- What BI and BA are
- What each one is used for
- Architecture of BI&A
- Roles and boards within the topic
- BI&A processes at KRONES
- Authorization concept
- Reporting services and strategy
- Pro and contra of Excel and Report Builder
- When to use Excel or Report Builder
- How to build reports with Excel and Report Builder

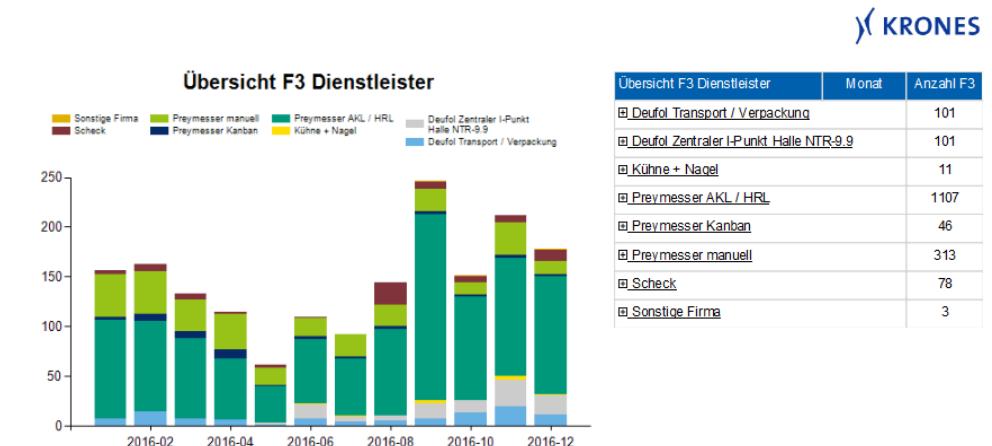
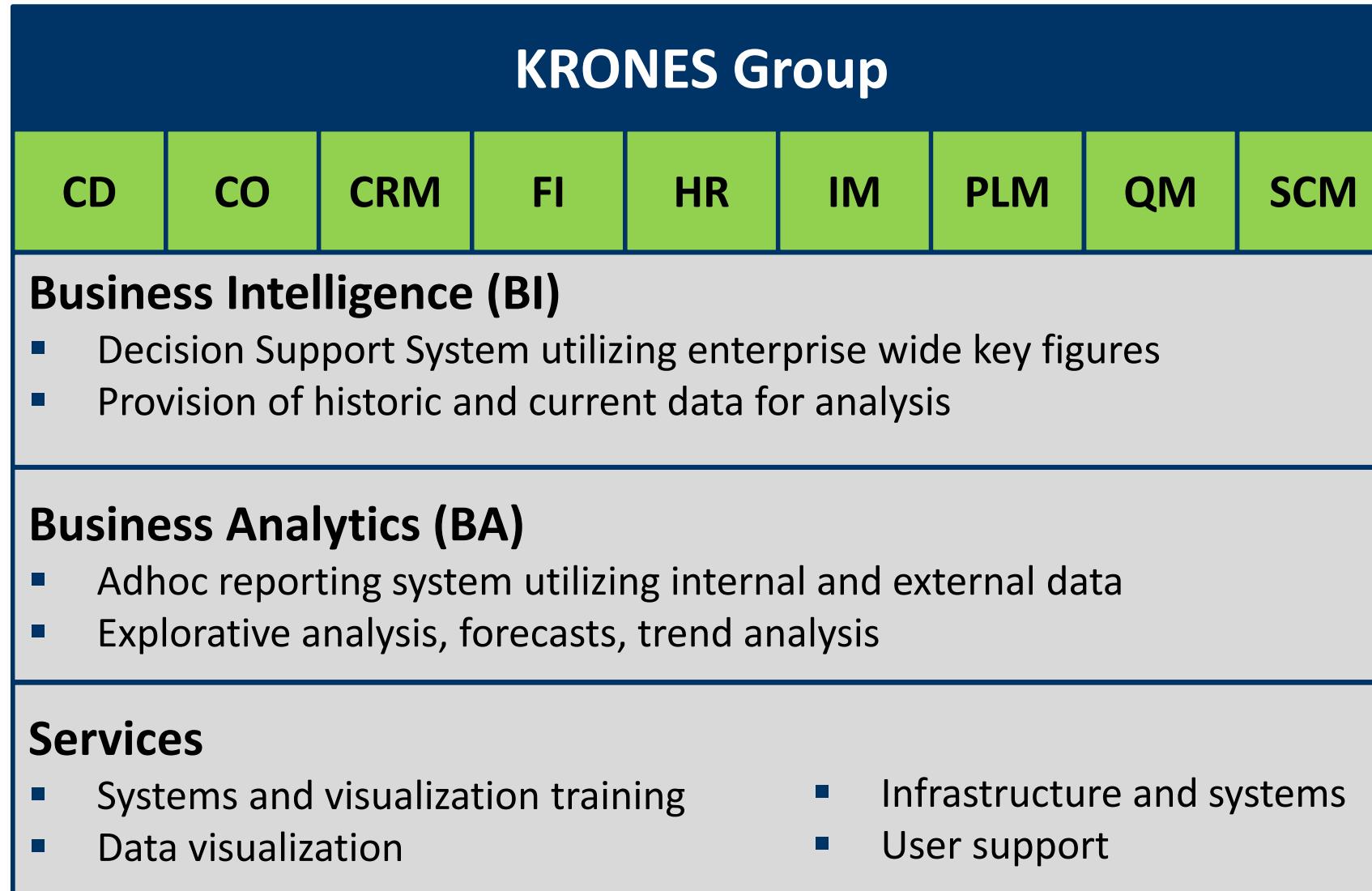
Structure

- 12 hours net training time
- 50% theory and discussion
- 50% hands-on practice
- Active participation desirable

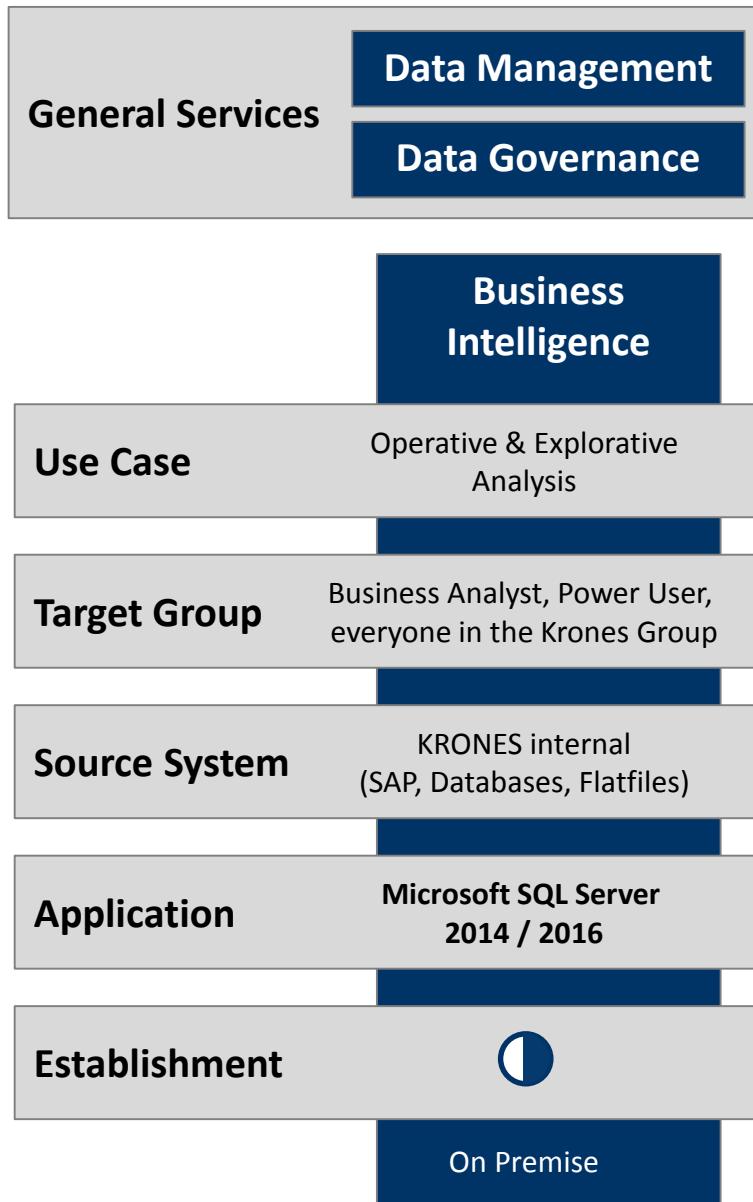
| Jahr | | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 |
|------|------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 2016 | WE-Pos. | 1.016 | 1.042 | 1.092 | 861 | 641 | 777 | 855 | 980 | 983 | 1.010 | 1.147 | 1.036 |
| | Anz. F2 | 14 | 11 | 7 | 9 | 3 | 6 | 9 | 15 | 7 | 8 | 8 | 9 |
| | fehl. Ant. | 1,38% | 1,06% | 0,64% | 1,05% | 0,47% | 0,77% | 1,05% | 1,53% | 0,71% | 0,79% | 0,70% | 0,87% |
| 2017 | WE-Pos. | 1.197 | 1.167 | 1.353 | 635 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Anz. F2 | 11 | 8 | 12 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | fehl. Ant. | 0,92% | 0,69% | 0,89% | 1,10% | 0,00% | 0,00% | 0,00% | 0,00% | 0,00% | 0,00% | 0,00% | 0,00% |



IM will provide the KRONES Group with a variety of data services



BI@Krones: Overview Cluster Business Intelligence



BI@Krones: Current status

Definition

- Informative search conducted by data consumers
- Management KPIs for decision making
- Operative KPIs
- Collecting, searching through and analyzing data to identify patterns and establish relationships

Use cases

- Standard reporting
- Ad hoc analysis
- Operative reporting

Technology portfolio

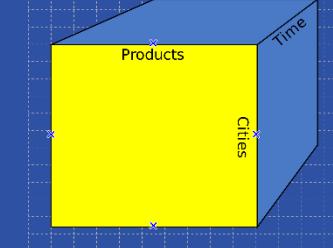
- Microsoft SQL Server 2016 (rdbms)
- Microsoft SQL Server 2014 (SSIS, SSAS)
- Microsoft Excel 2016
- Microsoft SQL Reporting Services 2016
- PowerBI

Data visualization

AD hoc
analysis

Standard
Reports

Data management



Enterprise Data Warehouse

Persistent Staging Area

Data ingestion

Other
Databases
(Voxtron)

Oracle
Databases
(EPP, ...)

SAP Systems
(ERP,CRM,
EWM,GTS,HR)

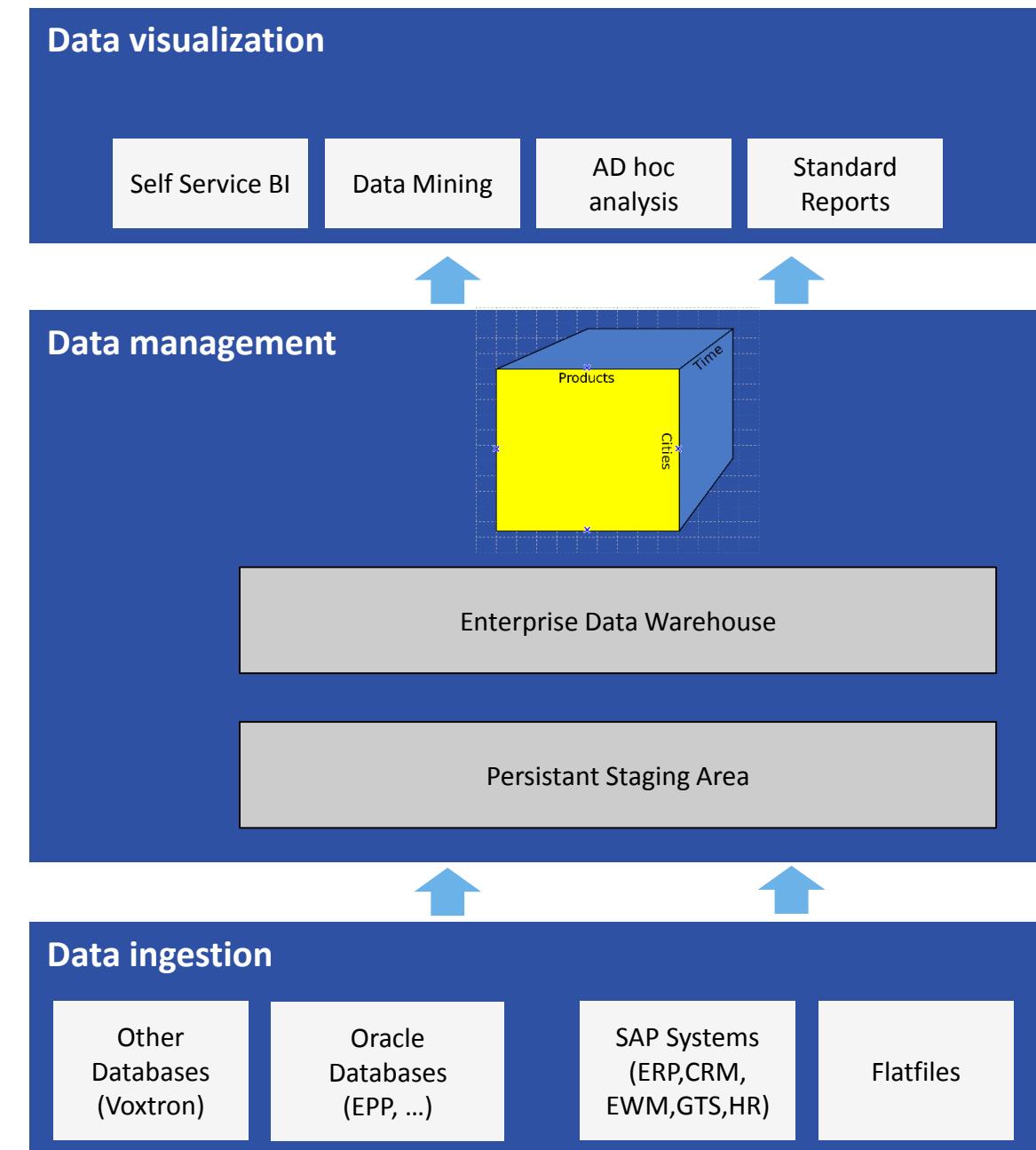
Flatfiles

BI@Krones: Outlook

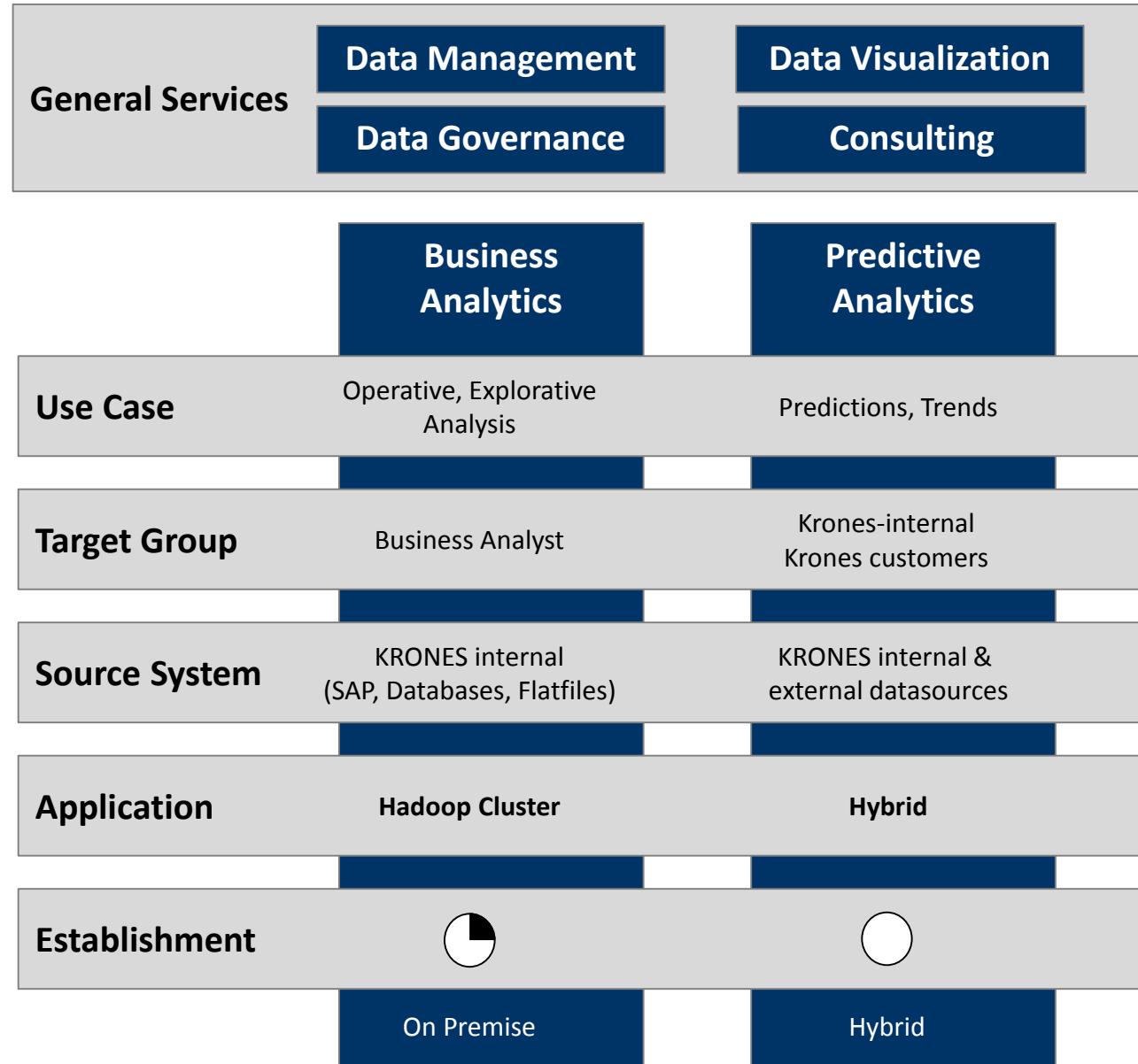
- Data visualization**
 - Project “Self Service Analytics Platform”
 - Team provides trainings for power users on SSRS, Excel

- Data management**
 - SQL Server Analysis 2017
 - SQL Server Integration Services 2017
 - Data Mining

- Organizational**
 - International collaboration (Indian colleagues)
 - BI&A strategic and operational board



BA@Krones: Overview Cluster Advanced Analytics



Maturity level:

business data science based analytics

patterns practical fields Probability applications mining entity includes enterprise management aspects fraud using understand computation definition field area study research resembles historical Statistics

may predicting process improving qualitative modeling people

realistic simple order decisions involved within Others

extensive order

process improving qualitative modeling people

process improving qualitative modeling people

process improving qualitative modeling people

BA@Krones: Current Status – Business Analytics

Definition

- Informative search used by data consumers
- Operative KPIs
- Narrow down data and information to form further analysis
- Collecting, searching through and analysing data to identify patterns and establish relationships

Methods

- Ad hoc analysis
- Operative reporting
- Data discovery
- Data mining

Technology portfolio

- Hadoop on-premise cluster (Hortonworks Data Platform 2.5)
- Microsoft Excel 2016
- Microsoft SQL Reporting Services 2016

Data visualization

Data exploration

Reports

Data management

Operations (Ambari)

Security (Knox, Ranger, HDFS, ...)

Data access (Hive, Spark, Solr, ...)

Cluster resource management (YARN)

Hadoop Distributed File System(HDFS)

Landing Zone

Data Lake

Reservoir



Data ingestion

Oracle Databases

EDW

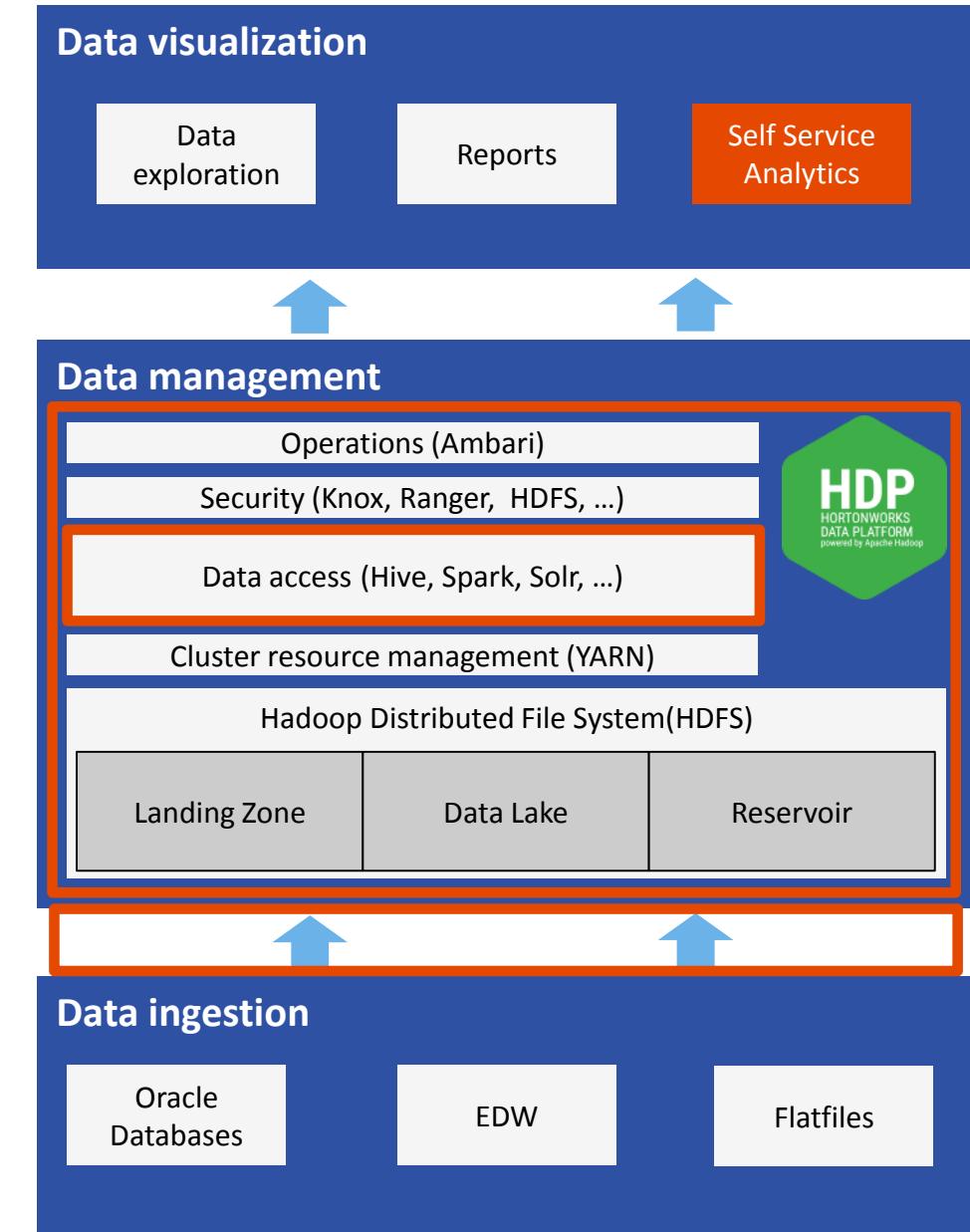
Flatfiles

BA@Krones: Outlook – Business Analytics

- Data visualization**
 - Project “Self Service Analytics Platform”
 - Team provides trainings for power users SSRS Excel

- Data management**
 - Project “Data Flow Automation”
 - Evaluate and implement Spark
 - Upgrade HDP version (2.6.x)
 - Evaluate SAP Vora

- Organizational**
 - International collaboration (Indian colleagues)
 - BI&A strategic and operational board



BA@Krones: Current Status – Predictive Analytics

Definition

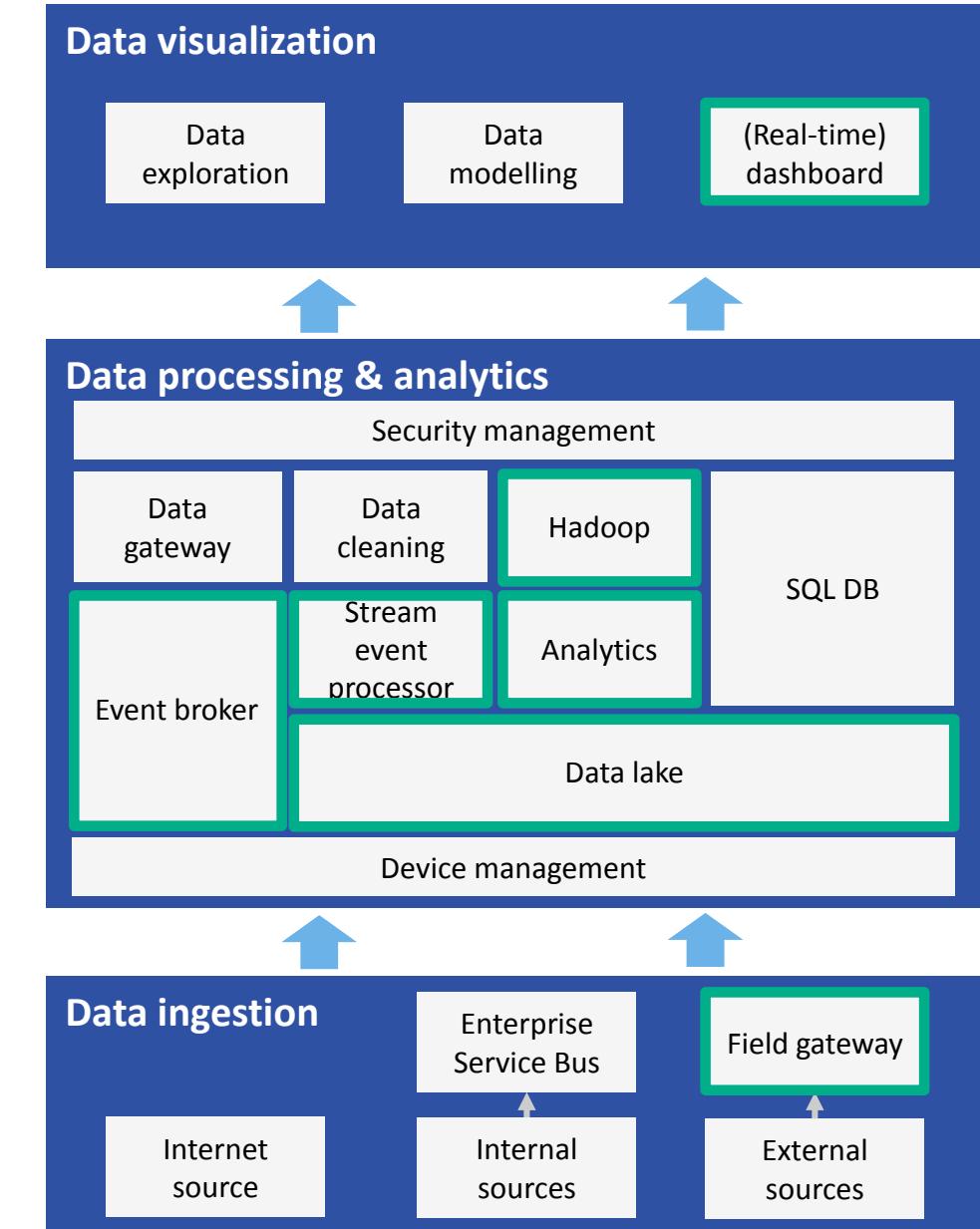
- Area of data mining which examines data or content to answer questions „What is going to happen?“ or „What is likely to happen?“
- Analyse current and historical facts to predict future trends or unknown events

Methods

- Machine learning
- Neural networks
- Data/Text mining
- Internet of Things

Technology portfolio

- Microsoft Azure services
- Microsoft Power BI

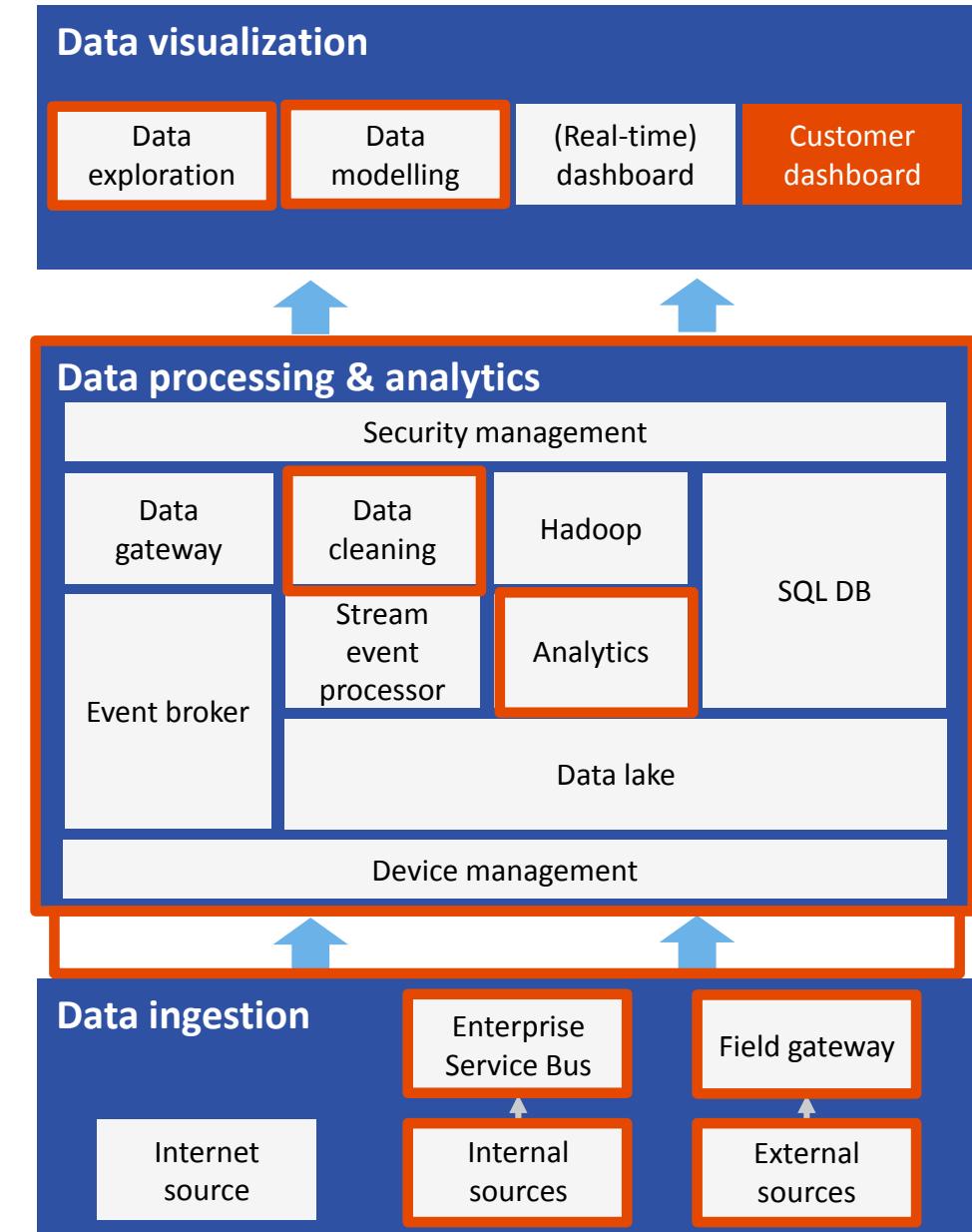


BA@Krones: Outlook – Predictive Analytics

- Data visualization**
 - Project “Self Service Analytics Platform”
 - Project “KR 886 PoC Predictive Analytics”

- Data processing & analytics**
 - Analysis of unstructured data
 - Text Mining
 - Time series analysis
 - Evaluate and implement IoT platform

- Data ingestion**
 - Ingest data from logfiles (MDS)
 - Ingest live data from Krones customer
 - Ingest data from Krones internal sources



What is the participants' task?

- Participants of this training will fulfill the requirements to become a Power User
- **Please note:** Actual tasks of your daily work need to be agreed upon with your manager

Gather
requirements

Build reports

Support
users

Field-related
expertise

Trained in the
handling of
visualization tools

BI&A
knowhow



Task

Competency

Choose the types of graphs that would best fit to the data challenge.



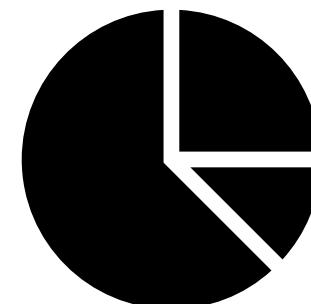
Exercise

Which of the following graphs would you use to visualize the data?

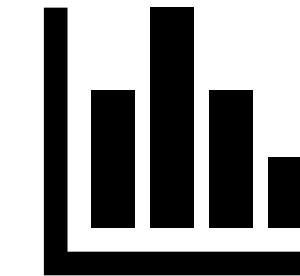
- Marketing & Promotion expenses in million € for each quarter of a year
- Inventory stock level on a daily basis over the last 365 days
- Percentage of products sold per category per region
- Market share in %
- Names of responsible contact persons for BI-Cubes



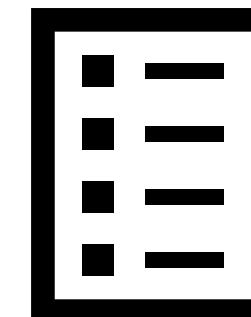
Line graph



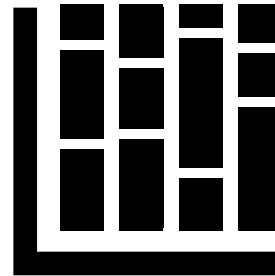
Pie chart



Bar graph



List / table



Stacked bar graph

More info: <http://blog.visme.co/types-of-graphs/>

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Introduction

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Day 2

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Fundamentals

- Use Cases BI & BA
- Architecture BI
- Architecture BA
- Roles and Processes



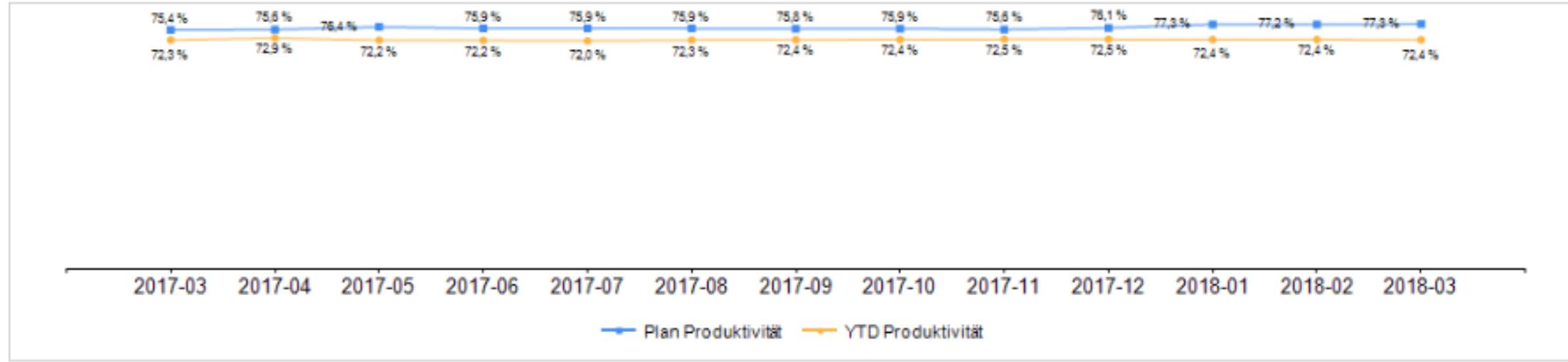
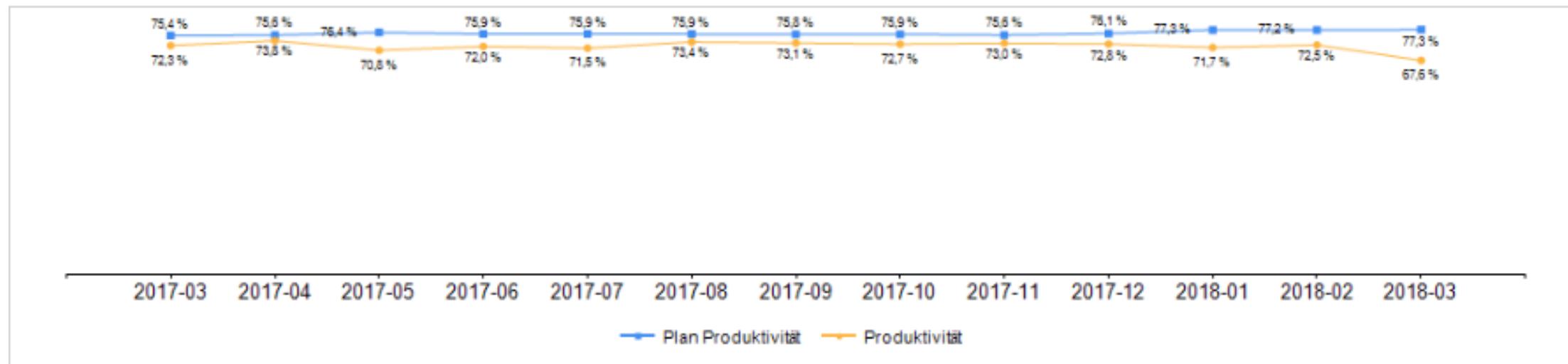
Use case BI: Productivity Plan vs Actual [Controlling]



Produktivität

PLAN-Stunden exkl. Rüsten

Kostenstellen der Produktion



Use case BI: Service Desk User Satisfaction [Information Management]



Service Desk: Survey User Satisfaction

Survey User Satisfaction for Incidents and Service Requests



Evaluation Overview: Average Scores

| Object | Position | Corresponding Object closed in | 2017-08 | | | | | | 2017-09 | 2017-10 | 2017-11 | 2017-12 | 2018-01 | 2018-02 | Total |
|------------|----------|--|------------------|---------------|------------------|---------------|------------------|---------------|---------|---------|---------|---------|---------|---------|-------|
| | | | Franklin | Indien | Neutraubling | Total | Total | Total | | | | | | | |
| Incident | 1 | Wie bewerten Sie die Bearbeitung Ihres Tickets insgesamt? / How satisfied are you with the handling of your ticket overall? | Received Replies | Average Value | Received Replies | Average Value | Received Replies | Average Value | | | | | | | |
| | 2 | Wie zufrieden sind Sie mit der Lösung Ihres Tickets? / How satisfied are you with the resolution of your ticket? | Received Replies | Average Value | Received Replies | Average Value | Received Replies | Average Value | 21 | 4,5 | 4,5 | 4,2 | 4,4 | 4,0 | 4,4 |
| | 3 | Wie zufrieden sind Sie mit der Bearbeitungsdauer Ihres Tickets? / How satisfied are you with the length of time the handling of your ticket took? | Received Replies | Average Value | Received Replies | Average Value | Received Replies | Average Value | 21 | 4,0 | 4,0 | 4,2 | 4,6 | 4,2 | 4,5 |
| | 4 | Wie zufrieden sind Sie mit der Freundlichkeit ihrer Ansprechpartner? / How satisfied are you with the professionalism of the contact person dealing with the matter? | Received Replies | Average Value | Received Replies | Average Value | Received Replies | Average Value | 21 | 4,7 | 4,7 | 4,6 | 4,5 | 4,5 | 4,5 |
| ServiceReq | 1 | Wie bewerten Sie die Bearbeitung Ihres Tickets insgesamt? / How satisfied are you with the handling of your ticket overall? | Received Replies | Average Value | Received Replies | Average Value | Received Replies | Average Value | | | | | | | |
| | 2 | Wie zufrieden sind Sie mit der Lösung Ihres Tickets? / How satisfied are you with the resolution of your ticket? | Received Replies | Average Value | Received Replies | Average Value | Received Replies | Average Value | 4 | 4,8 | 6 | 3,8 | 95 | 4,3 | 4,3 |
| | 3 | Wie zufrieden sind Sie mit der Bearbeitungsdauer Ihres Tickets? / How satisfied are you with the length of time the handling of your ticket took? | Received Replies | Average Value | Received Replies | Average Value | Received Replies | Average Value | 4 | 4,5 | 6 | 4,0 | 95 | 4,4 | 4,4 |
| | 4 | Wie zufrieden sind Sie mit der Freundlichkeit ihrer Ansprechpartner? / How satisfied are you with the professionalism of the contact person dealing with the matter? | Received Replies | Average Value | Received Replies | Average Value | Received Replies | Average Value | 4 | 5,0 | 6 | 3,8 | 95 | 4,5 | 4,5 |

Use case BI: Supplier Overview [Quality Assurance]



Lieferantenüberblick

Übersicht aller Lieferantenbewertungskriterien

für den Zeitraum von : 2017 bis 2018

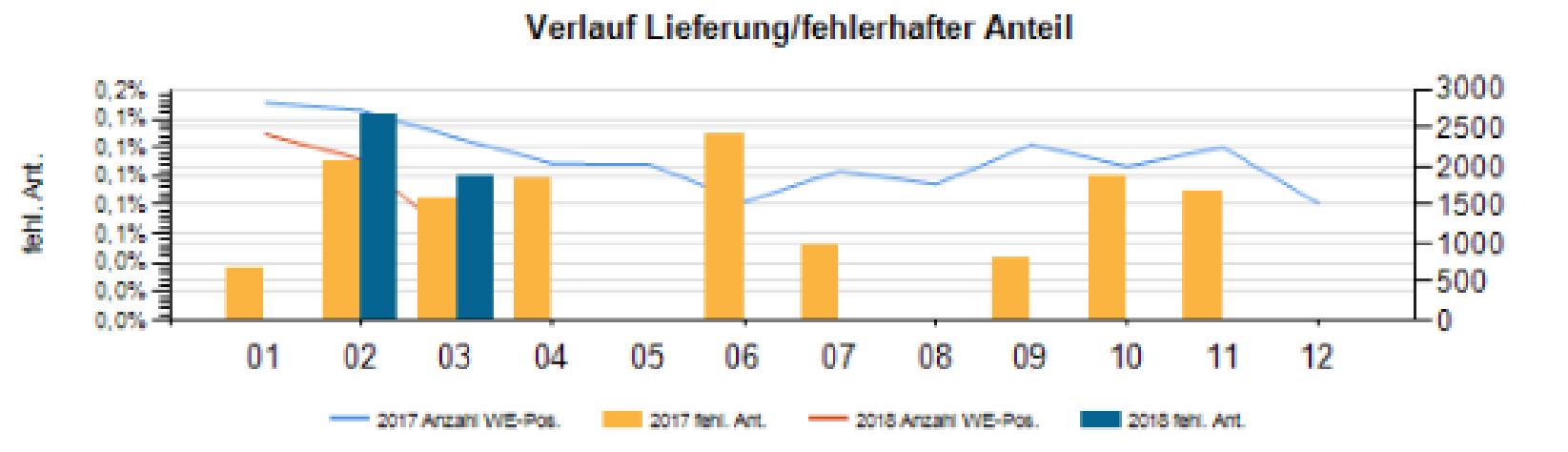
0000630289 Regensburger Werkstätten Gemeinnützige GmbH



Qualitätssicherungsvereinbarung mit Kanbanabwicklung

| Jahr | Anzahl WE-Pos. | Anzahl F2 | fehl.Ant. |
|------|----------------|-----------|-----------|
| 2017 | 25.335 | 16 | 0,06% |
| 2018 | 5.525 | 4 | 0,07% |

| 2018-03 | aktuelle QKZ. | Trend. |
|------------|---------------|--------|
| Gesamtnote | 97 | ↑ |
| Qualität | 100 | ↔ |
| Lieferung | 91 | ↑ |



| Jahr | | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 |
|------|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 2017 | WE-Pos. | 2.826 | 2.733 | 2.375 | 2.042 | 2.036 | 1.543 | 1.943 | 1.770 | 2.288 | 2.006 | 2.253 | 1.520 |
| | Anz. F2 | 1 | 3 | 2 | 2 | 0 | 2 | 1 | 0 | 1 | 2 | 2 | 0 |
| | fehl.Ant. | 0,04% | 0,11% | 0,08% | 0,10% | 0,00% | 0,13% | 0,05% | 0,00% | 0,04% | 0,10% | 0,09% | 0,00% |
| 2018 | WE-Pos. | 2.423 | 2.094 | 1.008 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Anz. F2 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | fehl.Ant. | 0,00% | 0,14% | 0,10% | 0,00% | 0,00% | 0,00% | 0,00% | 0,00% | 0,00% | 0,00% | 0,00% | 0,00% |



Use case BI: Sales Documents Tracking [Sales]



KRONES AG - IO_Ship-to party_Document_daily

Period: 2/12/2018 - 2/16/2018

Sum of value chain: Krones AG machines, Krones AG change parts, Krones AG services, Krones AG spare parts, Unknown



| Date | Ship-to-party | Sales region | Country | Document nbr | Net | Net Intake | Net change | Net |
|--------------|--|-----------------------|--------------|--------------|---------------------|---------------|---------------|-------------------------|
| | | | | | Addition in TEUR | in TEUR | in TEUR | Cancellation in TEUR |
| Total | | | | | 60,641 | 14,730 | 49,410 | - 3,499 |
| ✉ 2/16/2018 | | | | | 11,035 | 2,363 | 8,833 | - 161 |
| ✉ 2/15/2018 | | | | | 20,446 | 3,252 | 17,755 | - 561 |
| ✉ 2/14/2018 | | | | | 7,659 | 3,286 | 4,516 | - 144 |
| | Pirate Life Brewing | Asia/Pacific | Australia | 7027815 | 1,846 | | 1,846 | |
| | PRODUCTORA LA FLORIDA SA CED. JURIDICA | North/Central America | Costa Rica | 7027138 | 651 | 651 | | |
| | KROMBACHER BRAUEREI BERNHARD SCHADEBERG | Central Europe | Germany | 44187820 | 440 | | 440 | |
| | Vipoll d.o.o. | Eastern Europe/GUS | Slovenia | 7027861 | 364 | | 364 | |
| | MOTTS LLP | North/Central America | USA | 7027606 | 274 | | 274 | |
| | MOTTS LLP | North/Central America | USA | 7027607 | 229 | | 229 | |
| | PRODUCTOS CAPILARES L'OREAL S.A.U. | Western Europe | Spain | 7027869 | 186 | | 186 | |
| | STANIC BEVERAGES doo | Eastern Europe/GUS | Bosnia-Herz. | 7027160 | 169 | 169 | | |
| | VITAQUA GmbH | Central Europe | Germany | 5078056 | 154 | 154 | | |
| | Krones (Thailand) Co Ltd 0 10 5 540 0156 | Asia/Pacific | Thailand | 52327152 | 141 | 141 | | |
| | THE SOUTH AFRICAN BREWERIES LIMITED CHAM | Middle East/Africa | South Africa | 44187502 | 120 | | 120 | |
| | THE SOUTH AFRICAN BREWERIES LIMITED ALRO | Middle East/Africa | South Africa | 7027828 | 120 | | 120 | |
| | THE SOUTH AFRICAN BREWERIES LIMITED NEWL | Middle East/Africa | South Africa | 7027829 | 120 | | 120 | |



Use Case BA: PoC Data Analysis Distribution Channel 01 [slide 1/2]



Existing situation

- Quotation process takes 2 – 5 days
- Required features of customer objects are extensive
 - E.g. combination of filler and labeler require 58 specified features for a detailed offer
 - Customers often cannot specify these initially
- Change of features triggers another iteration of the quotation process
- Reference price range is inflexible

Target situation

- KRONES internal interactive tool for prompt reference pricing
- Verify importance of customer object features regarding pricing
 - Target: +/-10% pricing with as few features as needed
 - Creation of “robust fictive offer”
 - Reduction of customer object features
- Acceleration of quotation process
- Improved customer service and flexibility

Results

- Identification of customer object features and decoration information
- Prediction of offer positions (type of machine, machine variant, price)
- Multiple decision trees



► Reduced throughput times, lower costs and improve quality



Use Case BA: PoC Data Analysis Distribution Channel 01 [slide 2/2]

- **Input Data**

Cust. object features
91,599 distinct
16,121,267 total

Decorations
103,540 distinct
3,201,835 total

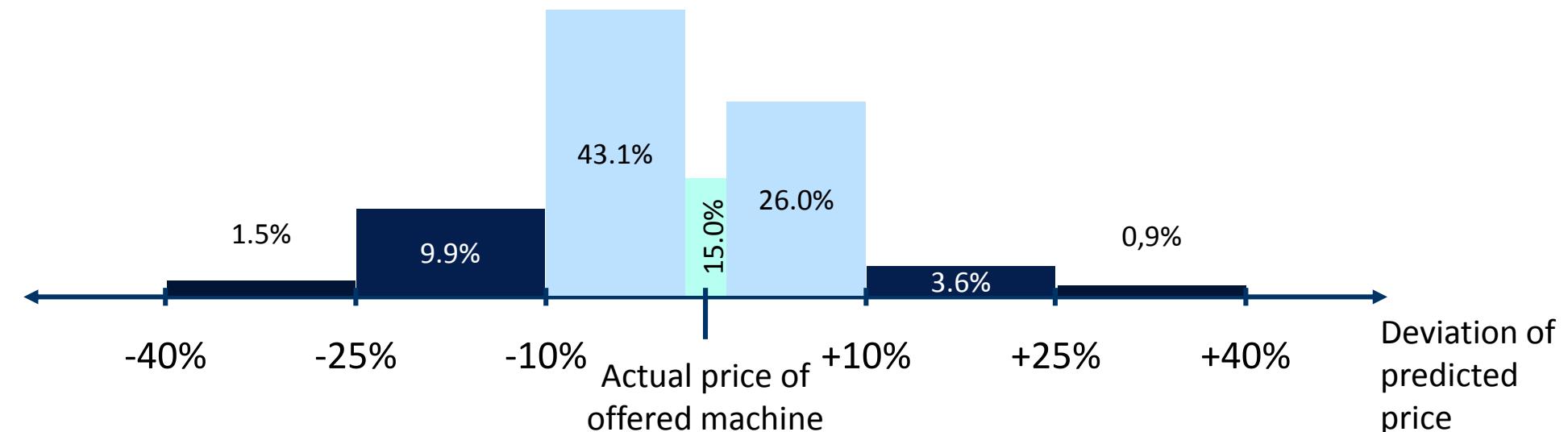
Offer pos. for machines
49,094 offer positions
1,854 offer positions (Labellers)

Machine variants / prices
22,846 distinct
7,941,456 total

- **Prediction of machine type and number**

| | Type and number of machine | Type, number and model of machine |
|------------------------|----------------------------------|-----------------------------------|
| Labellers | 93,5% correctly predicted | 84,0% correctly predicted |
| Blow-molding m. | 93,8% correctly predicted | 87,5% correctly predicted |
| Fillers | 94,5% correctly predicted | 88,4% correctly predicted |

- **Prediction of prices (e. g. CONTIROLL 745)**



Use Case BA: Internet of Things predictive analytics



Existing situation

- Industry 4.0 at Krones
- Previous projects with scope “Predictive Maintenance”
- Data collection at Krones customer on a filling machine
- Data available in Azure cloud

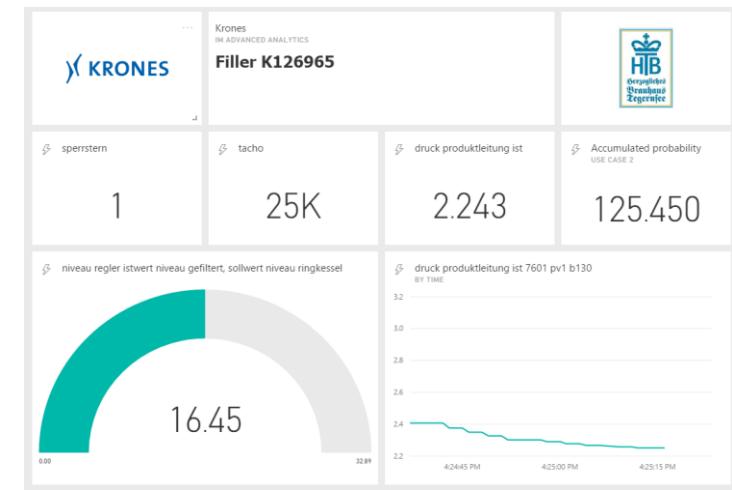
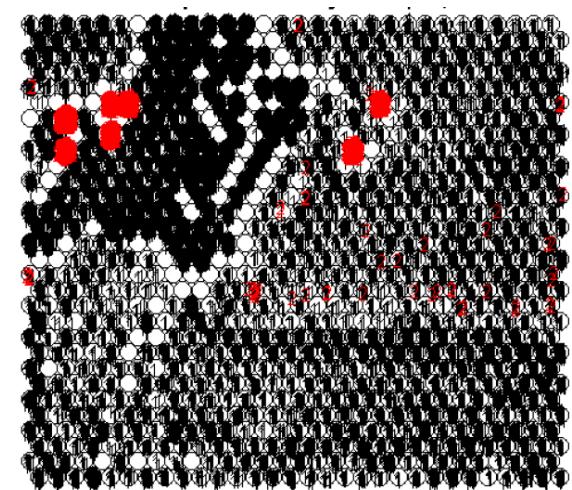


Results

- Detection of normal behavior and misbehavior
- Automatic detection of responsible sensors
- Correlations of sensors and misbehavior
- Predictive alarming of one use case
- Prototype with Microsoft Azure components

Target situation

- Proof of Predictive Analytics based on predefined use cases
- Machine learning algorithm(s)
 - Anomaly detection
 - Detection of normal behavior and misconduct
 - (Un)supervised learning
 - Predictive Analytics
- Show time range and probability of the malfunction occurrence
- Early warning/recognition before the predefined failure



Predict machine failures based on raw data of machine

Assign situational use cases to
Business Intelligence or
Business Analytics.



Assign situational use cases to Business Intelligence or Business Analytics

Use Case A:

The CO department is working on gathering all relevant data to calculate key figures for the annual investors' report. The data is scattered across a variety of databases and files and it takes effort to filter what's relevant. The head of CO is looking for a quicker and more reliable solution that collects the data in a centralized platform and offers continuous reporting. Which system is fulfilling the requirements efficiently?



Use Case B:

Predictive Maintenance enables companies to recognize possible machine failures before they even occur. For this, sensors must collect and stream data. The data will then get analyzed for patterns that indicate failure and work sequences must be initiated accordingly.

Which platform is suited better for this use case?



Business Intelligence



Business Analytics

Assign situational use cases to Business Intelligence or Business Analytics

Use Case C:

KRONES's annual report shows the gender ratio for all employees of the company. This is an external view of the company however and the HR department wants to analyze the percentage of female workers for each department. Additionally they request to display the ratios for each display area in a pie chart that uses the most current data.
Should the analysis be implemented in the BI or the BA system?



Use Case D:

The IT department is close to introducing a new ticketing system. The old system will thus be redundant and won't be used anymore. The head of IT has decided that the old system should be shut down, but the historical information must be kept in an archive. IT employees expect to query the archive occasionally when they are looking for solutions in old tickets.

What system is a better fit to store the historical data?



Business Intelligence



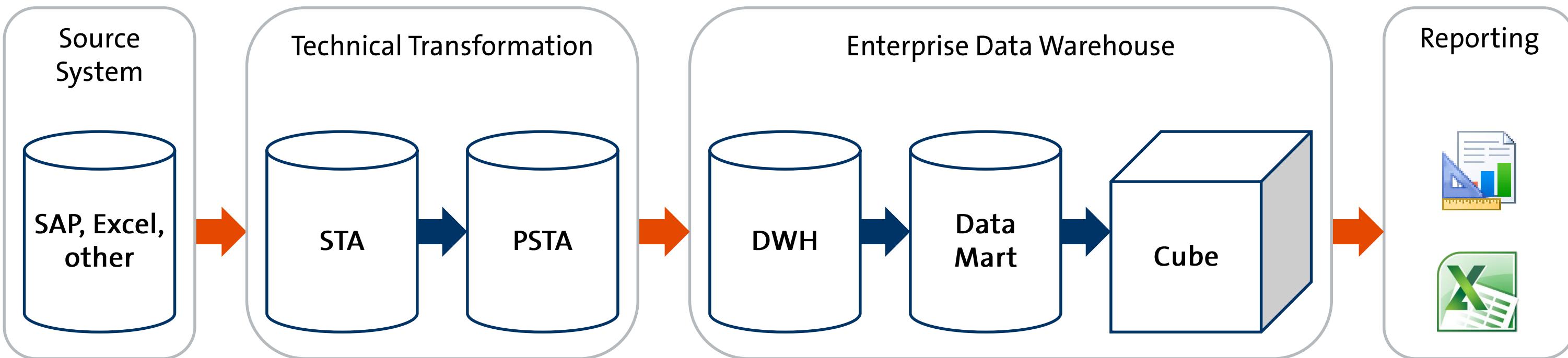
Business Analytics

Fundamentals

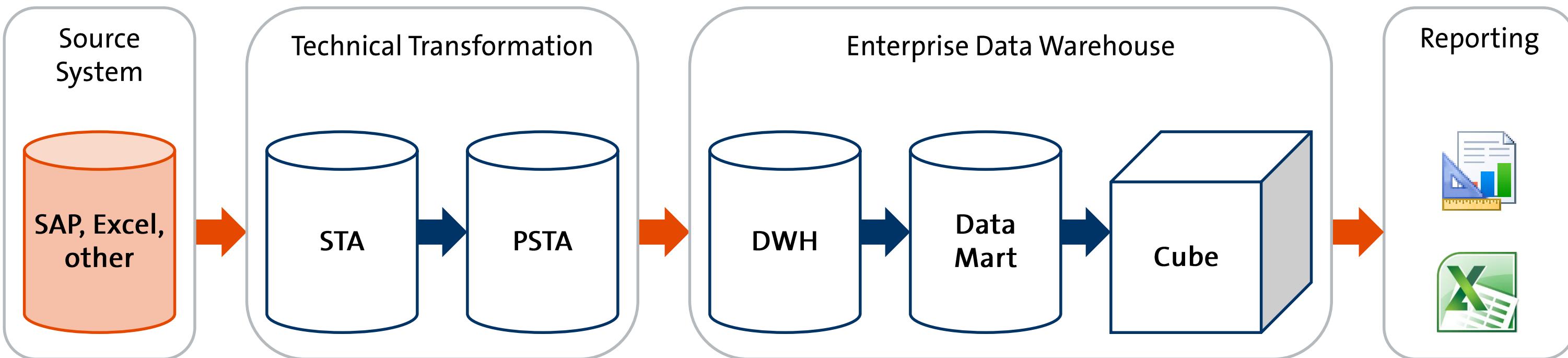
- Use Cases BI & BA
- **Architecture BI**
- Architecture BA
- Roles and Processes



Krones' BI architecture has four main layers

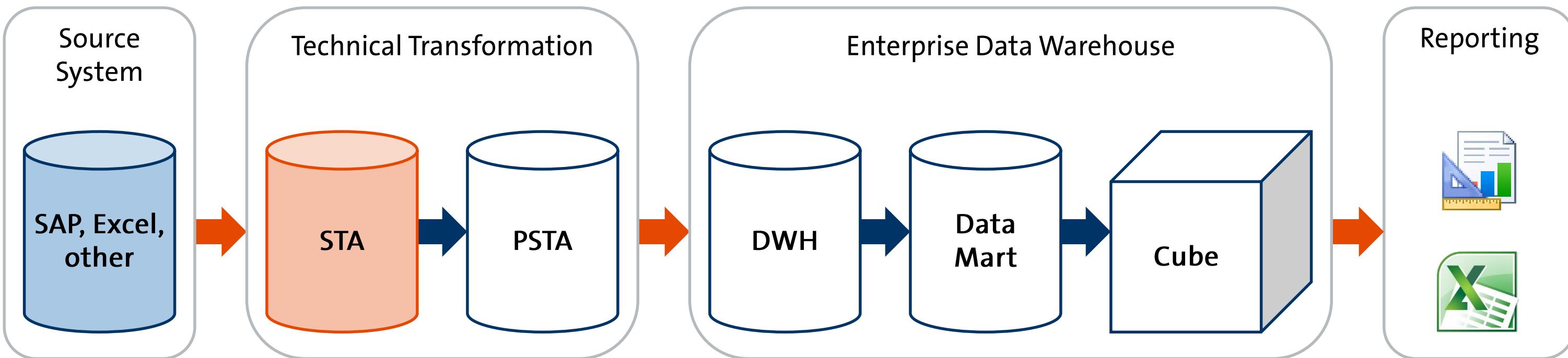


1st layer: Source Systems



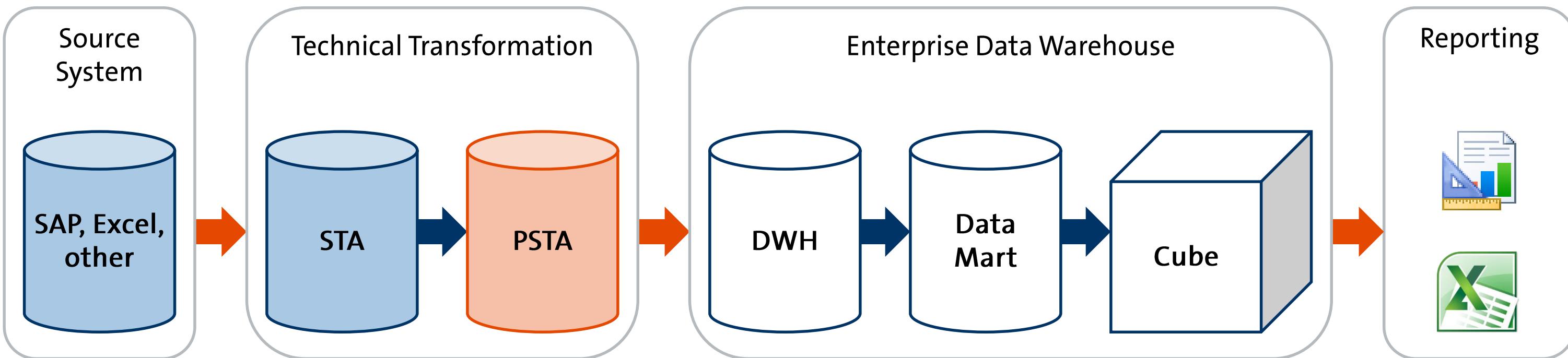
- The source systems provide raw data
- Most of the data is being extracted from SAP, however there are also Excel sheets and outdated database systems

2nd layer: Technical Transformation, Staging Area



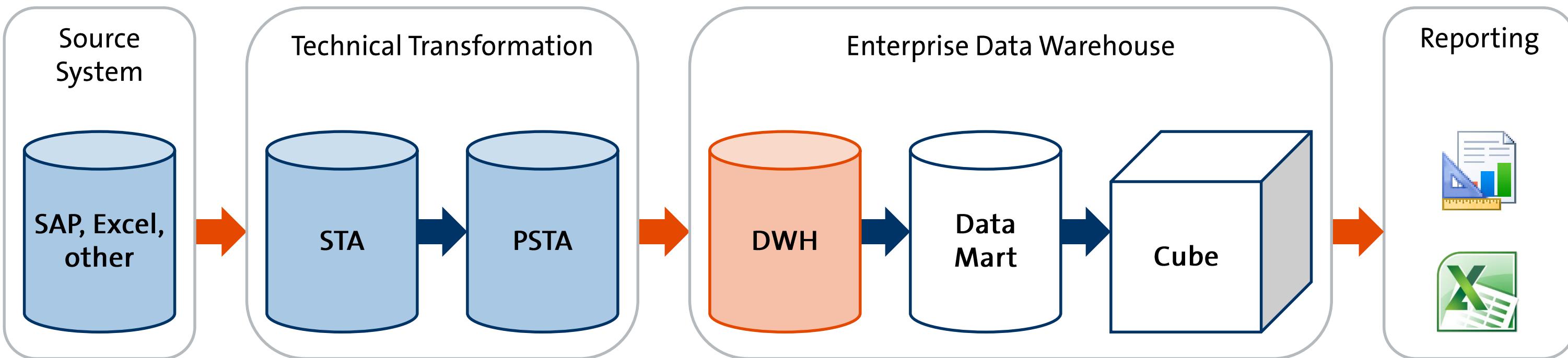
- The raw data is then getting loaded into the **staging area**
- This step assures all data types are set correctly for the Microsoft environment
- The data is either extracted in full (text tables, small tables) or delta (data that has changed / been added since the last run)
- The data is now independent from the source systems
- Table name convention: [scheme].[table name] e.g.: MM.MARA, SD.VBAP

2nd layer: Technical Transformation, Persistent Staging Area



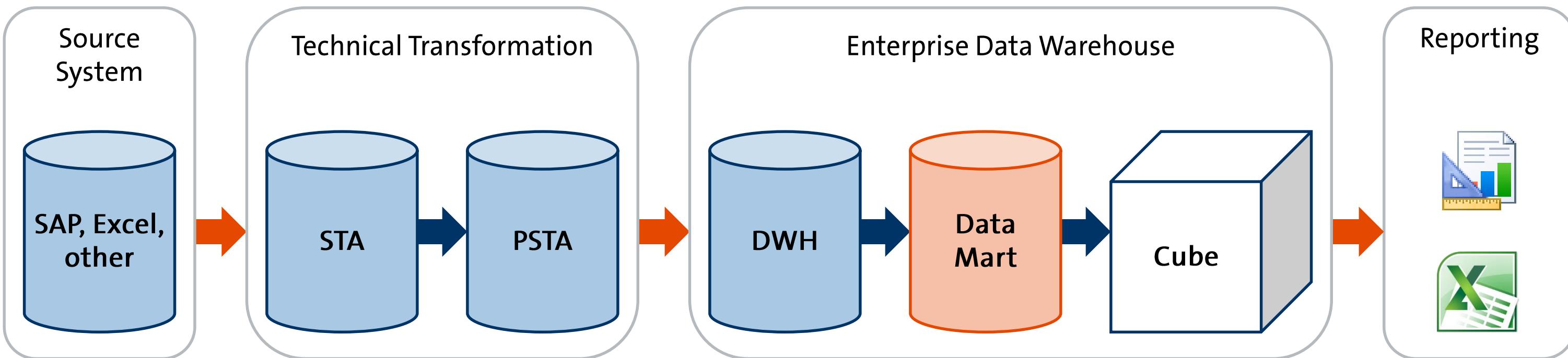
- All the data from the STA tables is being extracted
- The data is being transformed (handling NULL values, data cleansing) and loaded into the **persistent staging area**
- The STA tables are then being truncated
- The PSTA tables are not being emptied in order to keep a ‘safety stock’ of data in case of emergency
- Table name convention: [scheme].[table name] e.g.: MM.MARA, SD.VBAP

3rd layer: Enterprise Data Warehouse, Data Warehouse



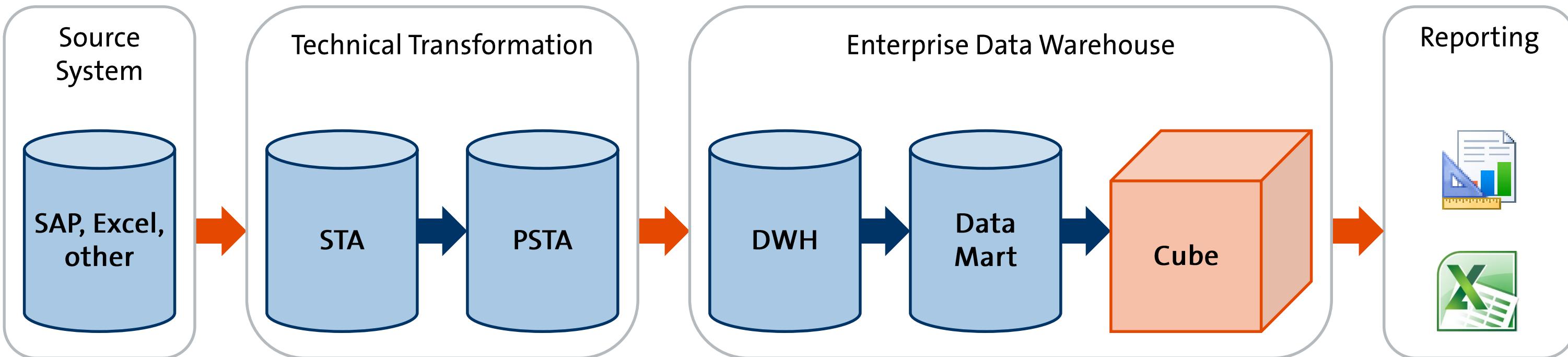
- The required data gets extracted from at least one PSTA table
- The data is being transformed (calculations, added texts, merging data etc.)
- Tables either contain one Primary Key and informational attributes (**Dimension tables**) or
- One Primary Key and many Foreign Keys and Measures / key figures (**Fact table**)
- Table name convention: ['Dim'/'Fact'][artificial table name] e.g.: DimSupplier, FactSalesOrders

3rd layer: Enterprise Data Warehouse, Data Mart



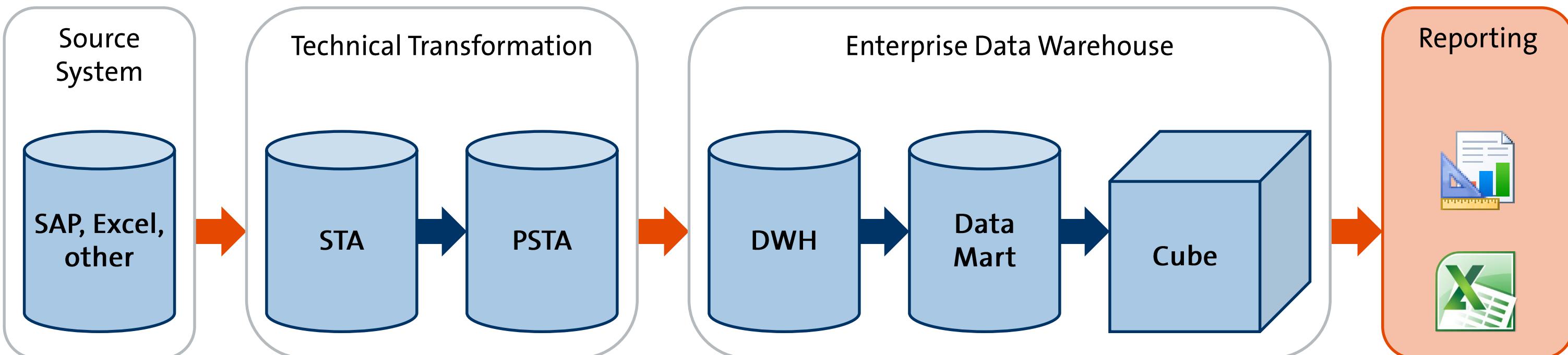
- Data Marts are views on the actual DWH tables
- Data Marts are arranged by strategic departments and contain only relevant data
- Tables in Data Marts do not have to contain all the data from their original tables
- View name convention: ['Dim'/Fact'][artificial table name] e.g.: DimSupplier, FactSalesOrders

3rd layer: Enterprise Data Warehouse, Cubes



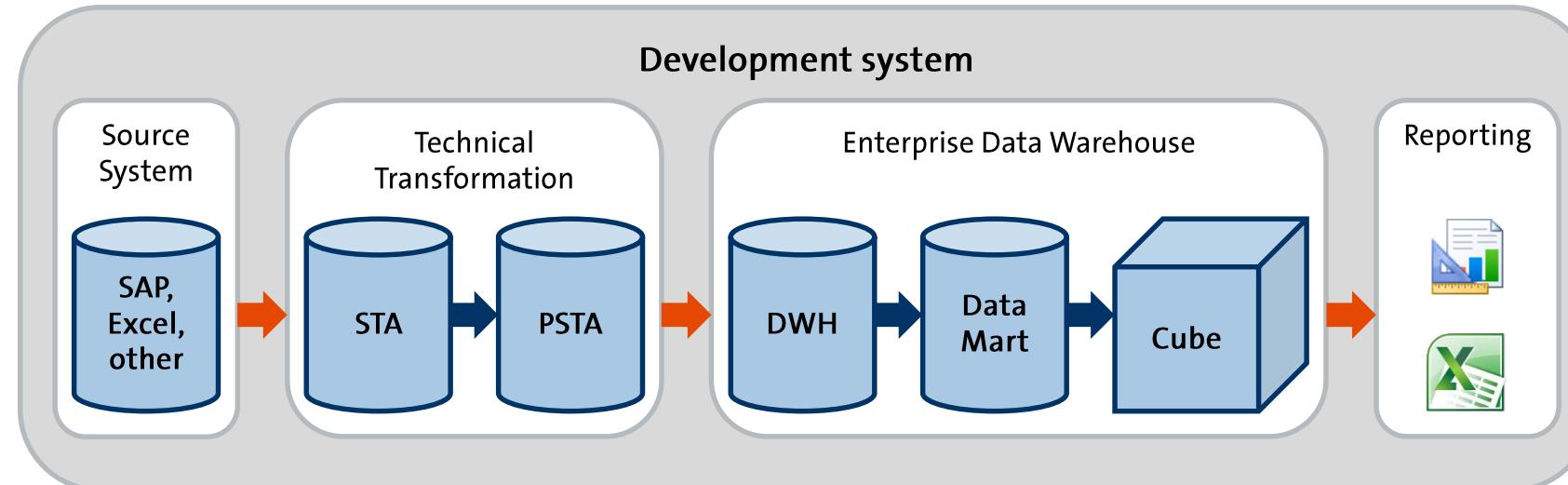
- Cubes target one special field of a department
 - Cubes arrange the tables in a galaxy scheme and provide calculations and aggregations on the measures / key figures
 - Authorizations, translations and formats are also set in cubes
-
- Cube name convention: [artificial table name] e.g.: Suppliers, SalesOrders

4th layer: Reporting

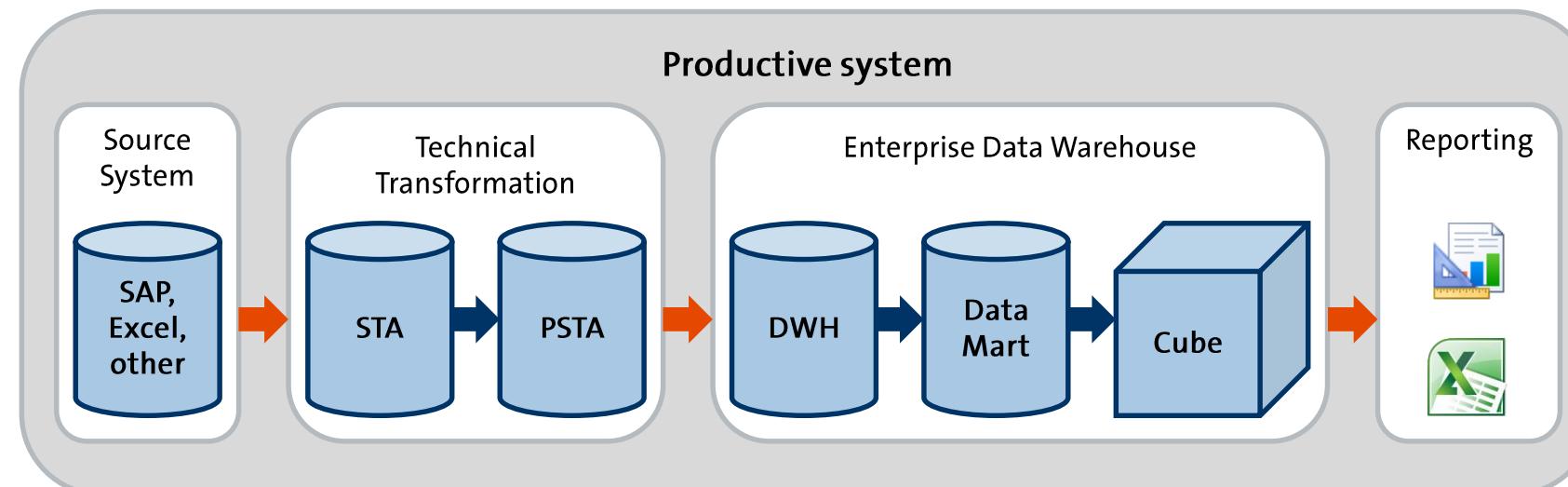


- Reports directly access cube data
- The users who require the reports usually build them themselves
- More information to come at bullet point 'BI Strategy @Krones'
- Report name convention: [artificial table name] e.g.: Analysis of material movements, Daily Sales Region South Africa

There is a development and a productive system that contain different data



- Data gets manually updated weekly / monthly as a copy of the productive system
- Reports are mostly used to try out things, not for actual work
- Used to test ETLs and cube processing

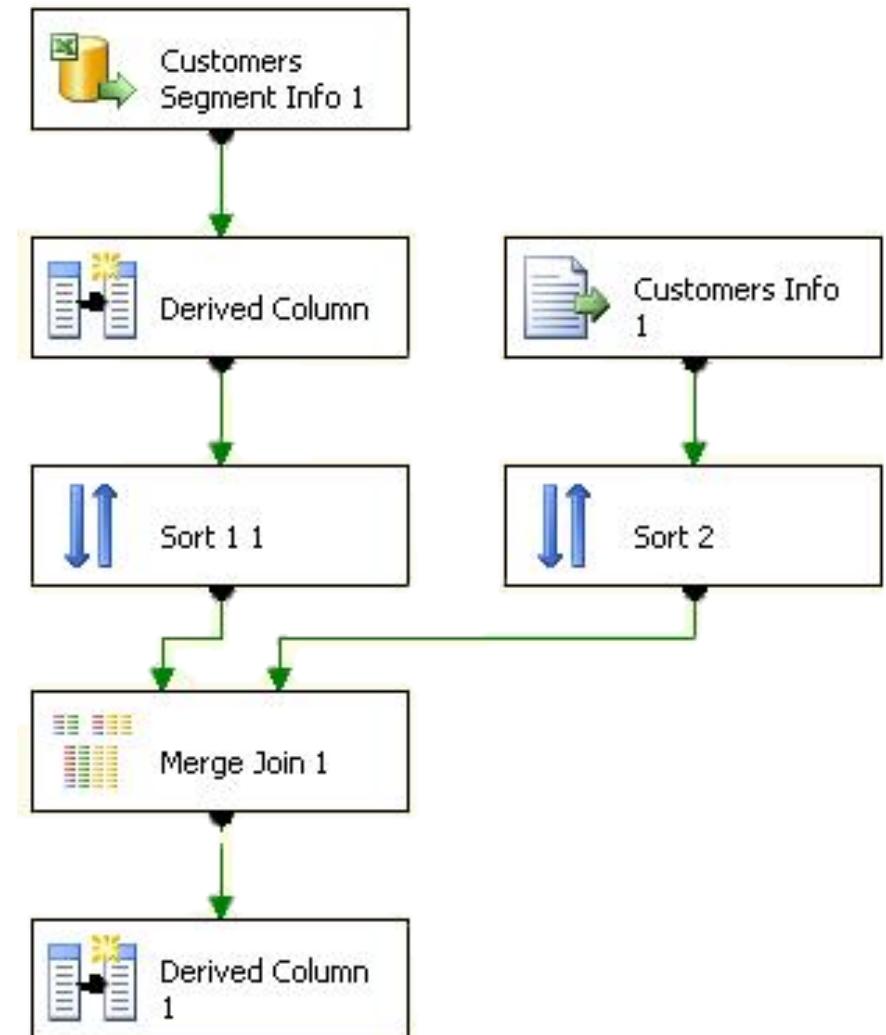


- Data gets automatically updated daily (if required)
- Reports are used for work
- Technical and substantial changes get implemented according to a release plan
- Ad hoc releases are possible but uncommon

ETL paths are responsible for the extraction, transformation and storage of data

READER

- Determines the data flow of a package
- Only used in the STA, PSTA and DWH stages
- Short for **Extract Transform Load**
- Extract
 - SQL query for the required data
 - More than one source tables possible
- Transform
 - Tools used to manipulate data and add columns to the table
 - Add columns, calculate, sort, merge, split...
- Load
 - Used to load data into tables of the current or next layer

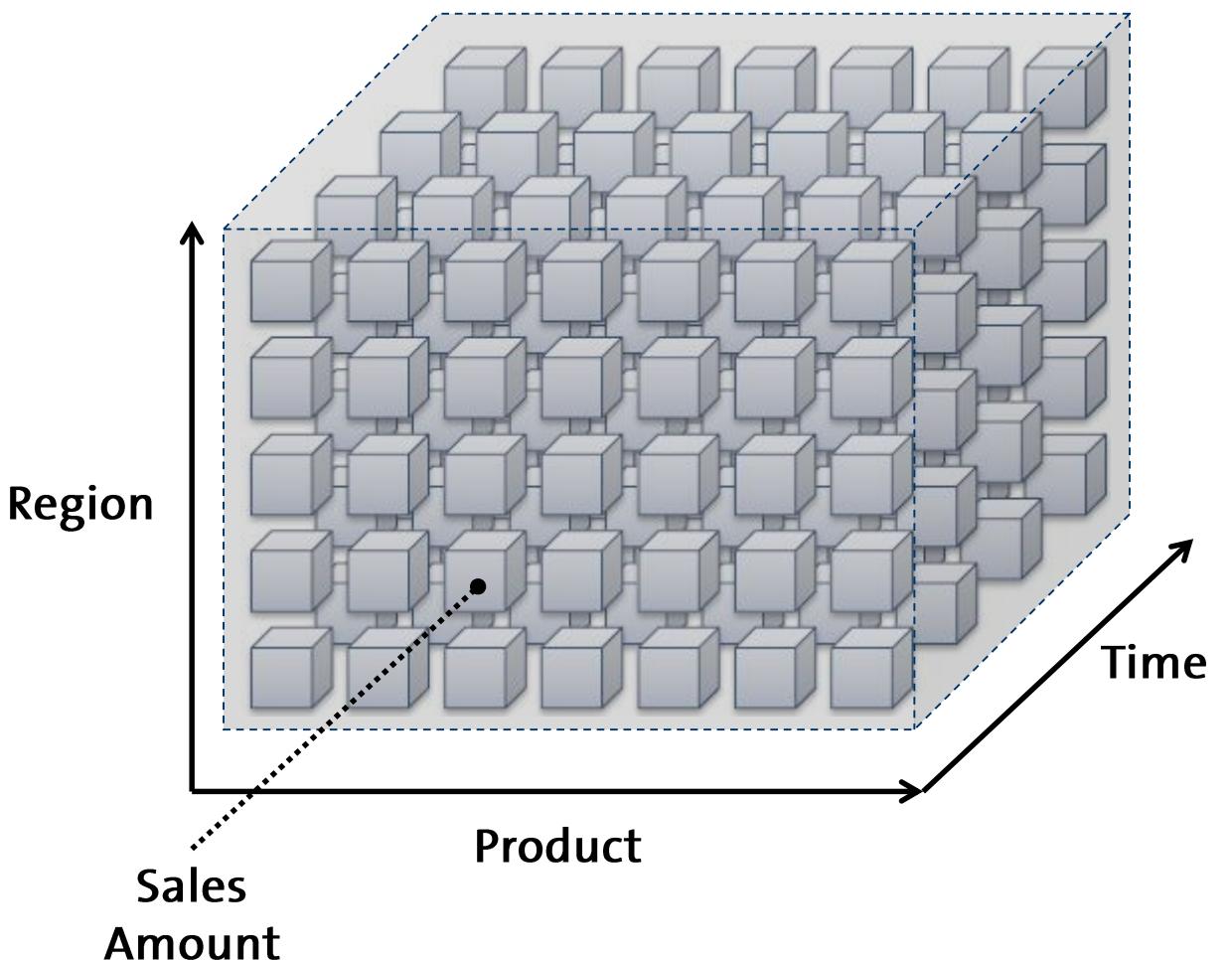


Multidimensional data modelling

- Data model for the support of data analysis
- Basis for Data Warehousing and OLAP (On-Line Analytical Processing) applications
- Analysis of key figures and aggregations from different perspectives
 - Time, geographical, topic related
- Possibility to drill down hierarchical granularity levels
 - Year – Month – Day
 - Category – Sub-Category – Product

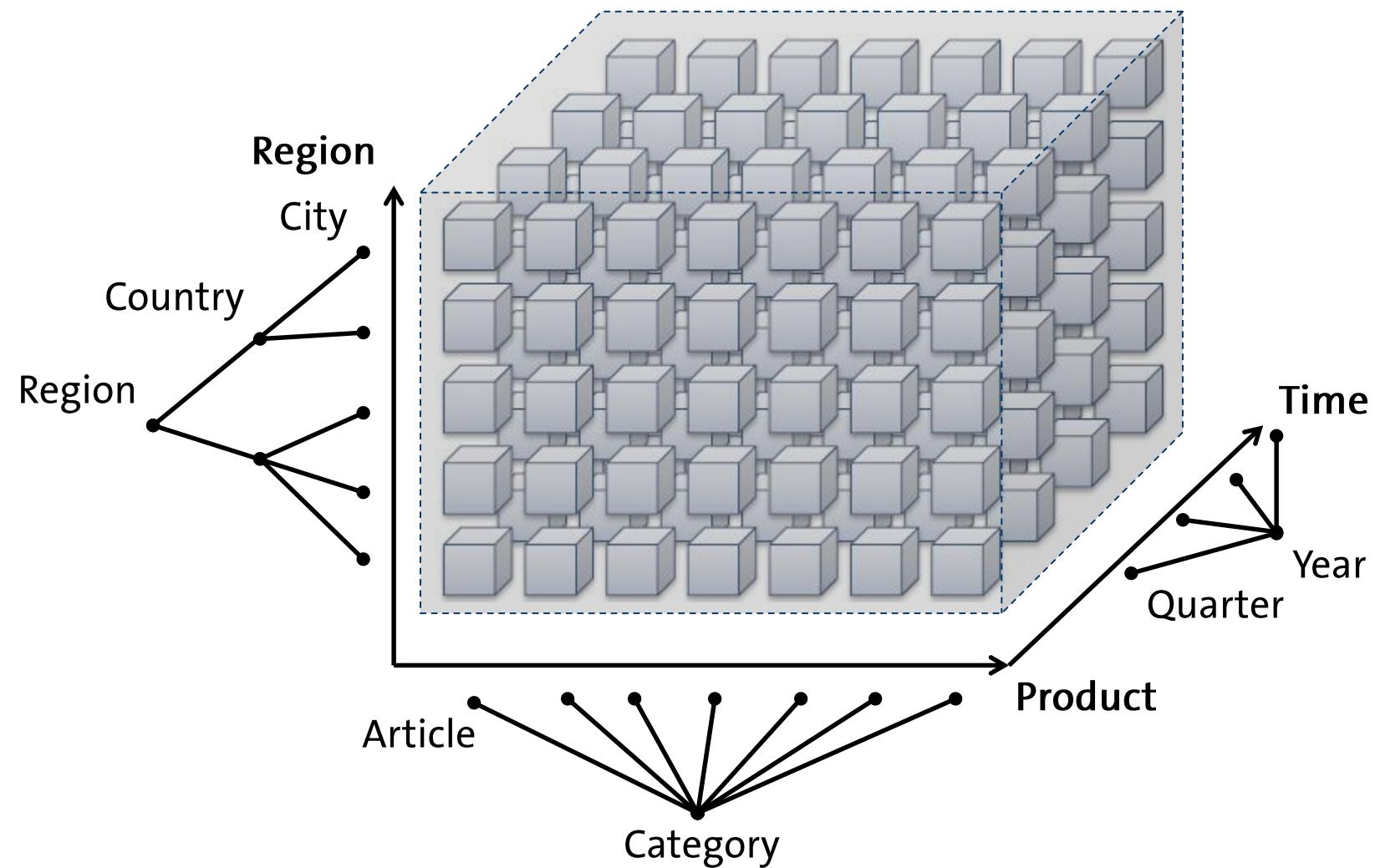
OLAP-Cubes

- Called cube for illustration
- Can have a variety of dimensions
 - 2 dimensions: table
 - 3 dimensions: cube
 - n dimensions: n-dimensional structure
- Cells are fact tables
 - Hold one or more key figures or aggregations
- Edges are dimension tables / attributes



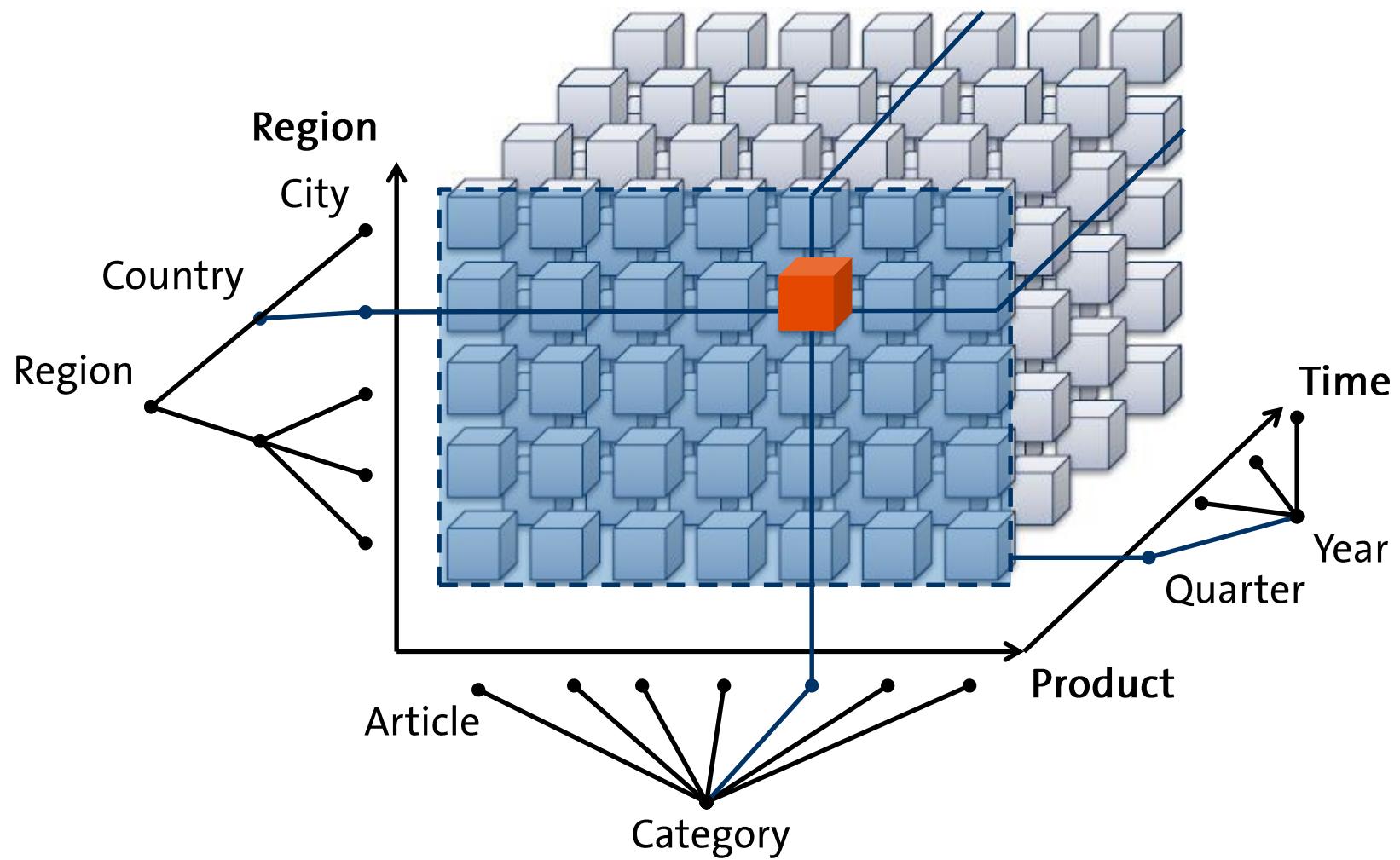
Dimension hierarchies

- Possibility to drill down hierarchical granularity levels
 - Year – Month – Day
 - Category – Sub-Category – Product
- Higher levels include all data from lower levels

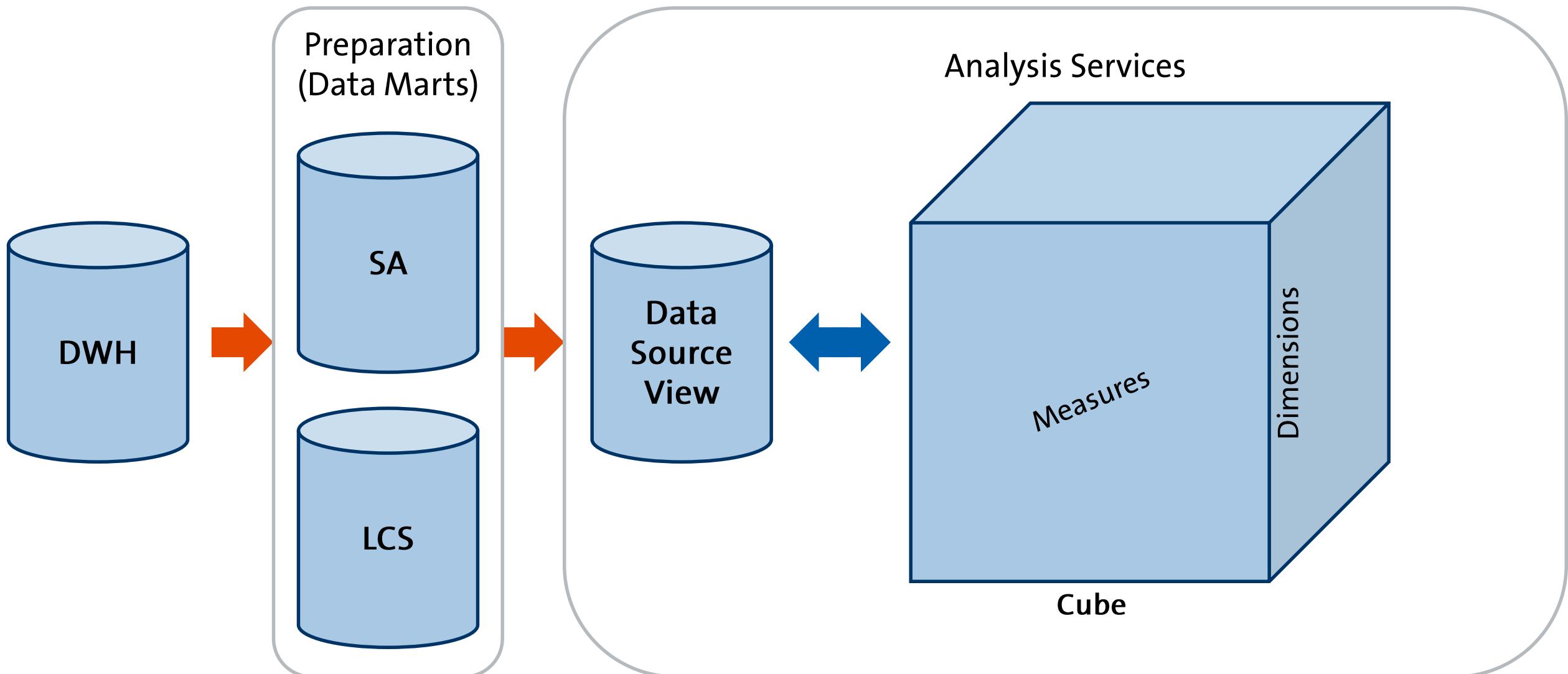


Analyzing cube data

- Filtering for dimension results in the slicing of cubes
- Example
 - Time: Quarter 1
 - City: Tokyo
 - Article: Article E



Components of the Analysis Services



Components of the Analysis Services

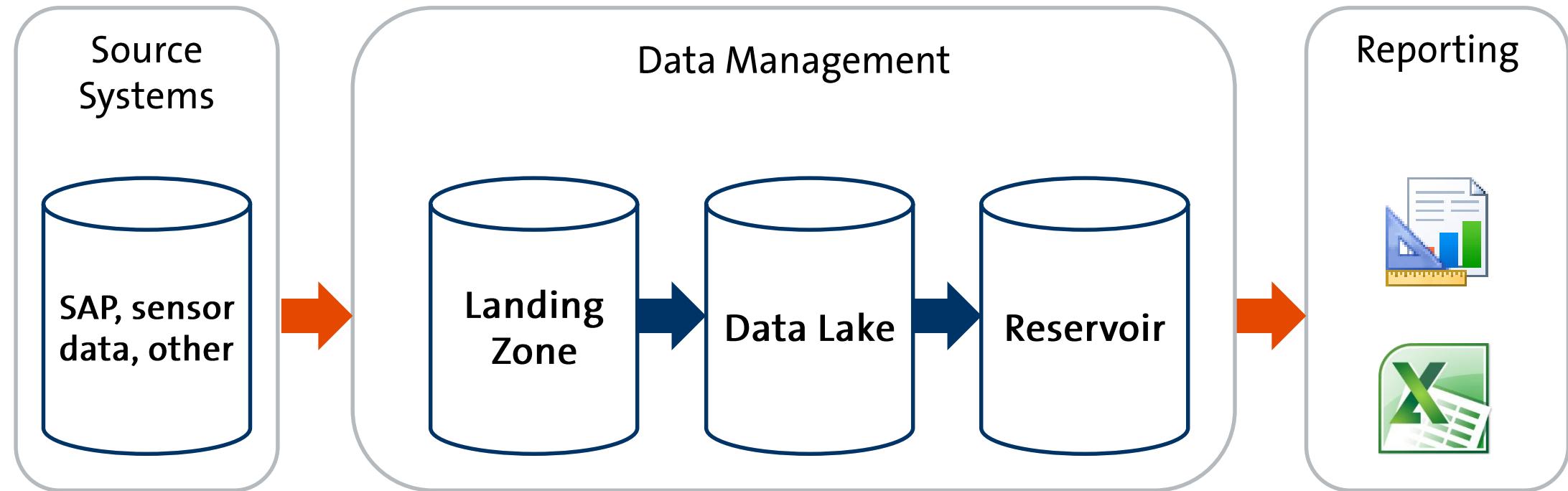
- **Database Dimension**
 - Table with only attributes and a primary key
 - Does not hold measures / key figures
- **Database Attribute**
 - Addresses one or more columns of a dimension table
 - Used for slicing the cube
- **Member**
 - The value of a database attribute
 - E.g.: Attribute: Country; Member: Germany
- **Measure**
 - Value of a fact table (key figure)
 - Used for calculations
- **Measure Dimension**
 - Holds all measures of a cube
 - Members are usually aggregated (Sum, Count, Average)
- **Measure Group**
 - Gathers measures in a ‘folder’
- **Calculated member**
 - Member that is being calculated during the query
 - Defined in MDX statements
- **MDX**
 - Short for Multi Dimensional Expression query language
 - Close to SQL but very advanced
 - Only for multidimensional data

Fundamentals

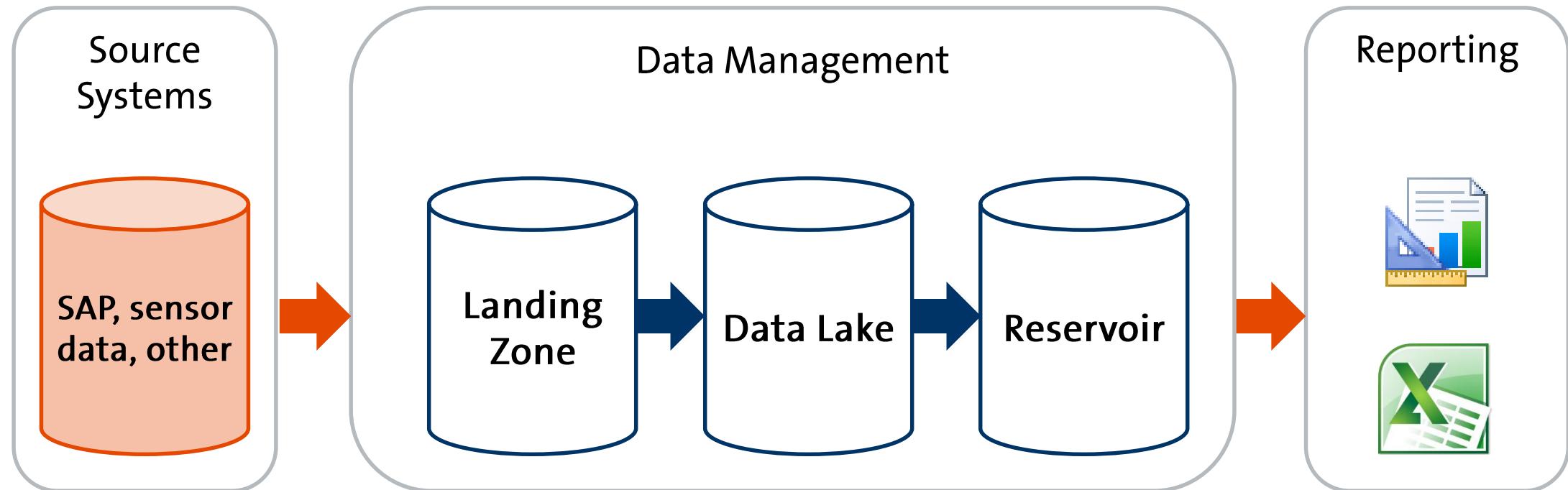
- Use Cases BI & BA
- Architecture BI
- **Architecture BA**
- Roles and Processes



Krones' BA architecture has three main layers

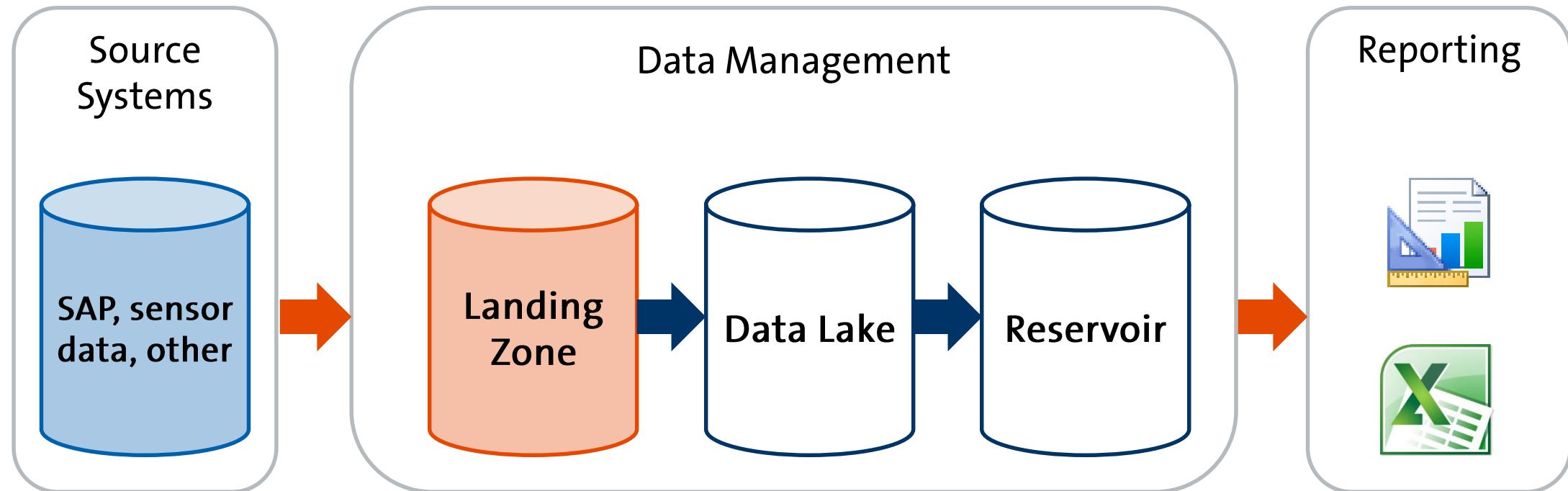


1st layer: Source Systems



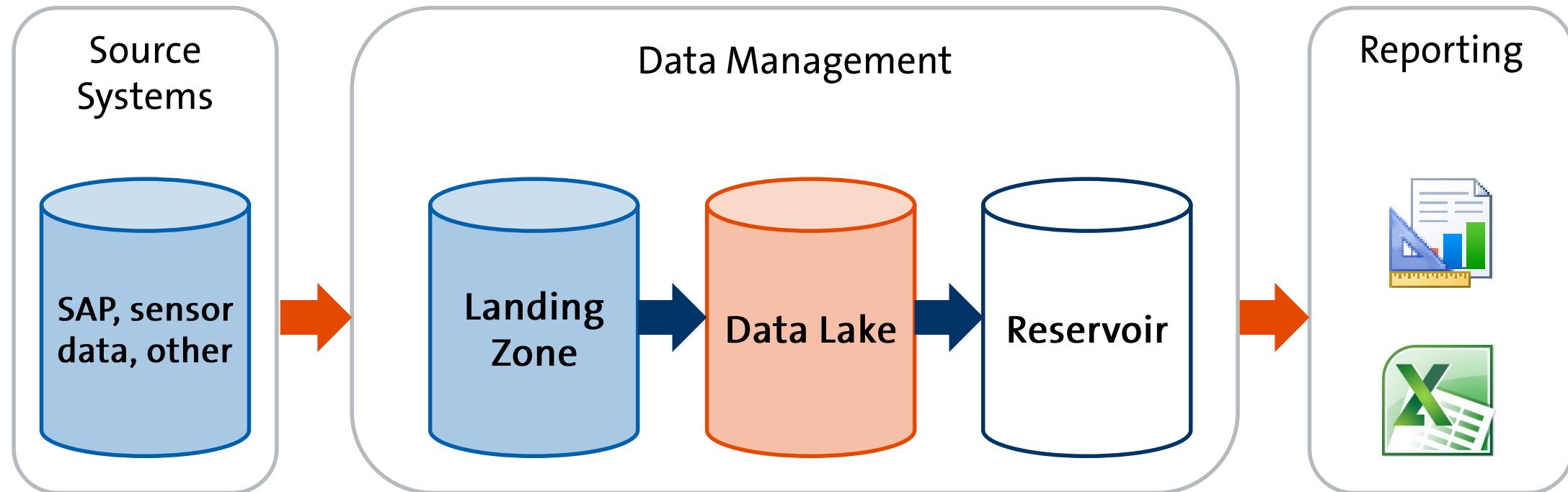
- The source systems provide raw data
- Data sources can be anything:
 - Structured data in SAP, other data bases
 - Semi-structured machine data
 - Images, documents, audio files

2nd layer: Data Management, Landing Zone



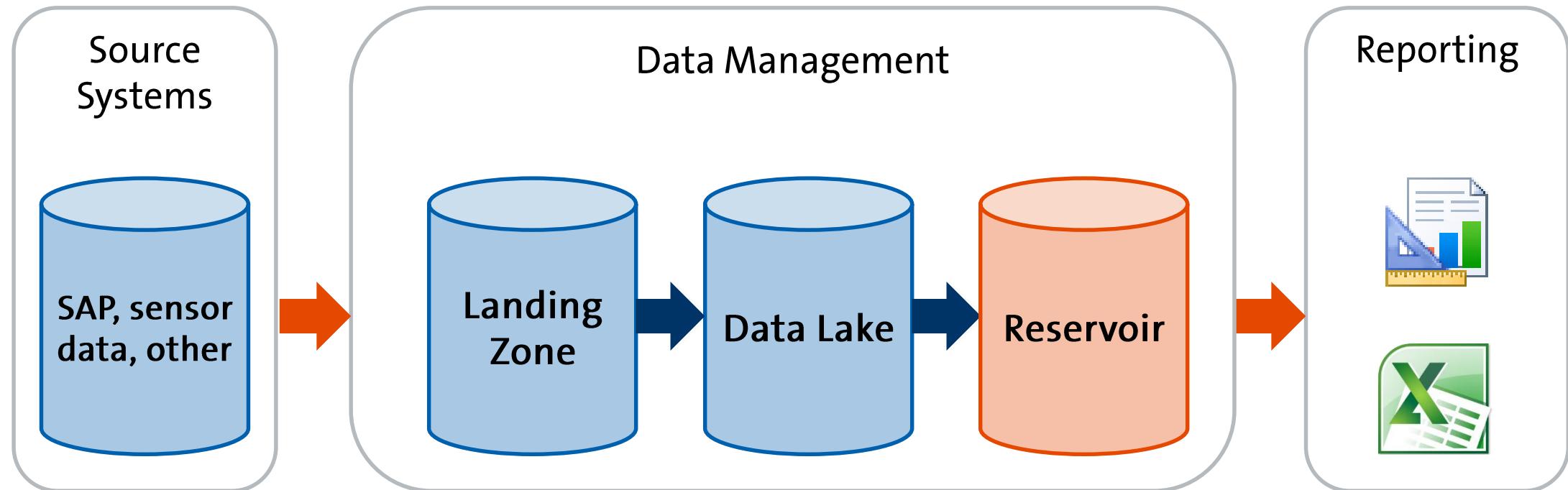
- The raw data is then getting loaded into the landing zone
- Data gets compressed and stored temporarily
- The data is either extracted in full (text tables, small tables) or delta (data that has changed / been added since the last run)
- The data is now independent from the source systems
- Similar to STA in BI system

2nd layer: Data Management, Data Lake



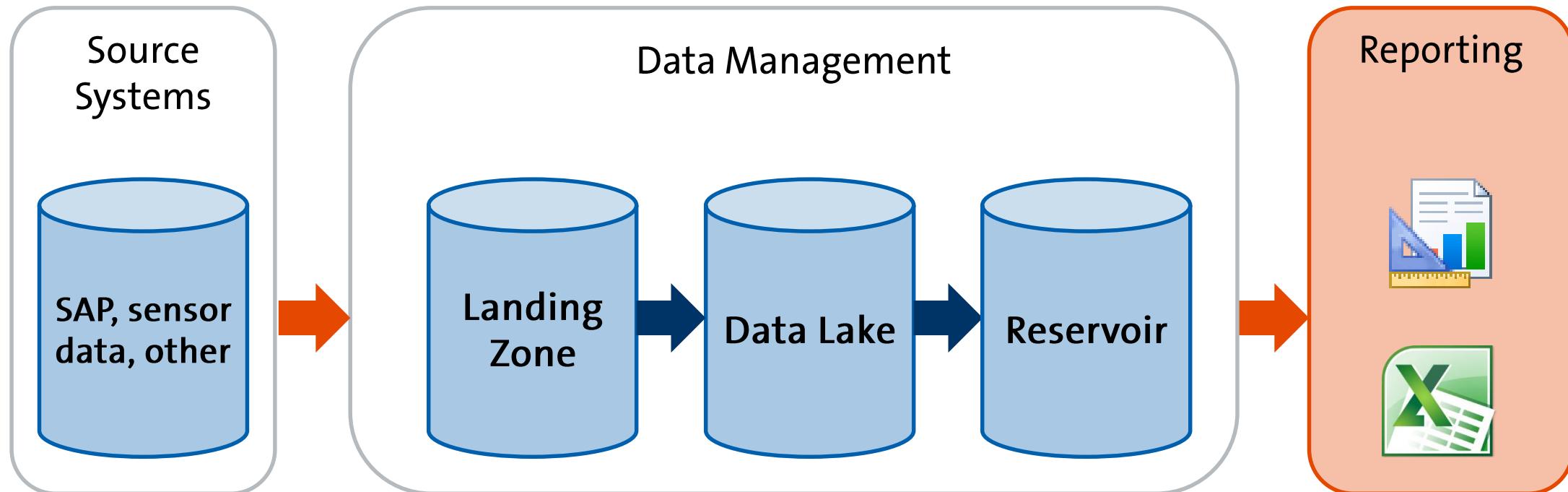
- All the data from the Landing Zone is being extracted
- The data is being merged into the data lake; taking care of delta handling; data is still considered raw data
- The Landing Zone data is then being truncated
- Data in the Data Lake is distributed across many servers, ensuring fast access and high availability

2nd layer: Data Management, Reservoir



- Data in the reservoir is associated with a certain division or use case
- This approach ensures data security and simplifies navigation
- Similar to Data Marts in BI system

3rd layer: Reporting



- Reports directly access data in the Reservoir
- The users who require the reports usually build them themselves
- Reports are stored at the same server as BI reports
- Report name convention: [artificial table name] e.g.: Analysis of material movements, Daily Sales Region South Africa

Fundamentals

- Use Cases BI & BA
- Architecture BI
- Architecture BA
- **Roles and Processes**



Business Intelligence & Analytics Roles

User



- Uses reports
- Raises requirements
- Usually decision makers and leaders

Power User



- Builds reports
- Supports users
- Trained in the handling of visualization tools
- Possesses BI&A knowhow

Business Information
Analyst



- Collects requirements and discusses them in the B&A Board meetings
- Manages the departmental BI&A strategy

Business Information
Owner

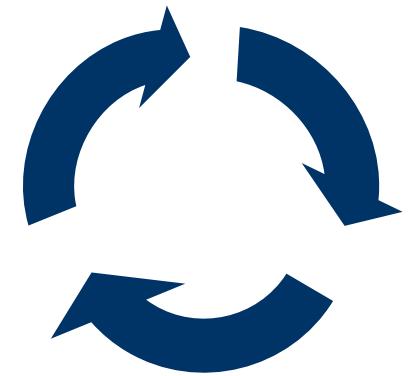


Communication

IM



- Develops systems
- Provides infrastructure
- Coordination of BI&A Operational Board



BI&A Operational
Board

- BI&A Operational Board Manager and one BI&A Analyst per function
- Prioritizes requirements

BI&A role definition: BI&A Strategic Board

Responsibilities

- Communicating results to all departments and subsidiaries transparently
- Deciding about prioritization of reporting and analytics requirements (Projects, Changes)
- Defining a strategic guideline
- Ensuring a standardized approach of prioritization for all departments
- Integrating subsidiaries as BI Users



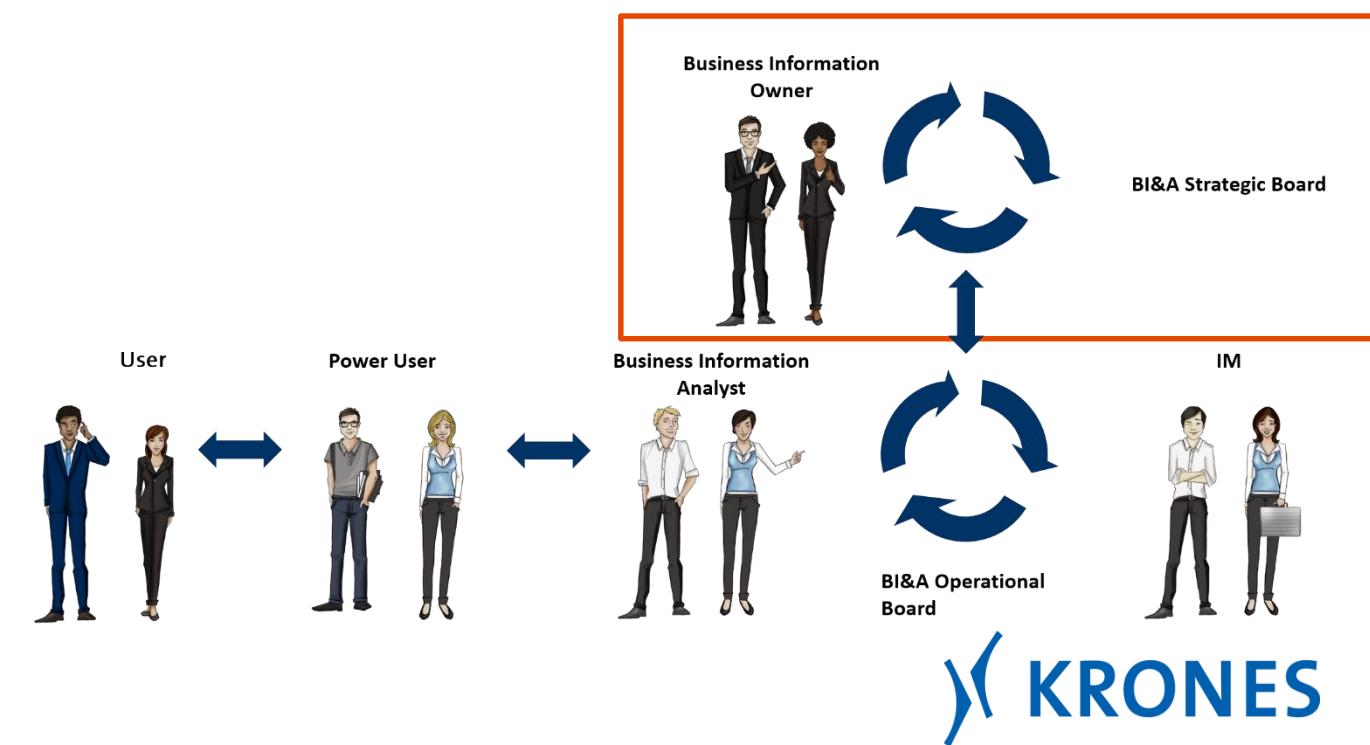
Six-monthly
(four weeks before release)



Business Information Owner of
each business function

Competences

- Knowledge of BI&A systems
- Knowledge of business processes and workflows
- Knowledge of company's strategy and market trends
- Knowledge of department's strategy



BI&A role definition: BI&A Operational Board

Responsibilities

- Administrating and creating consistent key figure definitions
- Assuring functional correctness and technical content of key figures
- Communicating results to BI&A Strategic Board, Power Users and Users transparently
- Handling of requirement processes
- Transferring knowledge within the Operational Board



Period

Quarterly
(four weeks before release)

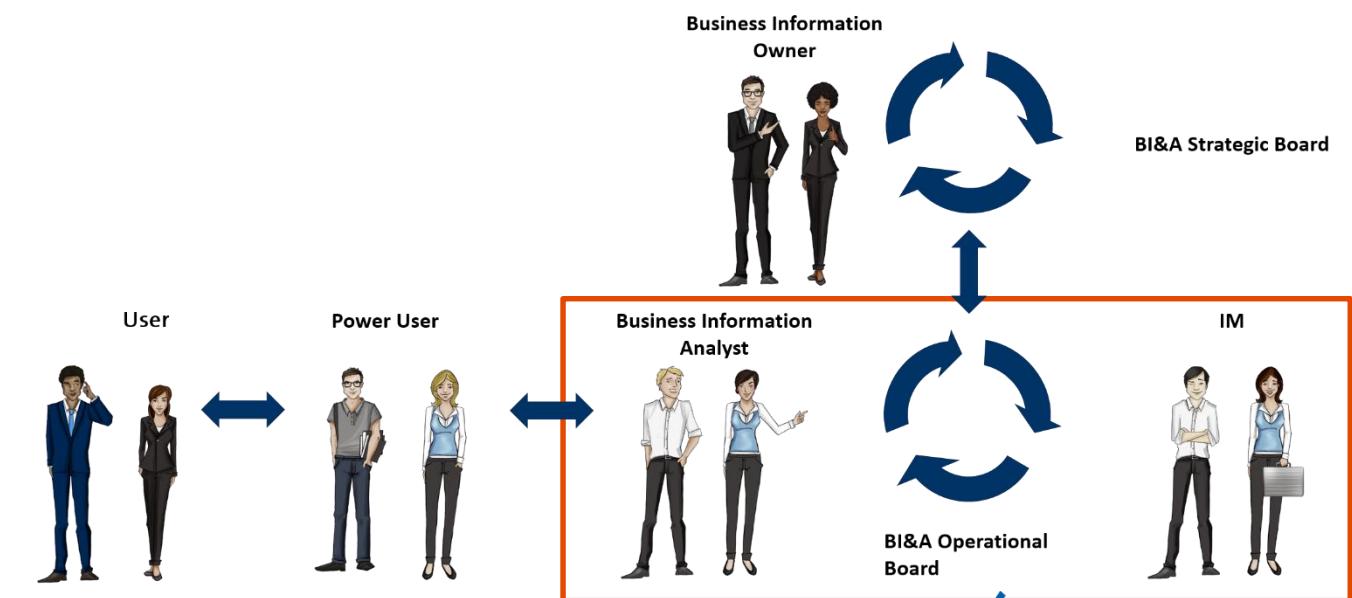


Structure

Business Information Owner of
each business function

Competences

- Knowledge of BI&A systems through training
- Knowledge of business processes and workflows
- Knowledge of department's strategy
- Knowledge of source systems (SAP etc.)



BI&A role definition: Business Information Owner

Responsibilities

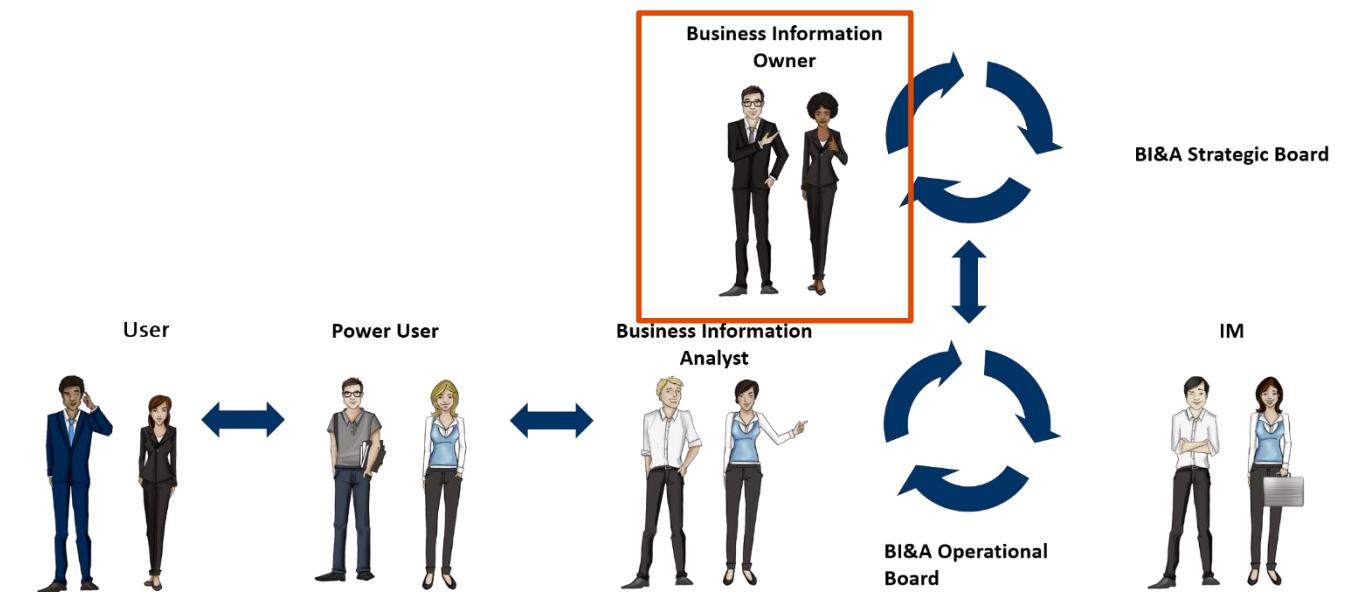
- Assuring compliance of authorization concept and data governance
- Assuring transformation of isolated solutions
- Committing to and driving of data quality approach
- Enhancing transparency regarding isolated solutions
- Including Business Information Analysts proactively

Competences

- Awareness of BI&A systems
- Knowledge of business processes and workflows
- Knowledge of company's strategy and market trends
- Knowledge of department's strategy

Tasks

- Communicating with the respective Business Information Analyst regarding decisions, strategy and changes of BI&A systems
- Coordinating Business Information Analysts
- Participating in BI&A Strategic Board



BI&A role definition: BI&A Operational Board Manager

Responsibilities

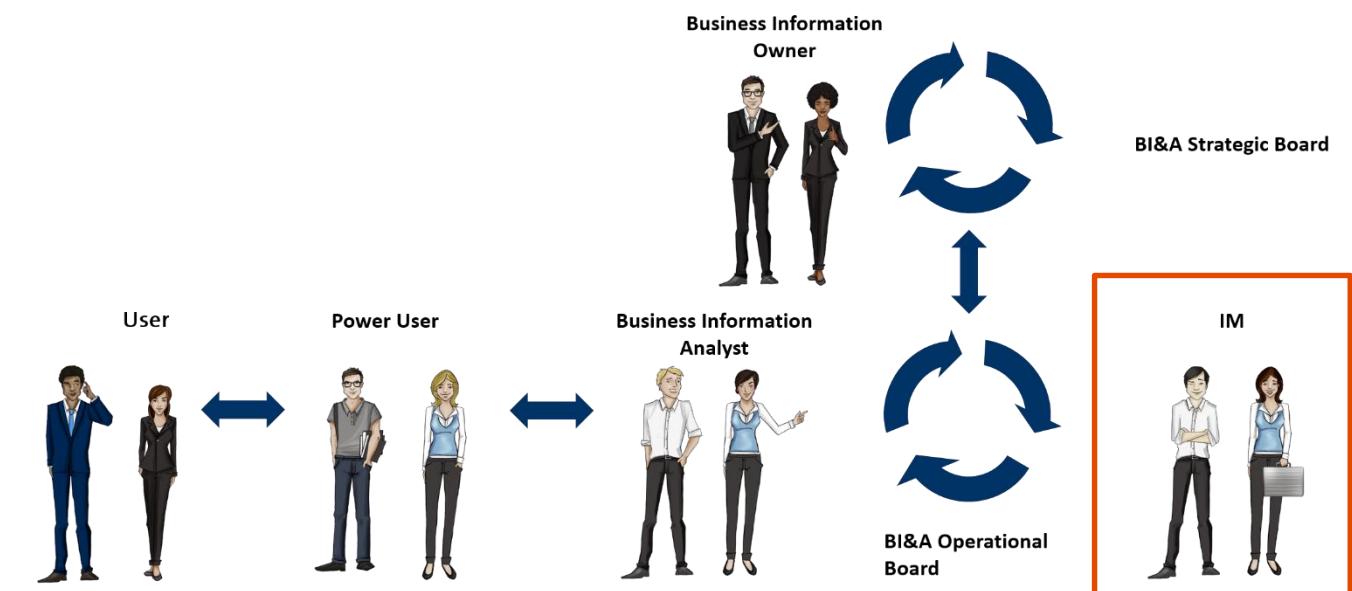
- Assuring compliance of authorization concept and data governance
- Keeping overview of all requirements
- Transforming isolated solutions into BI&A environment

Competences

- Knowledge of BI&A systems
- Knowledge of business processes and workflows
- Knowledge of source systems (SAP etc.)
- Management and de-escalation skills

Tasks

- Communicating with BI&A Strategic Board regarding BI&A strategy
- Coordinating cross-functional requirements
- Moderating BI&A Operational Board
- Organizing and holding BI&A Operational Board meetings
- Participating in BI&A Strategic Board



BI&A role definition: Business Information Analyst

Responsibilities

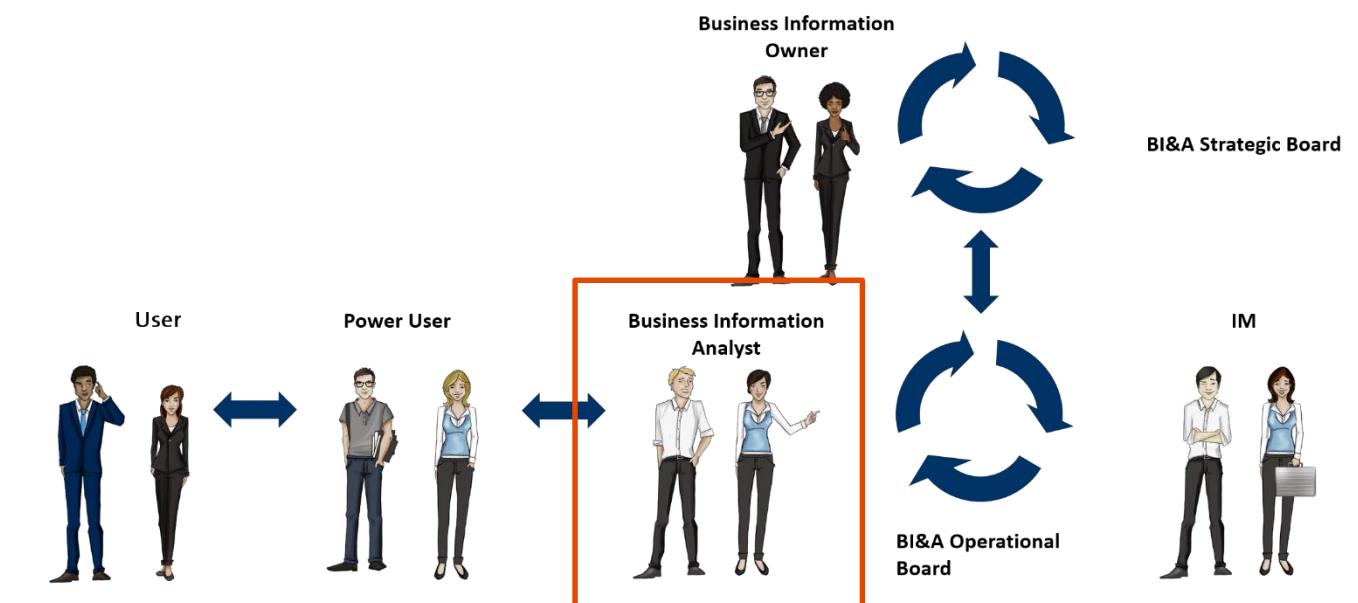
- Assuring compliance of authorization concept and data governance
- Communication towards Information Owners and Users
- Enhancing transparency regarding isolated solutions
- Including Users and Power Users proactively
- Transforming isolated solutions into BI&A environment

Competences

- Knowledge of BI&A systems through training
- Knowledge of business processes and workflows
- Knowledge of department's strategy
- Knowledge of source systems (SAP etc.)

Tasks

- Classifying changes
- Coordinating Power Users and their requests
- Participating in BI&A Operational Board
- Reviewing requests context-orientated
- Supporting Users and Power Users within their departments



BI&A role definition: Power User

Responsibilities

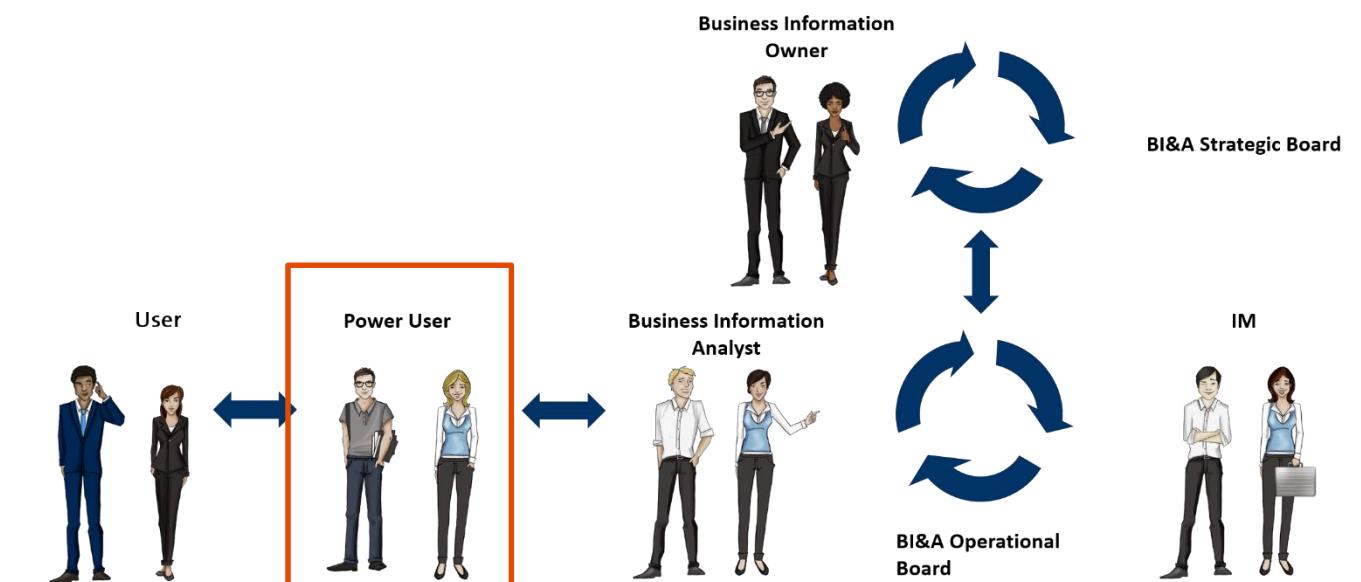
- Assuring data quality
- Following defined processes
- Informing Business Information Analysts about requirements

Competences

- Data visualization skills through training
- Field related expertise
- Knowledge of BI&A systems through training
- Knowledge of source systems (SAP etc.)

Tasks

- Building ad hoc reports
- Collecting and filtering requirements from Users
- Cooperating with Business Information Analysts
- Defining and building standard reports
- Supporting Users regarding report handling



BI&A role definition: User

Responsibilities

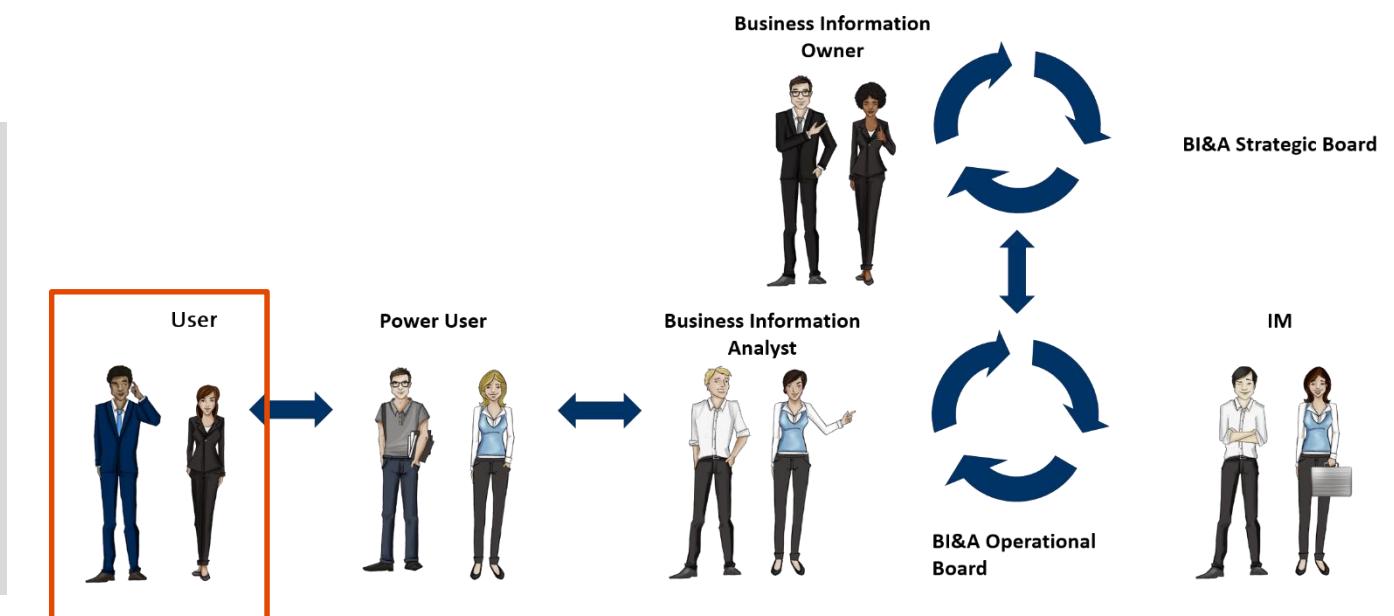
- Raising requirements to Power User
- Using information in BI&A as decision supporting systems

Competences

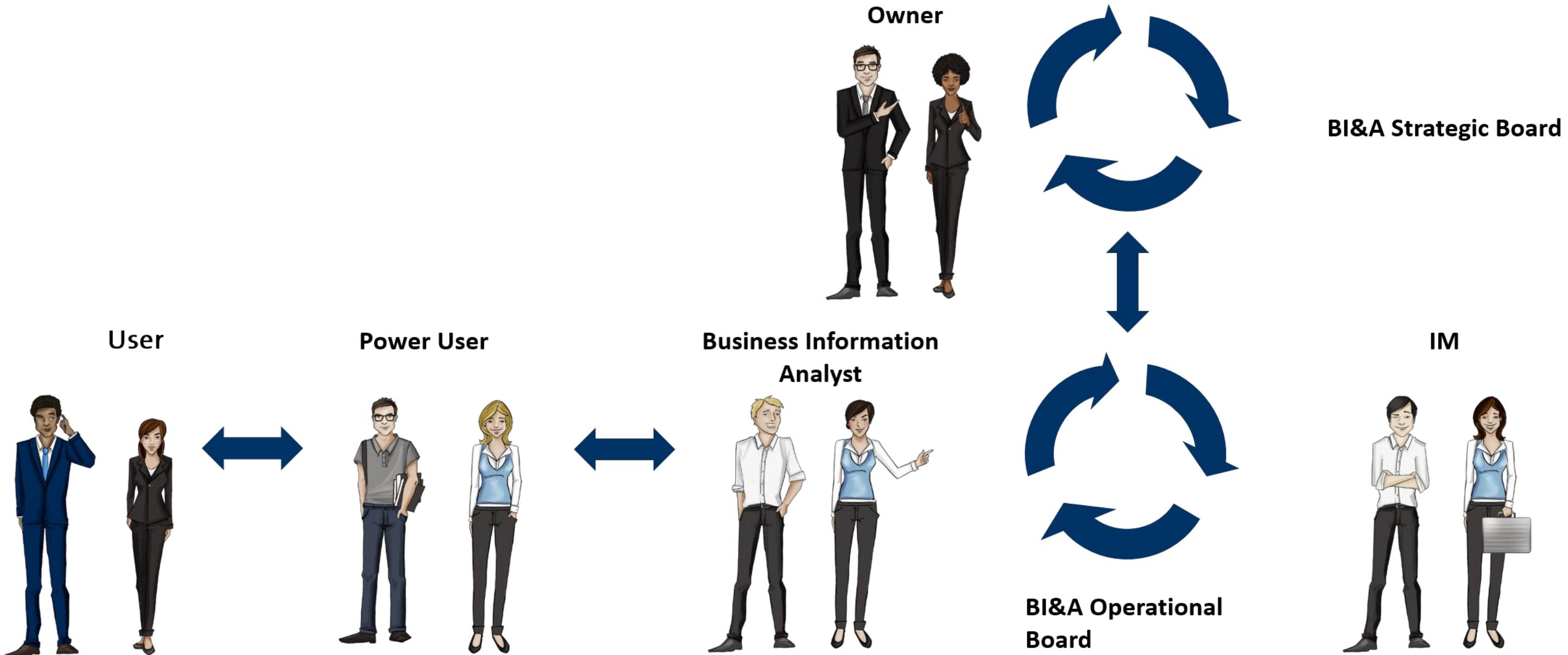
- Knowledge of BI&A reporting tools
- Knowledge of business processes and workflows
- Knowledge of source systems (SAP etc.)

Tasks

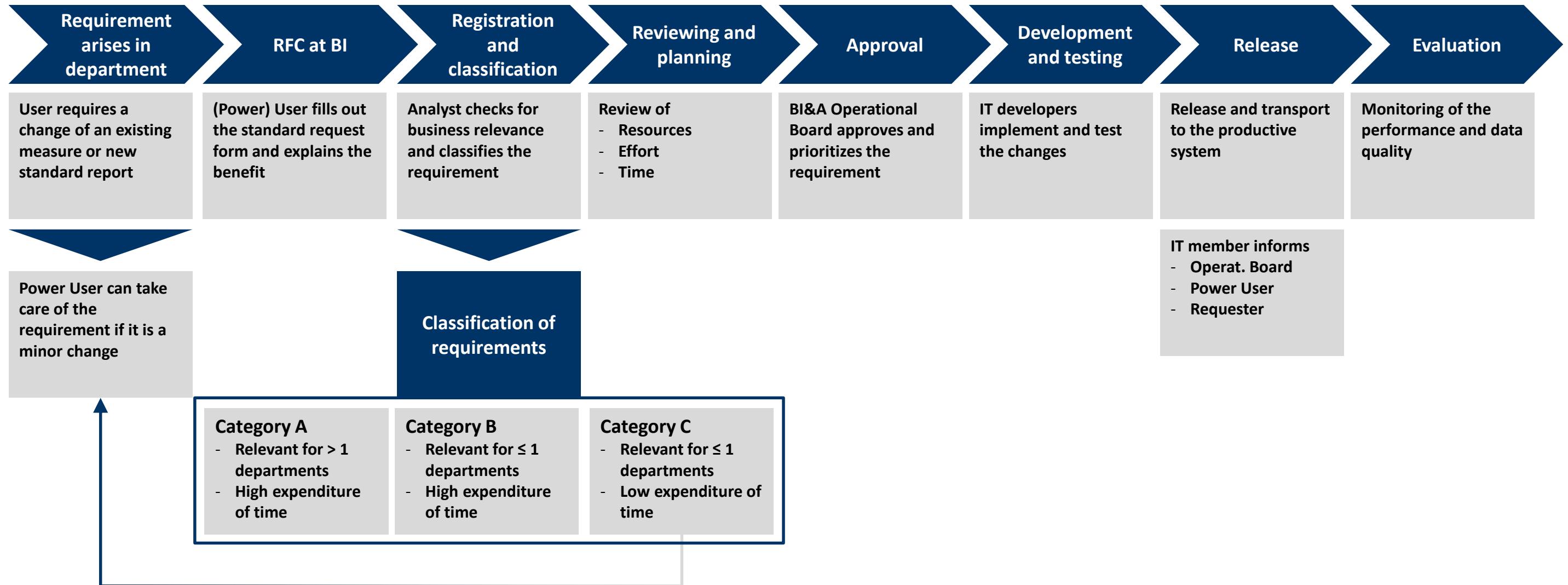
- Consuming reports and prepared information



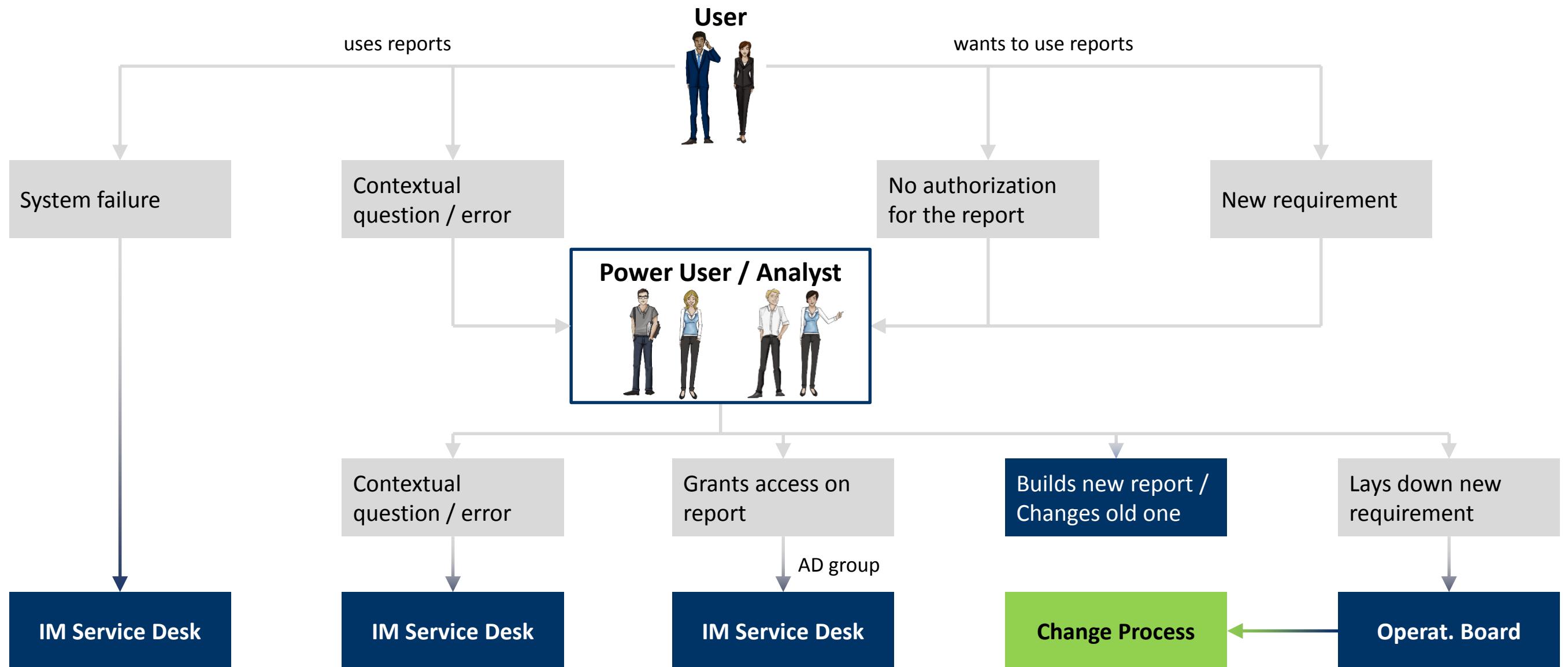
Look back: Roles at Krones BI&A



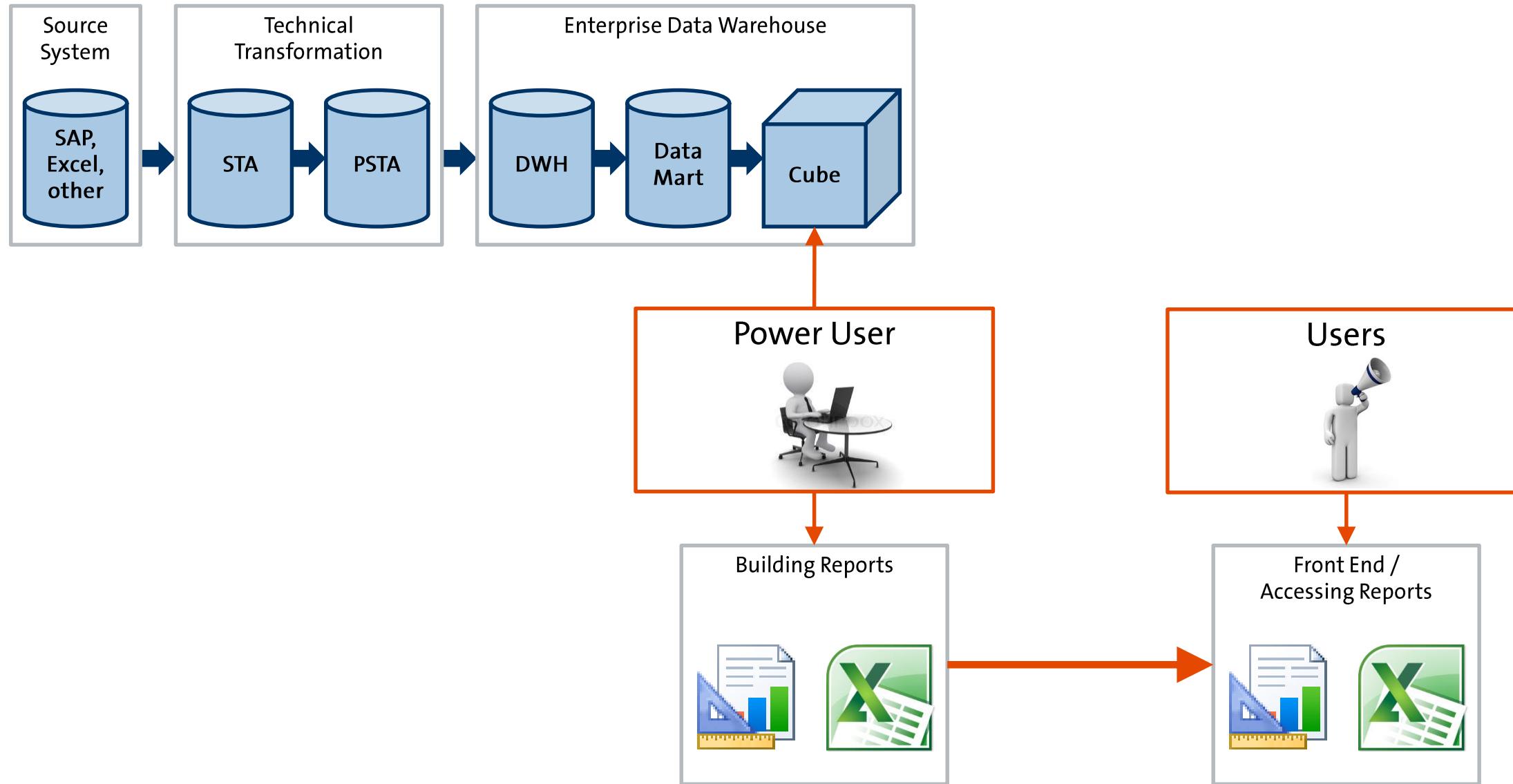
Requirements have to follow this process



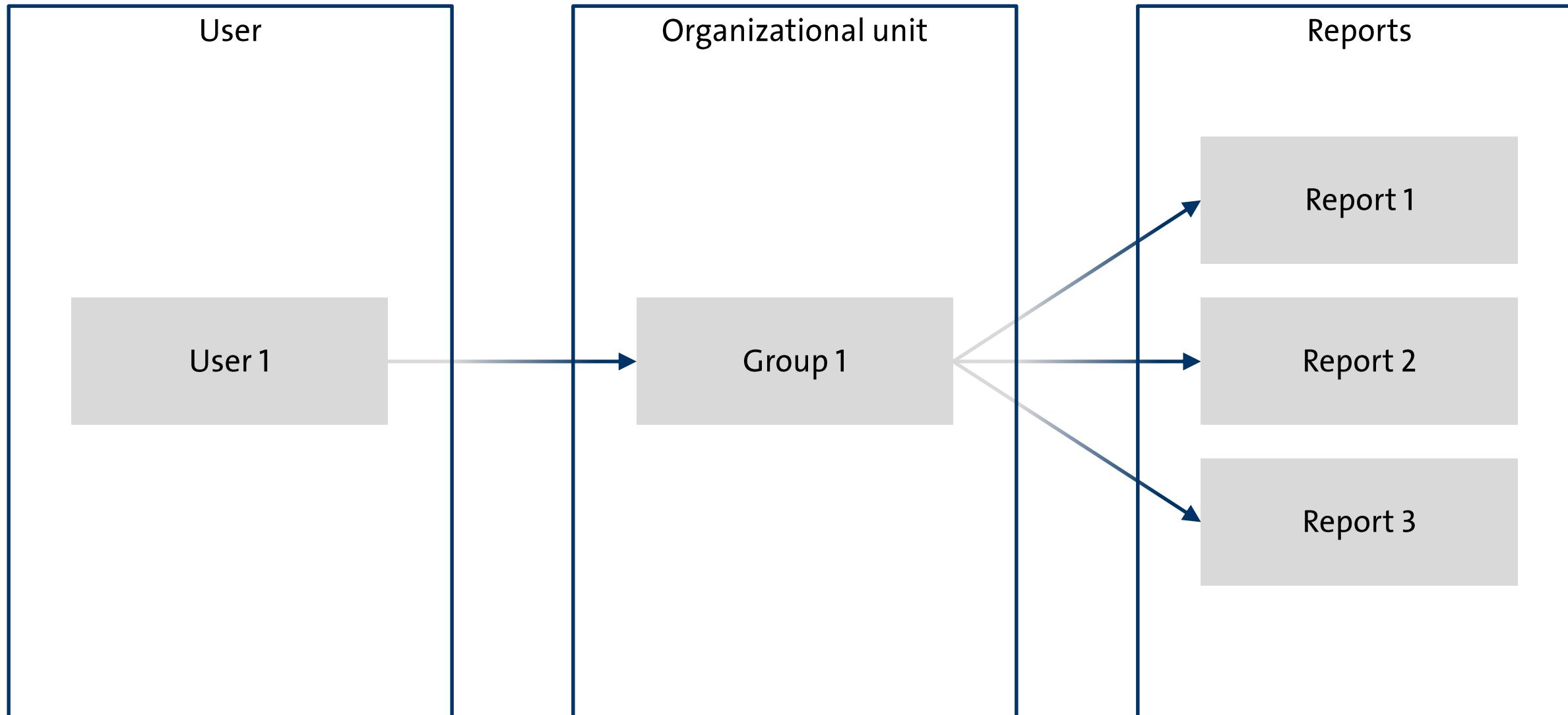
The BI&A support process is aligned with the IT support process at Krones



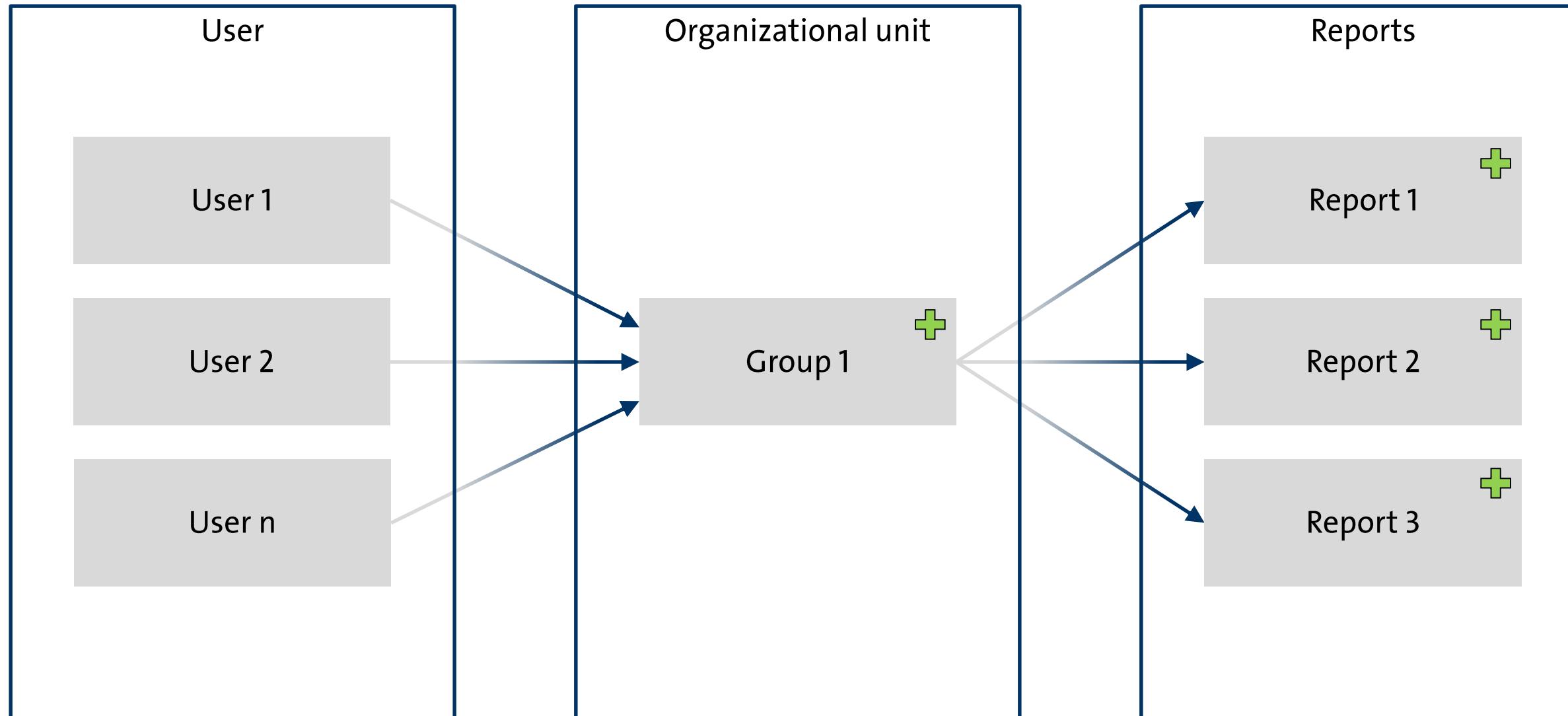
There are different access levels for Power Users and standard Users in BI



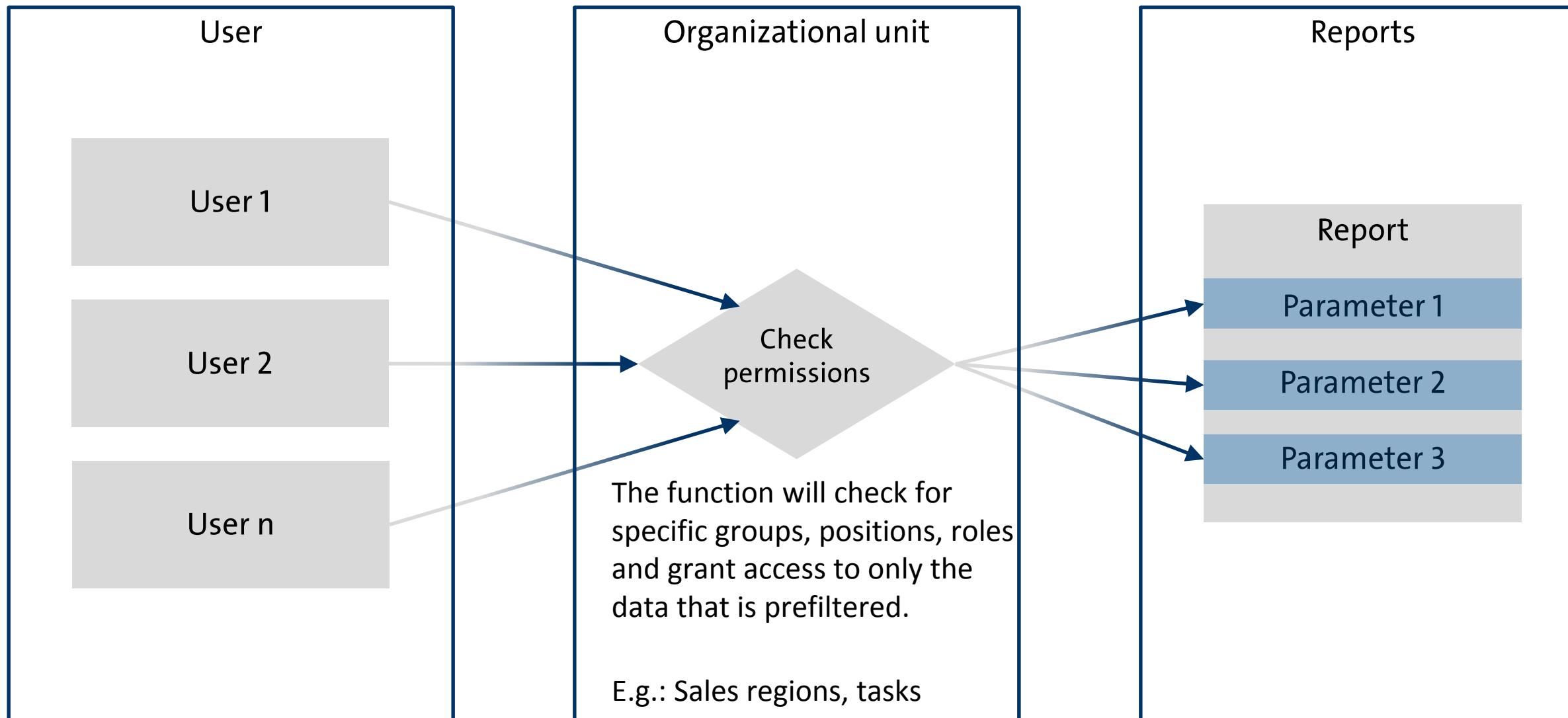
Users are grouped in organizational units which are then given access to reports



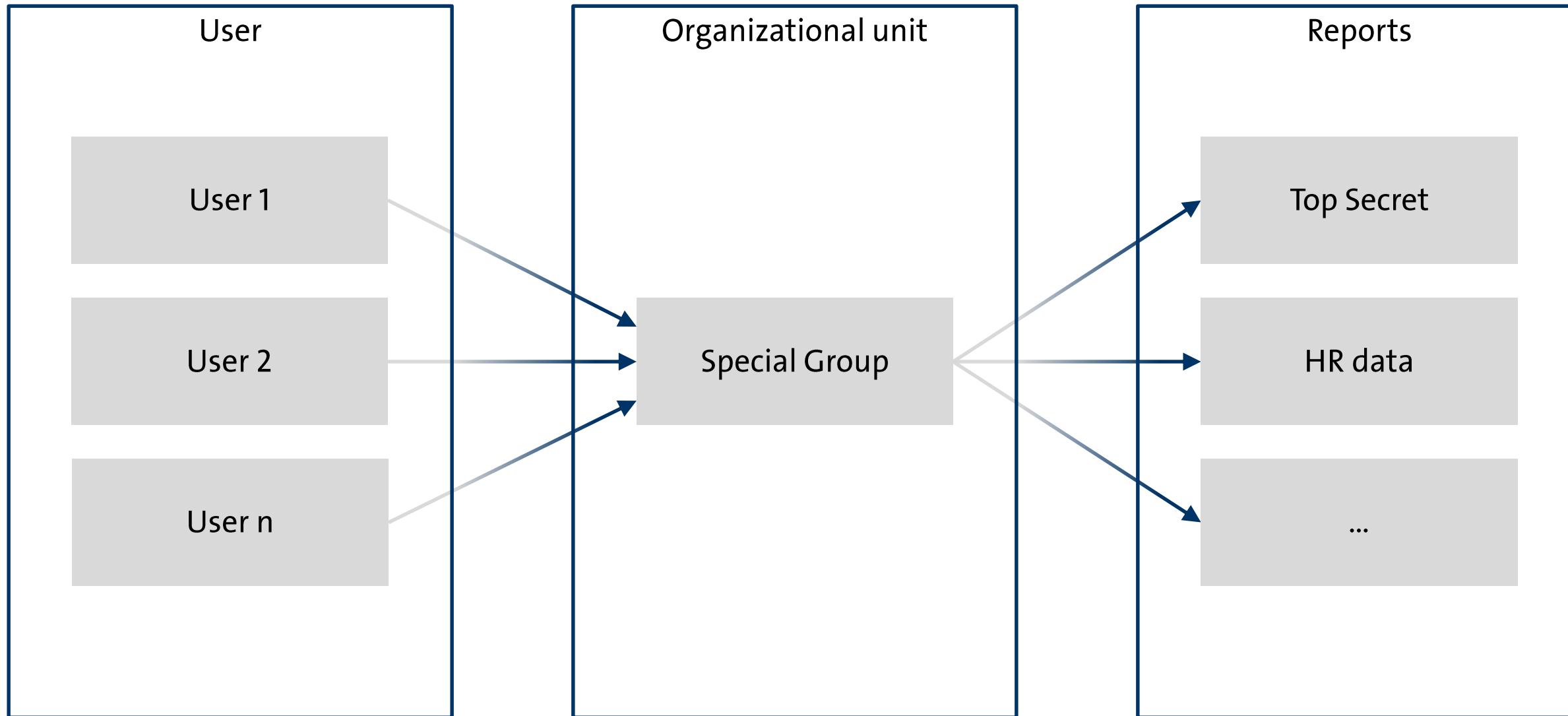
Organizational units or AD groups can easily be added and given access to selected reports



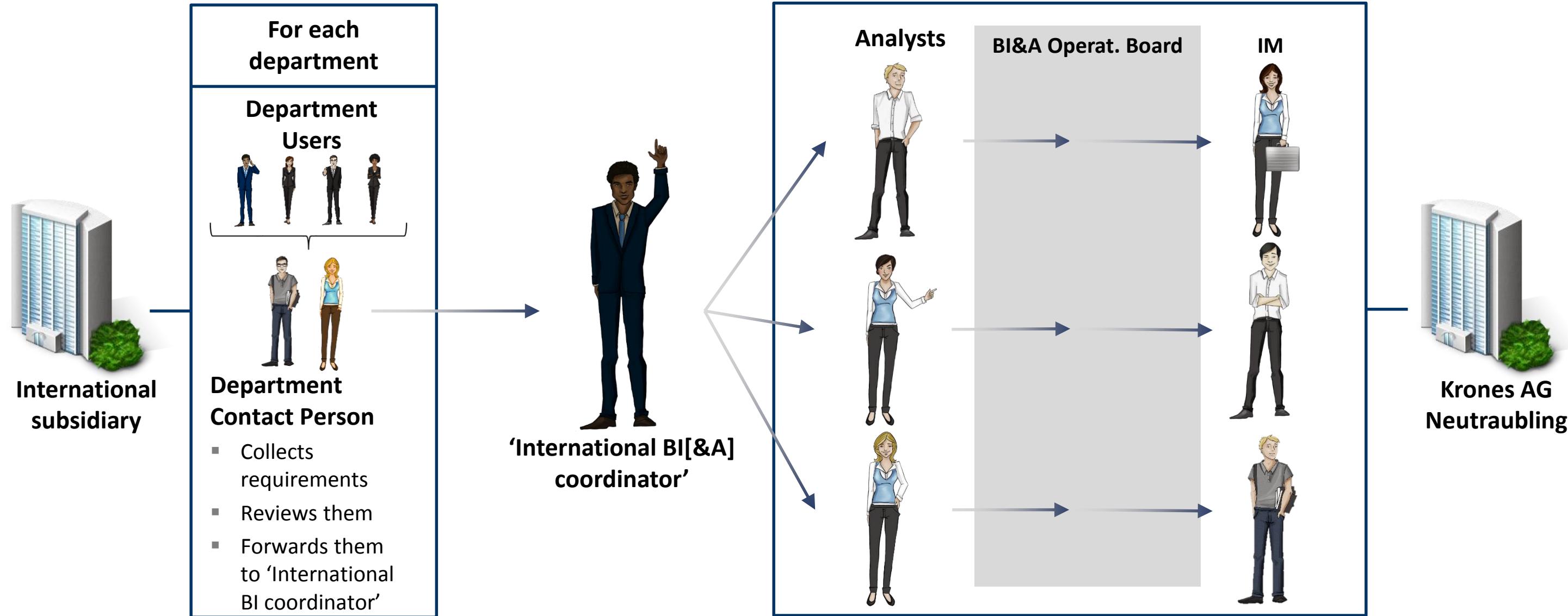
Data-driven accessibility means that Users can only see the data they are meant to see



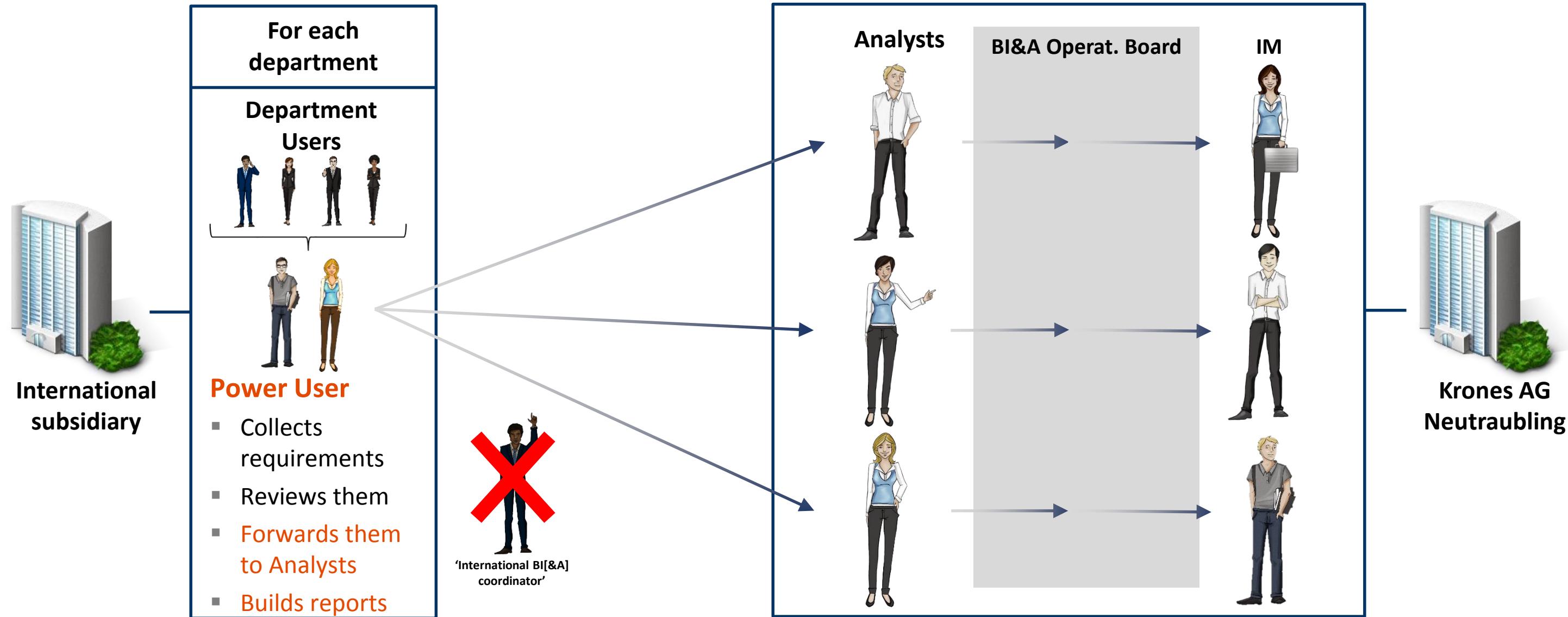
Special groups are necessary to grant access to sensitive data



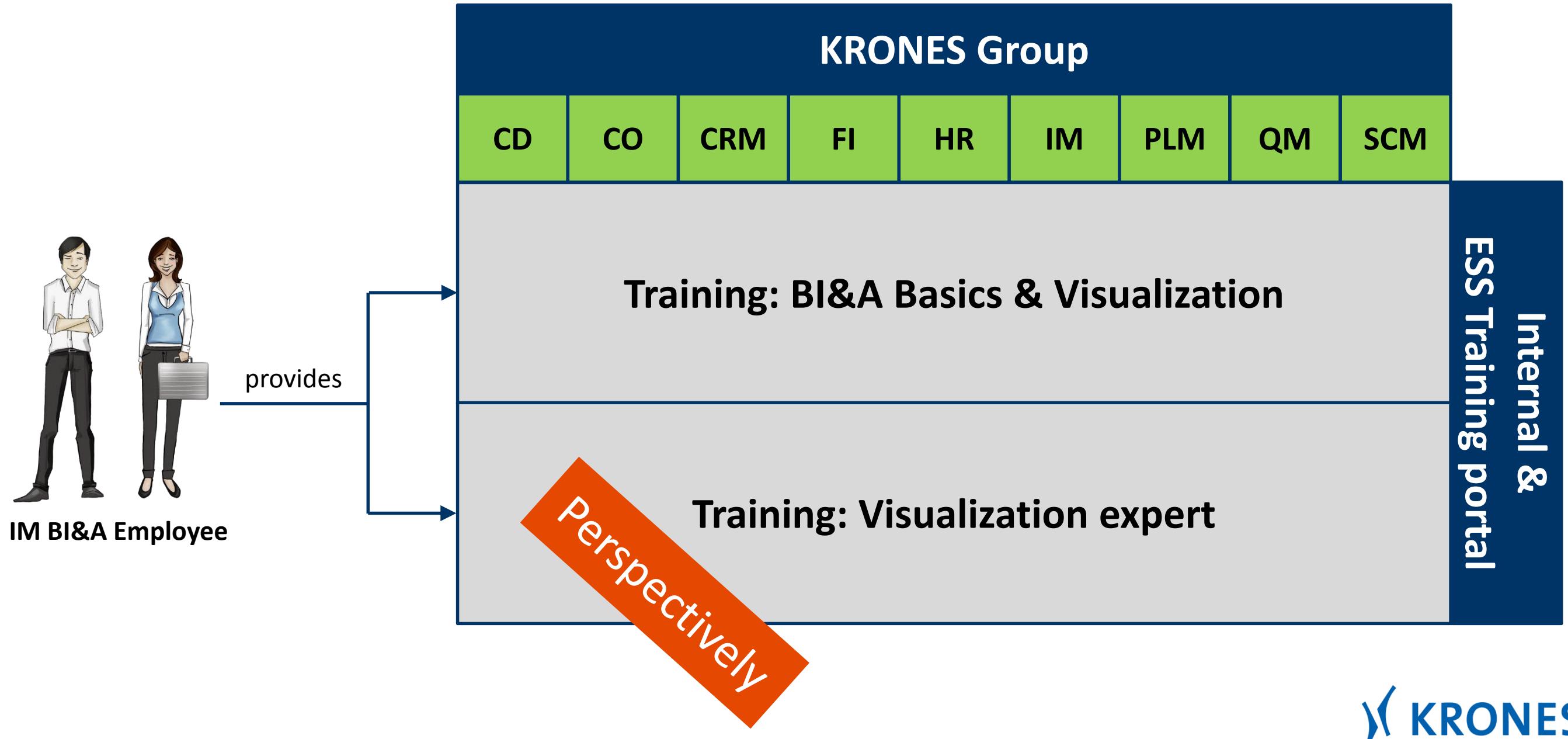
International subsidiaries are currently following an obsolete communication structure



International subsidiaries are currently following an obsolete communication structure



Trainings will be provided internally for all departments and subsidiaries by IM



Day 1

Introduction

Fundamentals

Data visualization with Excel

Day 2

Review and questions

Data visualization with Report Builder

Review, outlook and questions



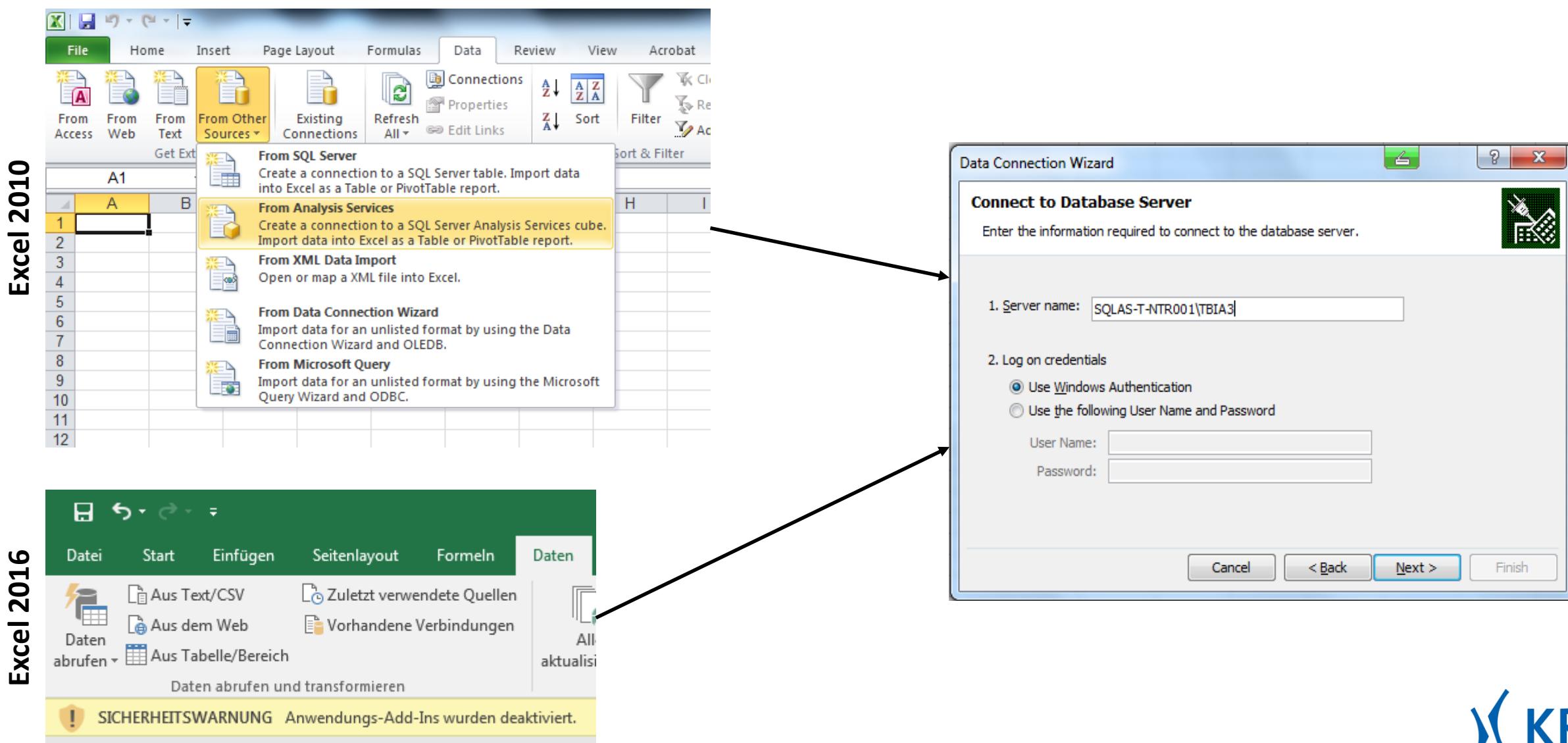
Data viz with Excel

- **Excel Pivot**
- **Excel Query**
- **Examples**



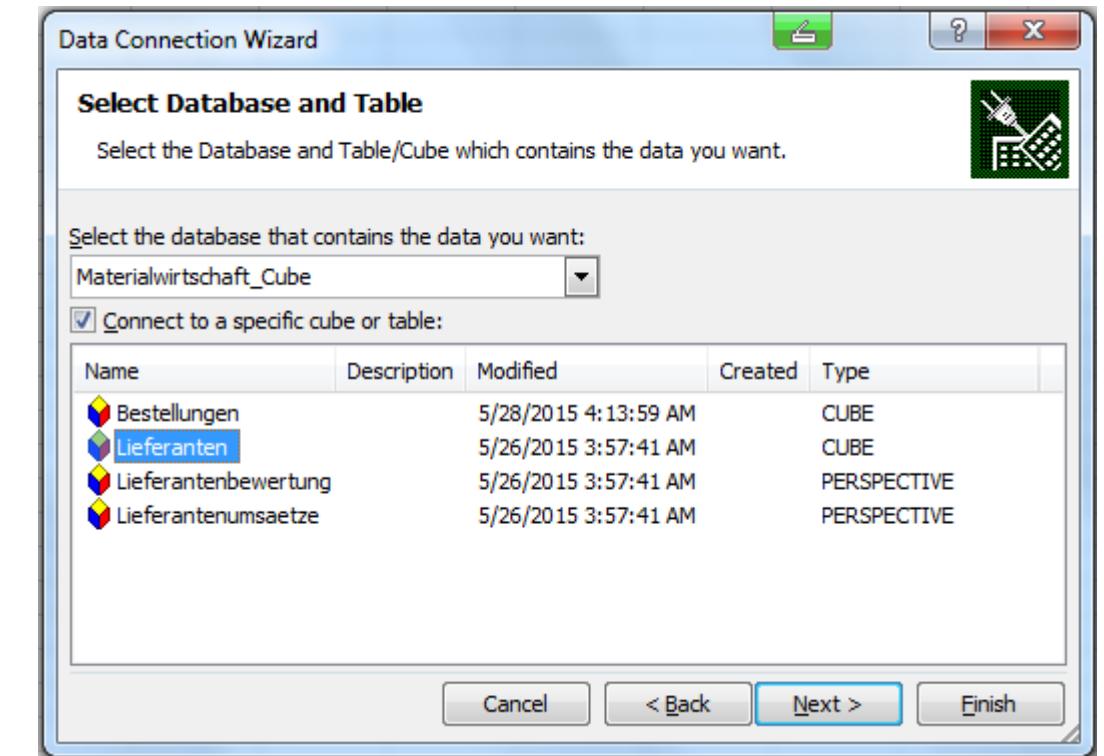
Connecting to the cube server is the first step to work with Excel Pivot

- Go to: Data -> From Other Sources -> From Analysis Services
- Enter the server name you want to connect to



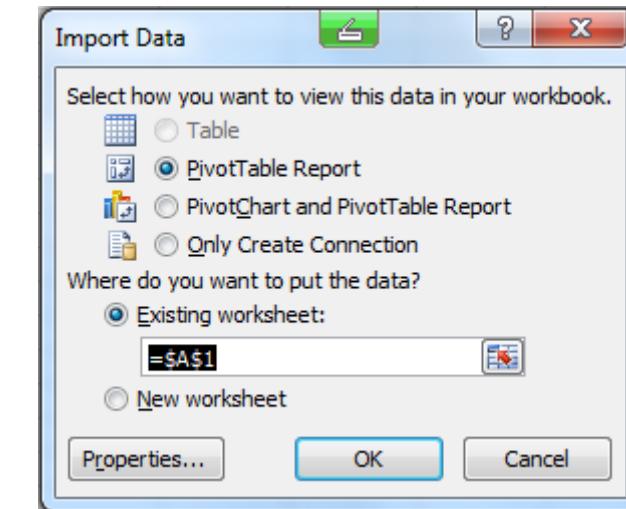
When on the server select the database and cube you want to connect to

- Select a database (Materialwirtschaft_Cube in this case)
- Select a cube (Lieferanten in this case)
- Notice that all technical names are **currently** in German, because all Power Users who build reports or Excel sheets are German speaking



You can select the general layout of your sheet before importing the data

- Select the layout of the Excel sheet
- Other elements can be added any time
- After this step is completed, the cube's data gets imported into Excel



Excel offers two new ribbon tabs for pivot functions

Excel 2010



Excel 2016

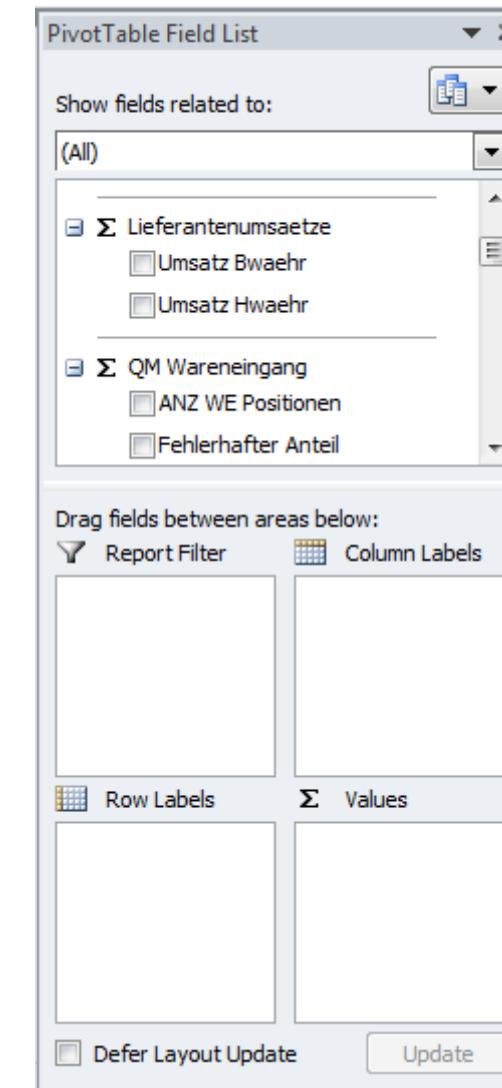


- ‘Options’ for functionality
 - Sorts, slicers, charts
- ‘Design’ for layouts
 - Color schemes, drill down layouts

Attributes, filters and measures you select in the field list will be displayed in the sheet

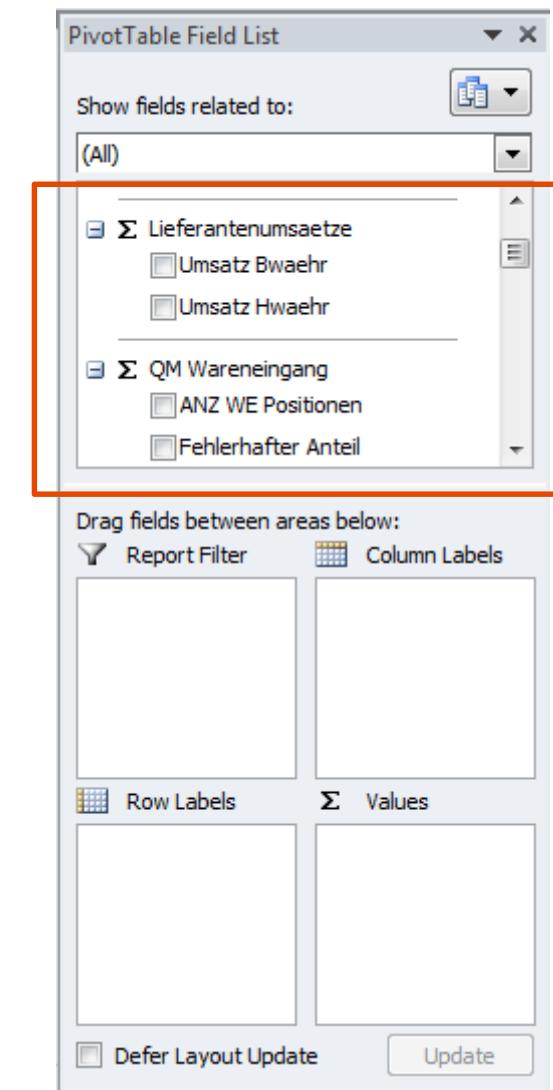
- Select the measures you would like to compare
- Select and drag the attributes you want to see
 - You can arrange attributes in rows or columns
- Select attributes as filters you would like to apply

- Hint:
 - Select the checkbox at ‘Defer Layout Update’ to make your selections faster
 - The table will otherwise update itself with every attribute, filter or measure you change



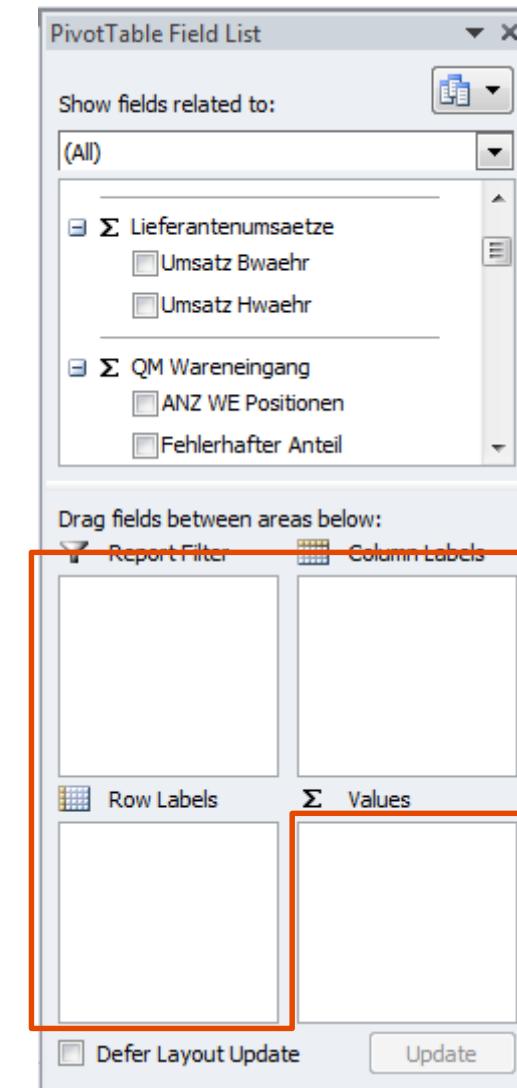
You can select any data from the cube you want to display

- The list contains all measure groups, measures, dimensions and dimension attributes
- You can select them by clicking the checkbox or dragging them in the corresponding fields



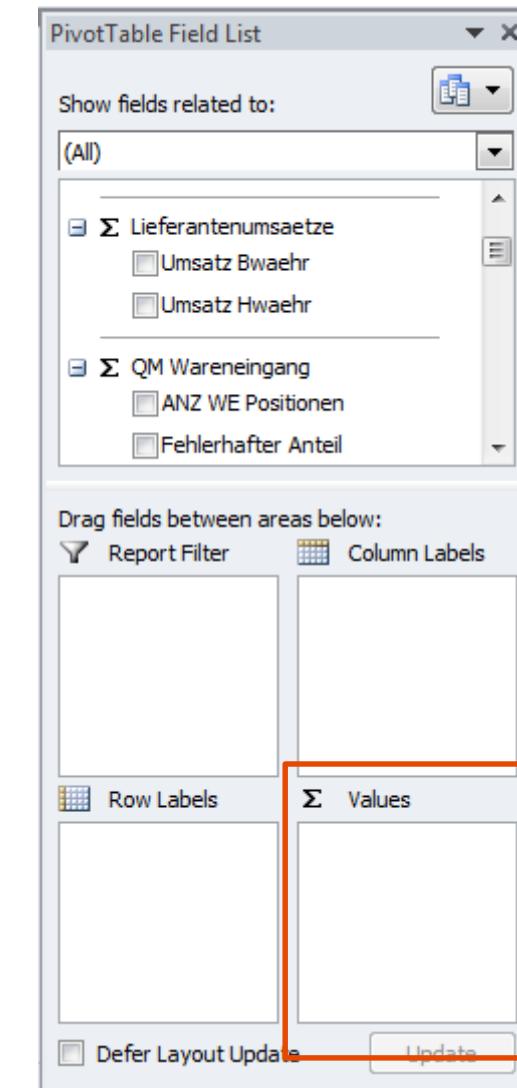
Dimension attributes can be arranged in rows, columns or applied as filters

- Dimension attributes can be dragged and dropped into the highlighted fields
- Successively added attributes will automatically lead to drill-down



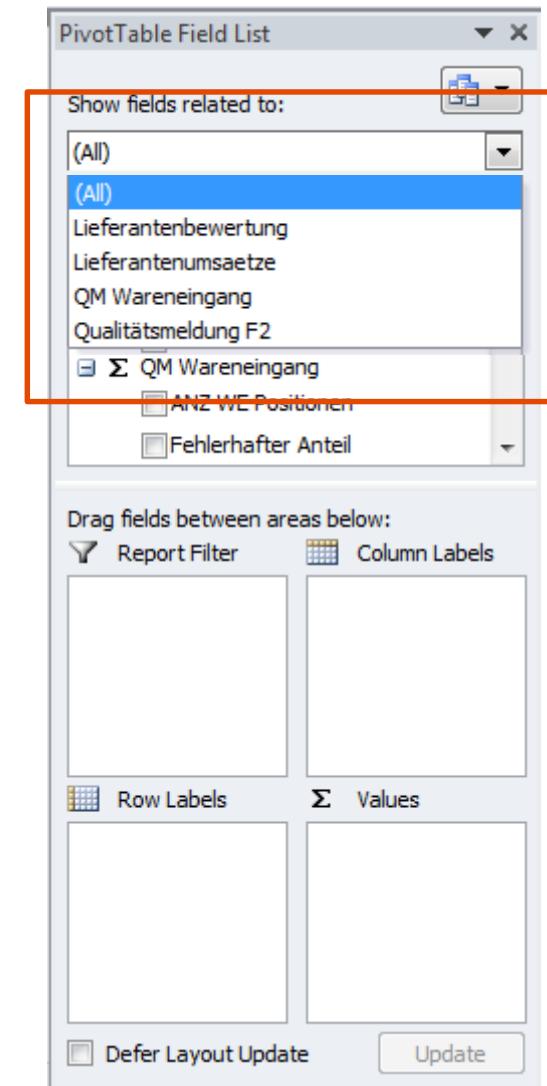
Measures will be put in the ‘Values’ fields

- If you select more than one measure, all data will be shown next to each other in the order you put them in



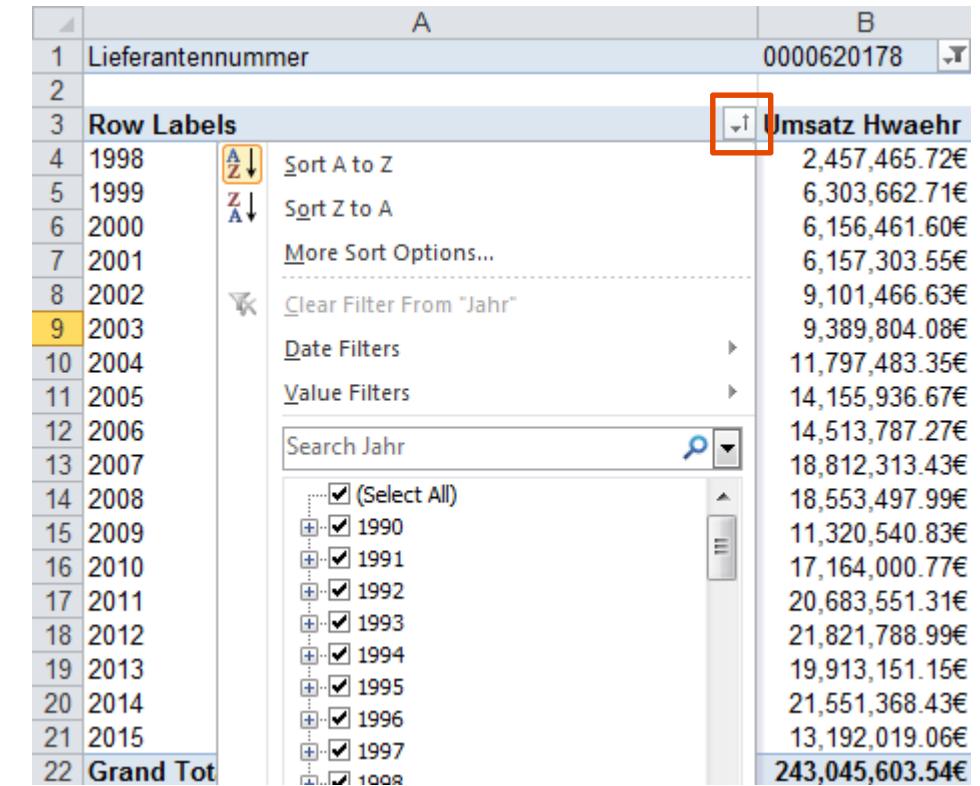
You can limit the amount of selectable measures by selecting a specific measure group

- Measure groups contain measures that belong together thematically
- By selecting a measure group only some the measures will be visible
- This also hides dimension attributes that do not fit into these measure groups



You can sort any attributes and show / hide values in the row or column labels settings

- Attributes in rows or columns can be sorted
- Manual sorting can be set up at ‘More sort options’
- These functions can also be found in the ‘Options’ menu



The screenshot shows a data visualization interface with a context menu open over a row label. The menu is titled 'Row Labels' and includes options for sorting (Sort A to Z, Sort Z to A, More Sort Options...), clearing filters, applying date filters, applying value filters, and a search bar for 'Jahr'. A red box highlights the 'Sort A to Z' option. The data table has two columns: 'Lieferantennummer' (Column A) and 'Umsatz Hwaehr' (Column B). Column B contains numerical values representing sales in euros. The 'Grand Tot' row at the bottom shows a total of 243,045,603.54€.

| A | B |
|---------------------|-----------------|
| 1 Lieferantennummer | 0000620178 |
| 2 | |
| 3 Row Labels | |
| 4 1998 | 2,457,465.72€ |
| 5 1999 | 6,303,662.71€ |
| 6 2000 | 6,156,461.60€ |
| 7 2001 | 6,157,303.55€ |
| 8 2002 | 9,101,466.63€ |
| 9 2003 | 9,389,804.08€ |
| 10 2004 | 11,797,483.35€ |
| 11 2005 | 14,155,936.67€ |
| 12 2006 | 14,513,787.27€ |
| 13 2007 | 18,812,313.43€ |
| 14 2008 | 18,553,497.99€ |
| 15 2009 | 11,320,540.83€ |
| 16 2010 | 17,164,000.77€ |
| 17 2011 | 20,683,551.31€ |
| 18 2012 | 21,821,788.99€ |
| 19 2013 | 19,913,151.15€ |
| 20 2014 | 21,551,368.43€ |
| 21 2015 | 13,192,019.06€ |
| 22 Grand Tot | 243,045,603.54€ |

Filters can be applied by selecting values of dimension attributes

- Filters will be shown in the first rows of each table
- It is possible to select multiple values of the same attribute
- Filters will not be shown in the actual Pivot table unless they are dragged into the column or row labels

The screenshot illustrates the process of applying filters in a multidimensional environment. On the left, a 'Search Jahr' (Search Year) dialog box is open, listing years from 2011 to 2017. The years 2014 and 2015 are expanded, showing quarters (Q1-Q4). In 2014, Q1 and Q2 are checked. In 2015, Q1 and Q2 are also checked. A checkbox for 'Select Multiple Items' is checked. The 'OK' button is highlighted in blue. To the right, a Pivot table is shown with two rows of filters at the top:

| A | B |
|---------------------|------------|
| 1 Lieferantennummer | 0000620178 |
| 2 Datum.J-Q-M-T | All |

An arrow points from the 'OK' button to the resulting Pivot table on the right, which displays sales data for 2014 and 2015:

| A | B |
|---------------------|------------------|
| 1 Lieferantennummer | 0000620178 |
| 2 Datum.J-Q-M-T | (Multiple Items) |
| 3 | |
| 4 Row Labels ↑ | Umsatz Hwaehr |
| 5 2014 | 10,462,722.64€ |
| 6 2015 | 11,354,373.61€ |
| 7 Grand Total | 21,817,096.25€ |

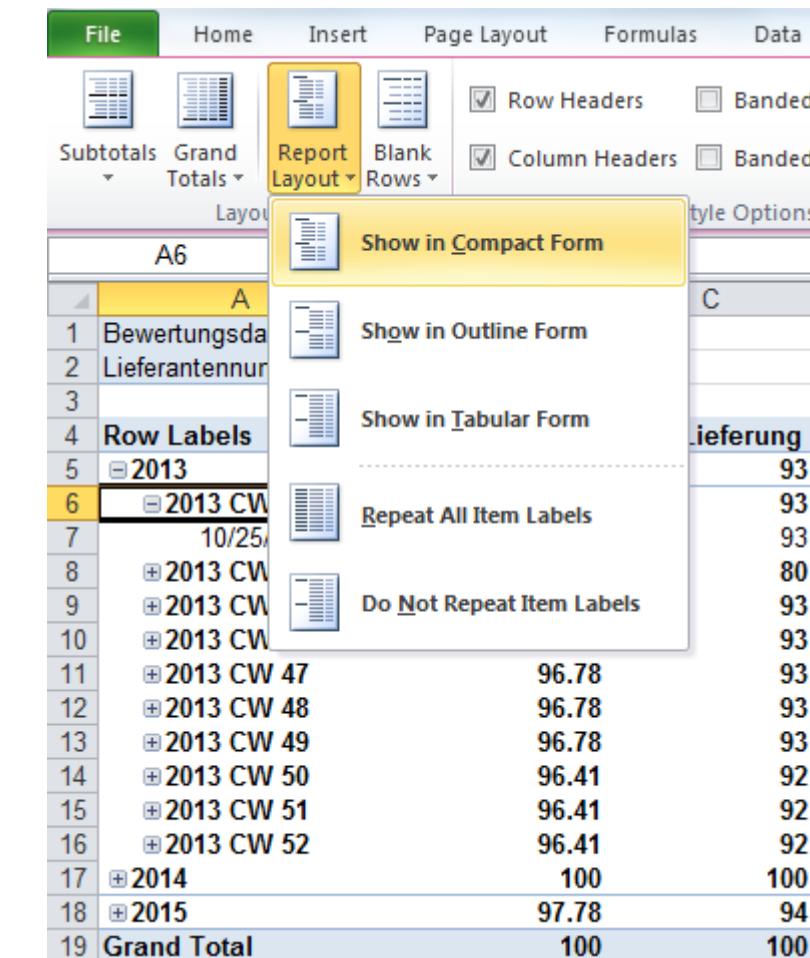
Value Field Settings can be applied to any measures to change how they are displayed

- Values can inter alia be displayed as
 - % of grand total
 - % of column total
 - % of row total
 - % of parent grand total (for hierarchies)
 - % of [other field]; e.g.: % of predecessor
 - Difference from [other field]
 - Rank smallest to largest (or vice versa)

The screenshot shows a pivot table and a 'Value Field Settings' dialog box. The pivot table has columns A and B. Row 1 contains 'Lieferantennummer' and '0000620178'. Row 2 contains 'Datum.J-Q-M-T' and '(Multiple Items)'. Row 4 is a Row Labels header for 'Umsatz Hwaehr'. Rows 5, 6, and 7 show data for years 2013, 2014, and 2015 respectively, with values 30.93%, 33.12%, and 35.95%. Row 8 is a Grand Total row with value 100.00%. The 'Value Field Settings' dialog is open, showing 'Source Name: Umsatz Hwaehr' and 'Custom Name: Umsatz Hwaehr'. Under 'Show values as', '% of Grand Total' is selected. The 'Base field:' dropdown contains 'Lieferantennummer', 'Jahr' (which is highlighted), and 'Jahr'. The 'Number Format' button is visible at the bottom right of the dialog.

You can change the report's layout in the 'Design' ribbon tab

- You can change
 - Display of subtotals and grand totals
 - Display of rows and columns
 - Display of blank rows
 - More to come in the examples

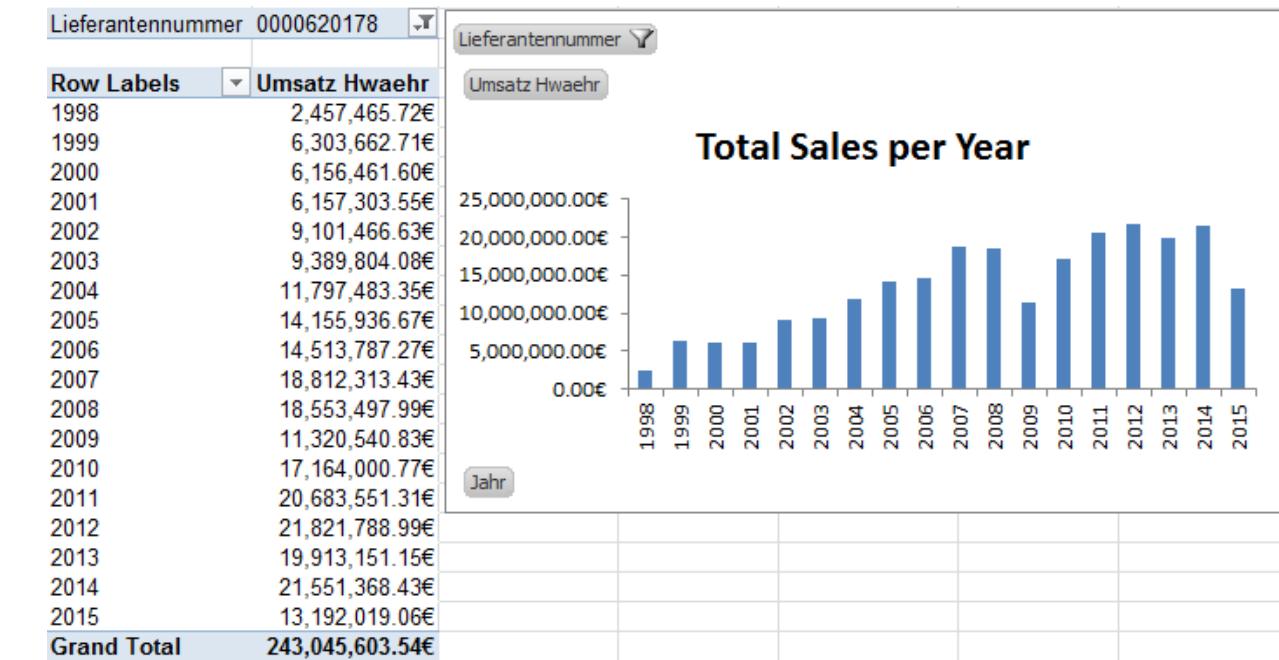


The screenshot shows the Microsoft Excel ribbon with the 'File', 'Home', 'Insert', 'Page Layout', 'Formulas', and 'Data' tabs. The 'Page Layout' tab is selected. In the 'Report Layout' section, the 'Report Layout' button is highlighted with a yellow box, and a dropdown menu is open, also highlighted with a yellow box. The dropdown menu contains six options: 'Show in Compact Form', 'Show in Outline Form', 'Show in Tabular Form', 'Repeat All Item Labels', 'Do Not Repeat Item Labels', and 'Row Headers' (which has a checked checkbox next to it). Below the dropdown menu, a portion of a data table is visible, showing columns A, B, and C with various data entries.

| A | B | C |
|----|----------------|----------|
| 1 | Bewertungsda | ieferung |
| 2 | Lieferantennur | 93 |
| 3 | | 93 |
| 4 | Row Labels | ieferung |
| 5 | 2013 | 93 |
| 6 | 2013 CW | 93 |
| 7 | 10/25/ | 93 |
| 8 | + 2013 CW | 80 |
| 9 | + 2013 CW | 93 |
| 10 | + 2013 CW | 93 |
| 11 | + 2013 CW 47 | 93 |
| 12 | + 2013 CW 48 | 93 |
| 13 | + 2013 CW 49 | 93 |
| 14 | + 2013 CW 50 | 92 |
| 15 | + 2013 CW 51 | 92 |
| 16 | + 2013 CW 52 | 92 |
| 17 | + 2014 | 100 |
| 18 | + 2015 | 94 |
| 19 | Grand Total | 100 |

Charts can be created on the data displayed in the table

- Click on **Options -> PivotChart**
- Select the layout and change the data as you want it to be
- Display of rows and columns
 - Display of blank rows
 - More to come in the examples



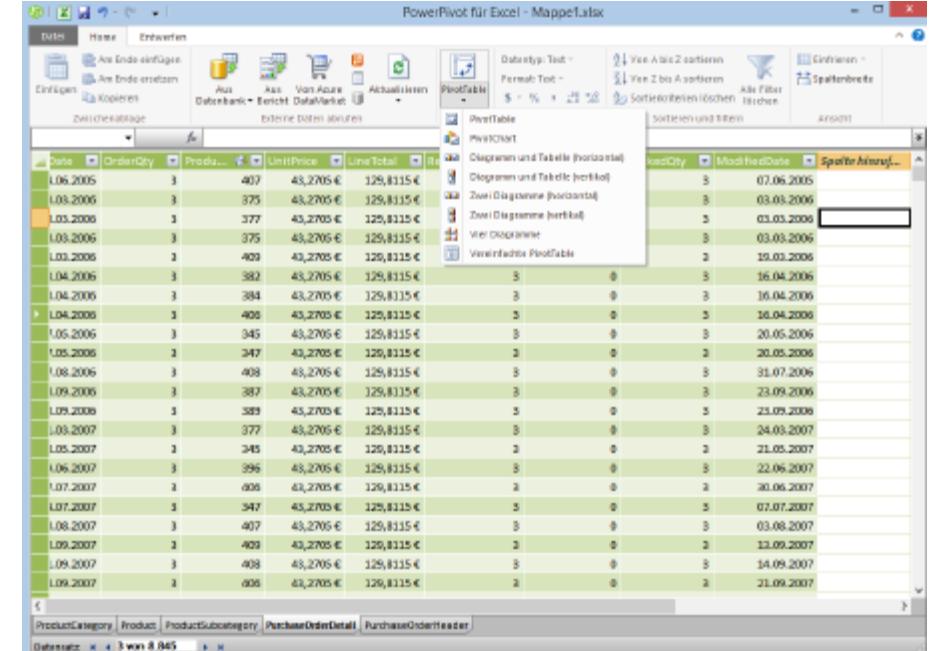
Data viz with Excel

- Excel Pivot
- **Excel Query**
- Examples



Power Pivot imports all selected data of a cube in MS Excel

- Millions of rows can be imported
- Data will be compressed and stored in the main memory
 - Main memory is a limitation
- Data can be imported from various sources and combined through relations
- Additional columns and calculations can be added in each table
 - All calculations are executed on the client
 - Client's computing power is a limitation
- Data is stored in tabs labeled as the tables it was imported from
- **Dropped** by the BI Board, because it was too complicated to handle for users



The screenshot shows the Microsoft Excel ribbon with the "PowerPivot" tab selected. Below the ribbon, there are several tabs representing imported tables: "ProductCategory", "Product", "ProductSubcategory", "PurchaseOrderDetail", and "PurchaseOrderHeader". The main area displays a large dataset with columns: Date, OrderQty, ProductID, UnitPrice, and LineTotal. The data consists of approximately 8,845 rows, showing purchase details over time. The PowerPivot ribbon has various options like "Zeilentabellen", "PivotTable", and "PivotChart". The status bar at the bottom indicates "Datenanzahl: 8,845 von 8,845".

Data viz with Excel

- Excel Pivot
- Excel Query
- Examples



Complete the following steps to create a report in Excel.



We will complete the following tasks to deepen our understanding

- Objectives to complete
 - Connect to SSAS database server
 - Connect to database **LifecycleService_Cube** and select cube **ServiceReporting**
 - Show **Kosten CO (Costs CO)**
 - Filter for **Business partner.Kontinent Geographisch (Continent Geographical)** = ‘Europe’
 - Display the hierarchy **Datum Kosten.J-Q-M-T (Date Costs.Y-Q-M-D)** in row groups and put the years as a filter
 - Filter for **Year** = ‘2017’
 - Create a fitting chart
 - Open the drill down menus
- Optional
 - Which customers in Europe are associated with the highest costs in the last three months?

We do more.

Day 1



KRONES

www.krones.com

KIC KRONES

www.kic-krones.com

KOSME

www.kosme.com

KONPLAN

www.konplan.cz

EVOGUARD

www.evoguard.com

SYSKRON

www.syskron.com

HST
KRONES GROUP

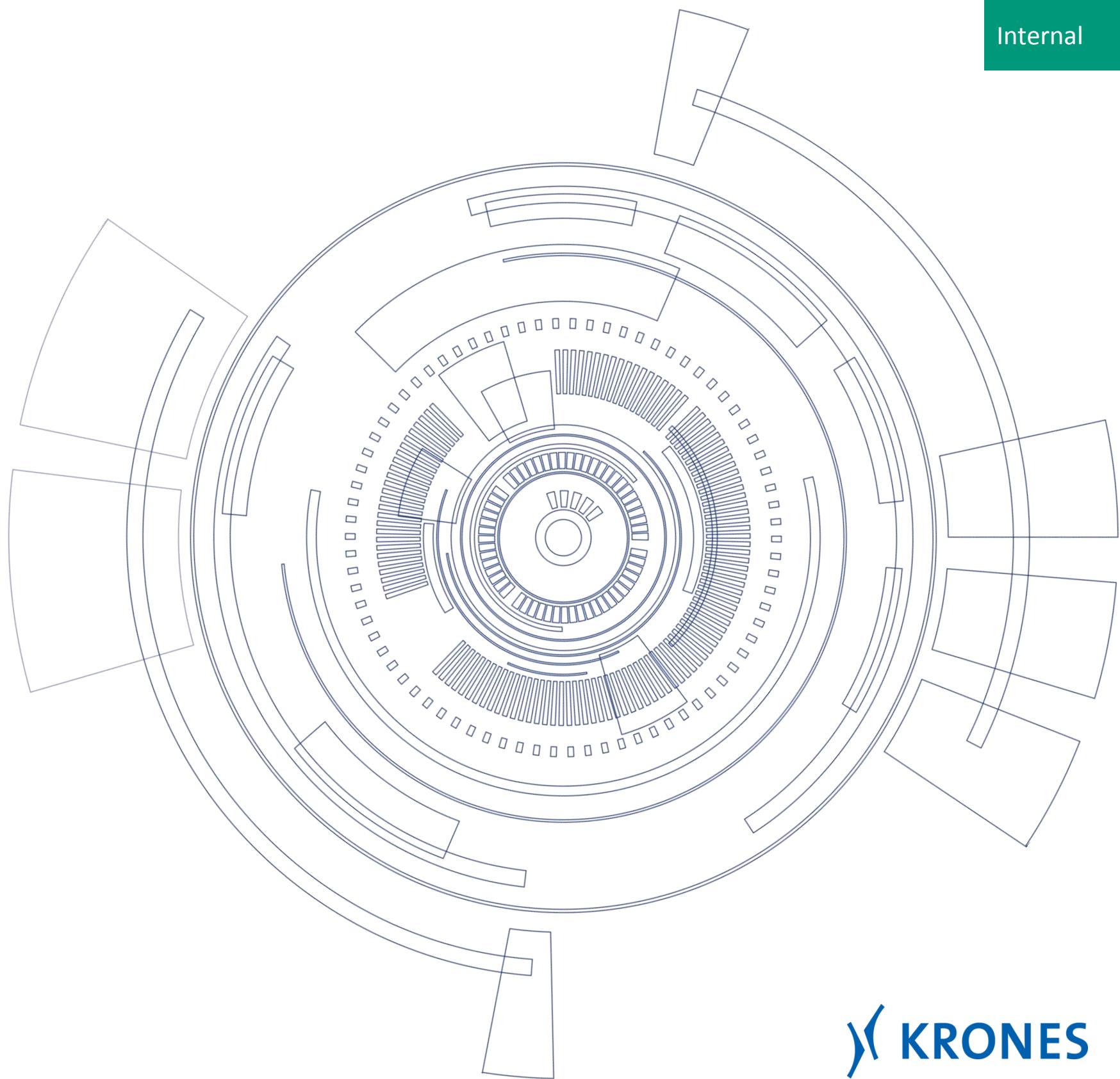
www.hst-maschinenbau-gmbh.de

MILKRON

www.milkron.com

BI&A Basics and Data Visualization

KRONES internal training



Agenda

Day 1

Introduction

Fundamentals

- Objectives and benefits
- BI&A architecture
- BI&A processes

Data visualization with Excel

- Fundamentals Reporting Services
- Use cases of Excel Reporting
- Excel Pivot
- Case studies and examples

Day 2

Review and questions

Data visualization with Report Builder

- Use cases of Report Builder
- Reporting server and strategy
- Case studies and examples (template and basics)

Data visualization with Report Builder

- Case studies and examples (functions and presentation)

Review, outlook and questions

Day 1

Introduction

Fundamentals

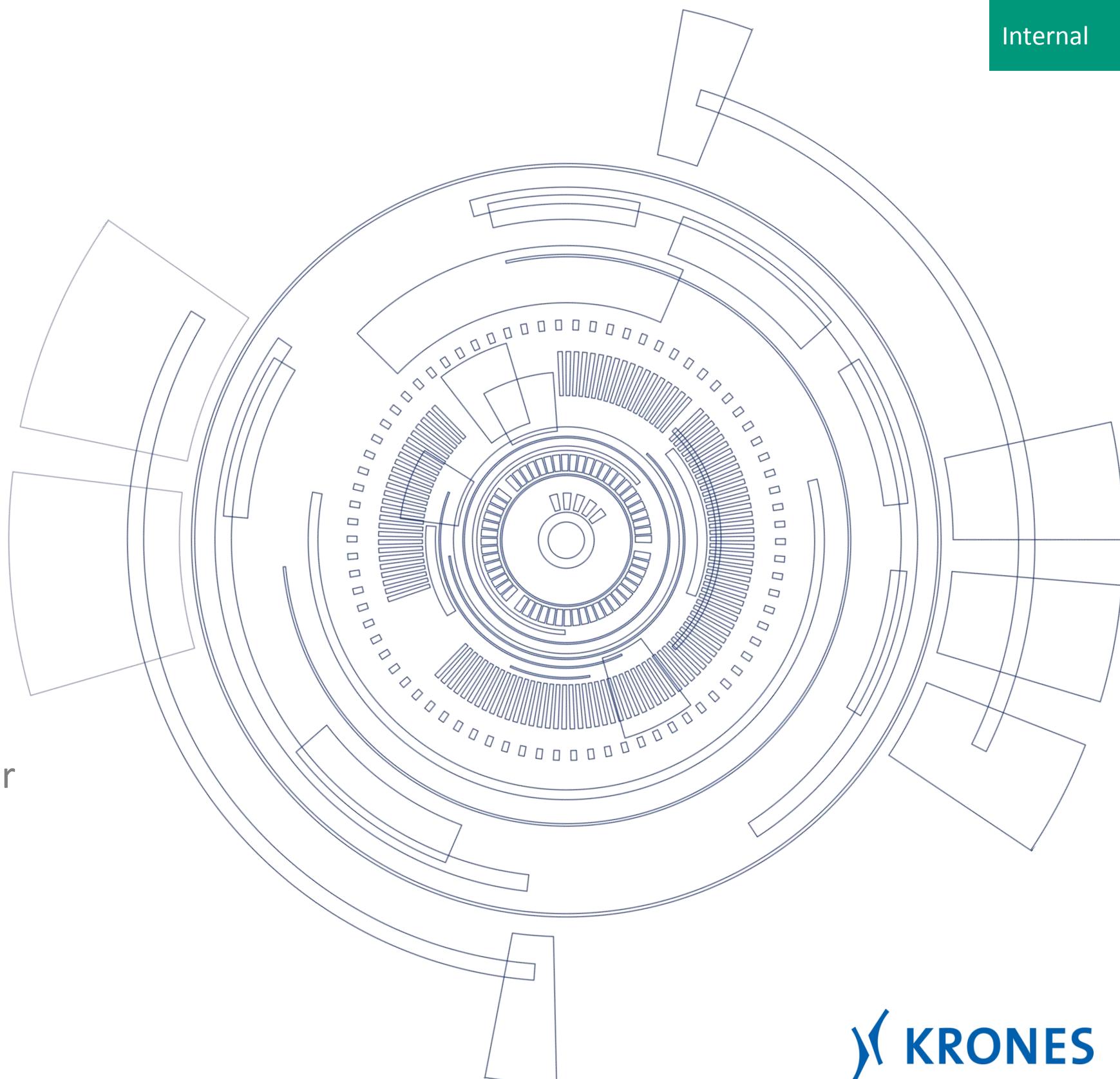
Data visualization with Excel

Day 2

Review and questions

Data visualization with Report Builder

Review, outlook and questions



Look back: KRONES IM data services

KRONES Group

CD

CO

CRM

FI

HR

IM

PLM

QM

SCM

Business Intelligence (BI)

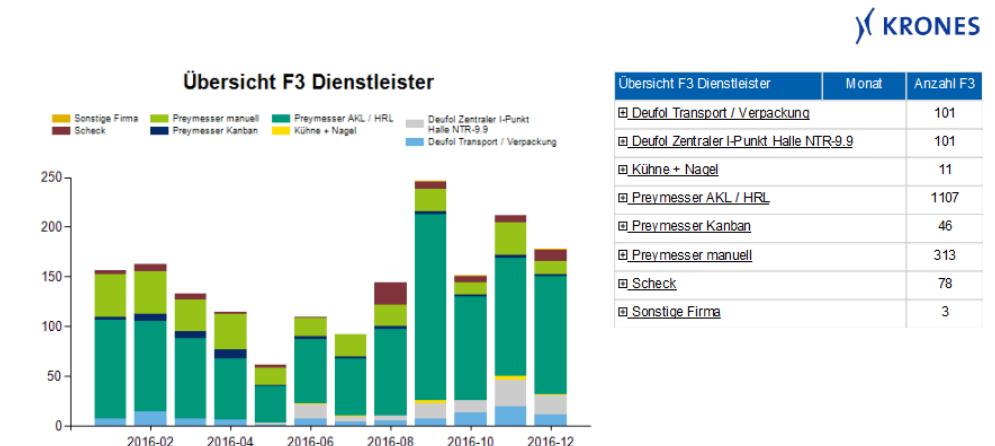
- Decision Support System utilizing enterprise wide key figures
- Provision of historic and current data for analysis

Business Analytics (BA)

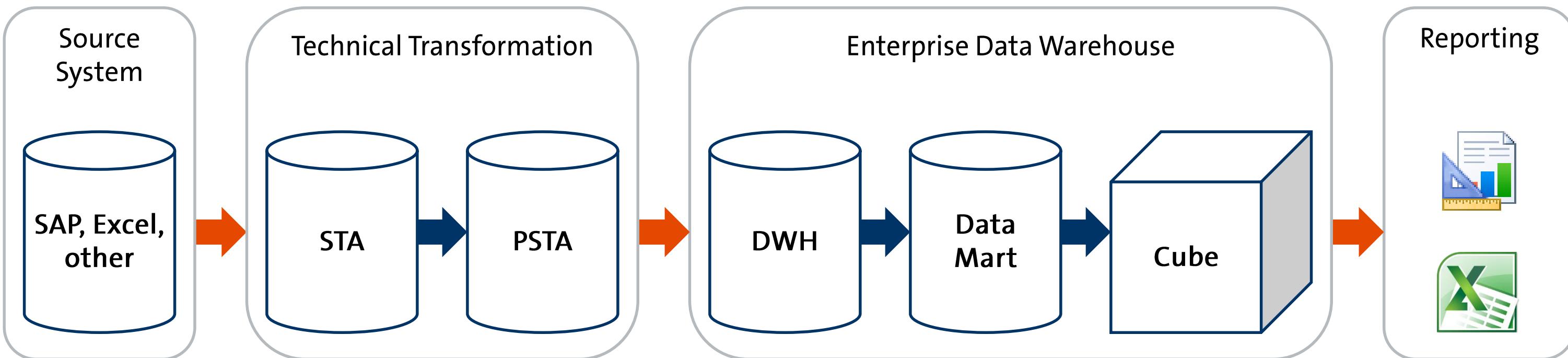
- Adhoc reporting system utilizing internal and external data
- Explorative analysis, forecasts, trend analysis

Services

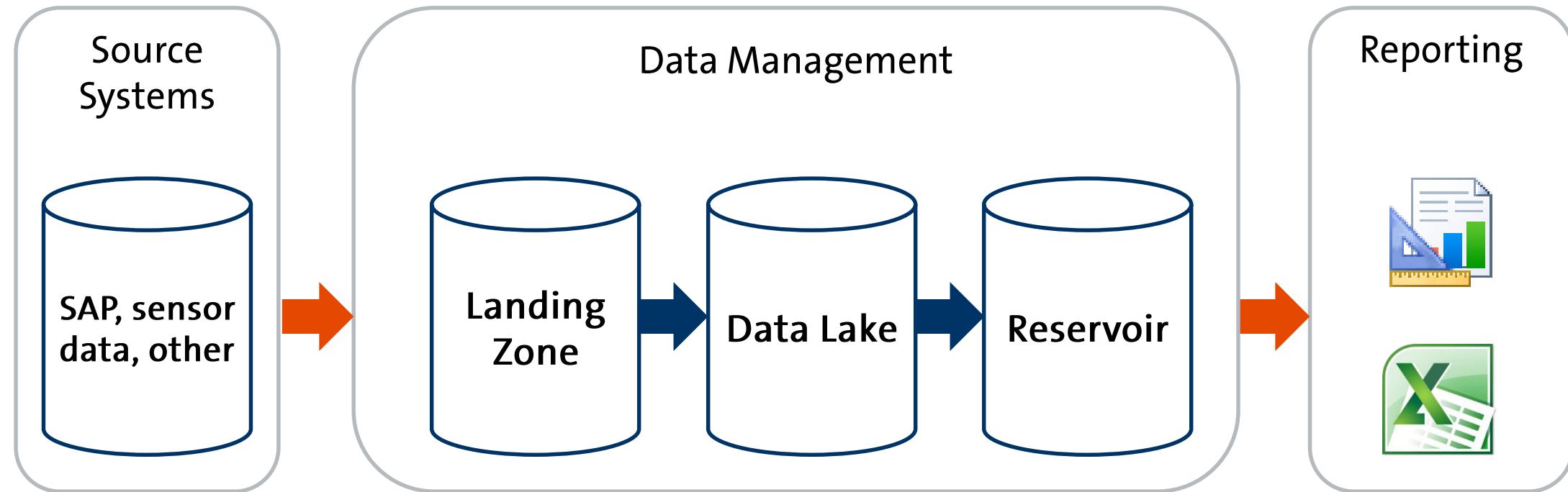
- Systems and visualization training
- Data visualization
- Infrastructure and systems
- User support



Look back: Krones' BI architecture



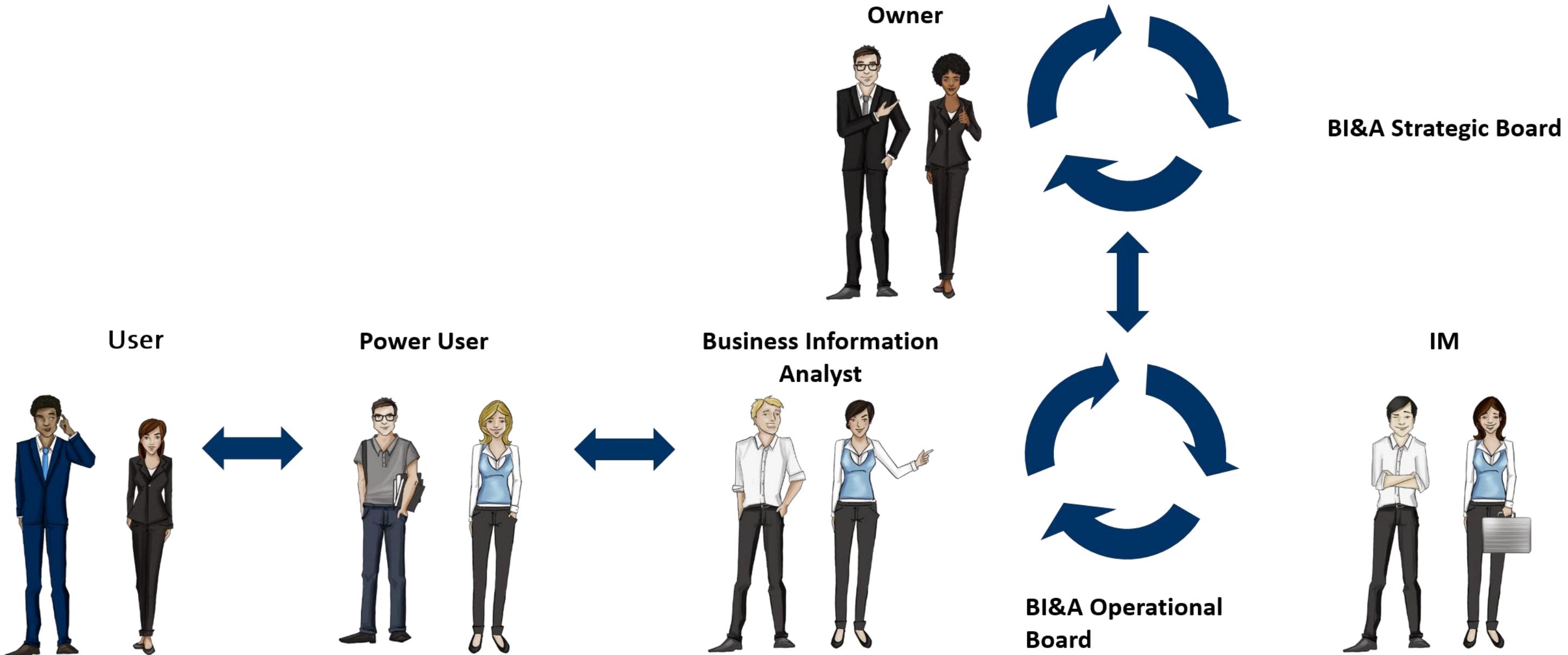
Look back: Krones' BA architecture has three main layers



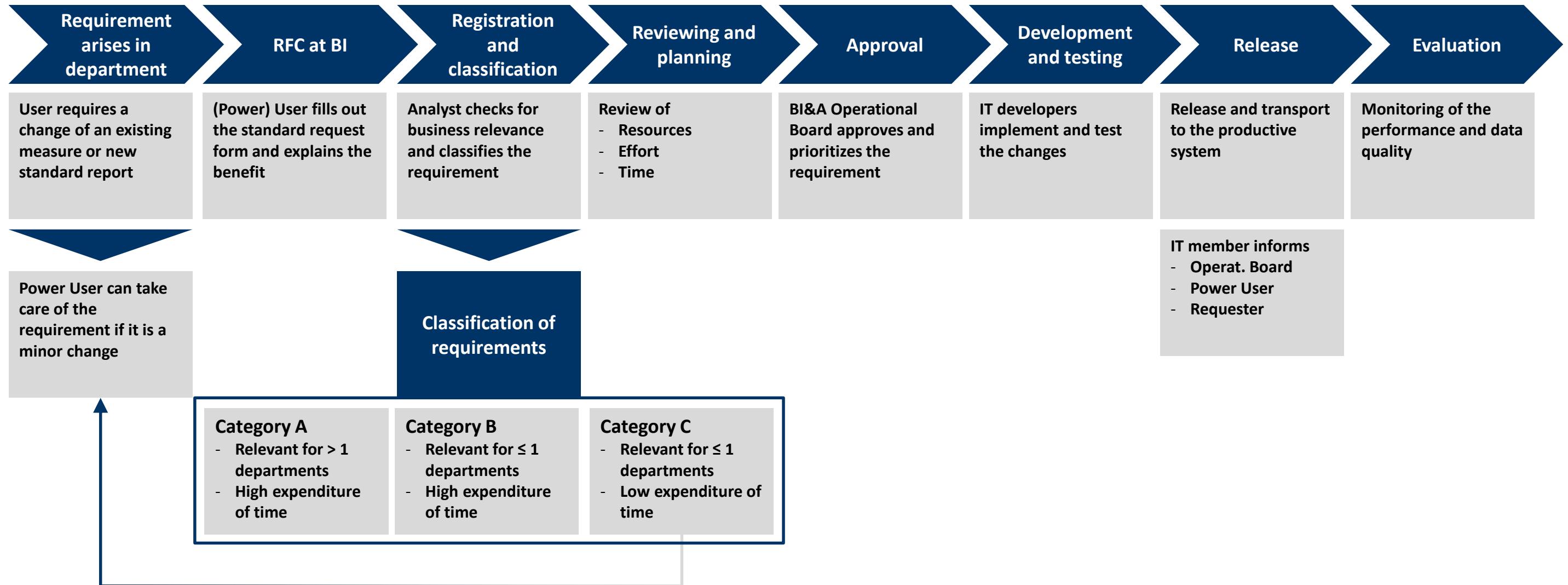
Components of the Analysis Services

- **Database Dimension**
 - Table with only attributes and a primary key
 - Does not hold measures / key figures
- **Database Attribute**
 - Addresses one or more columns of a dimension table
 - Used for slicing the cube
- **Member**
 - The value of a database attribute
 - E.g.: Attribute: Country; Member: Germany
- **Measure**
 - Value of a fact table (key figure)
 - Used for calculations
- **Measure Dimension**
 - Holds all measures of a cube
 - Members are usually aggregated (Sum, Count, Average)
- **Measure Group**
 - Gathers measures in a ‘folder’
- **Calculated member**
 - Member that is being calculated during the query
 - Defined in MDX statements
- **MDX**
 - Short for Multi Dimensional Expression query language
 - Close to SQL but very advanced
 - Only for multidimensional data

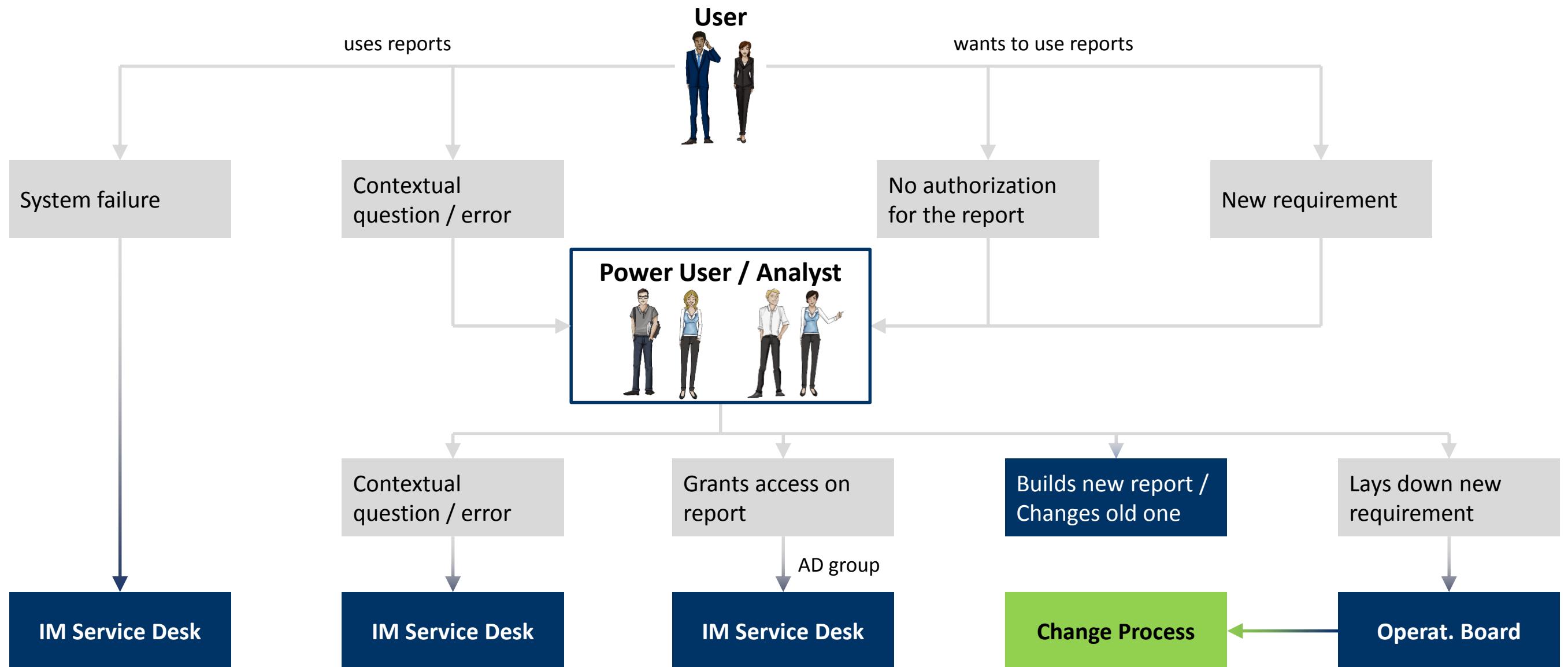
Look back: Roles at Krones BI&A



Requirements have to follow this process



The BI&A support process is aligned with the IT support process at Krones



Day 1

Introduction

Fundamentals

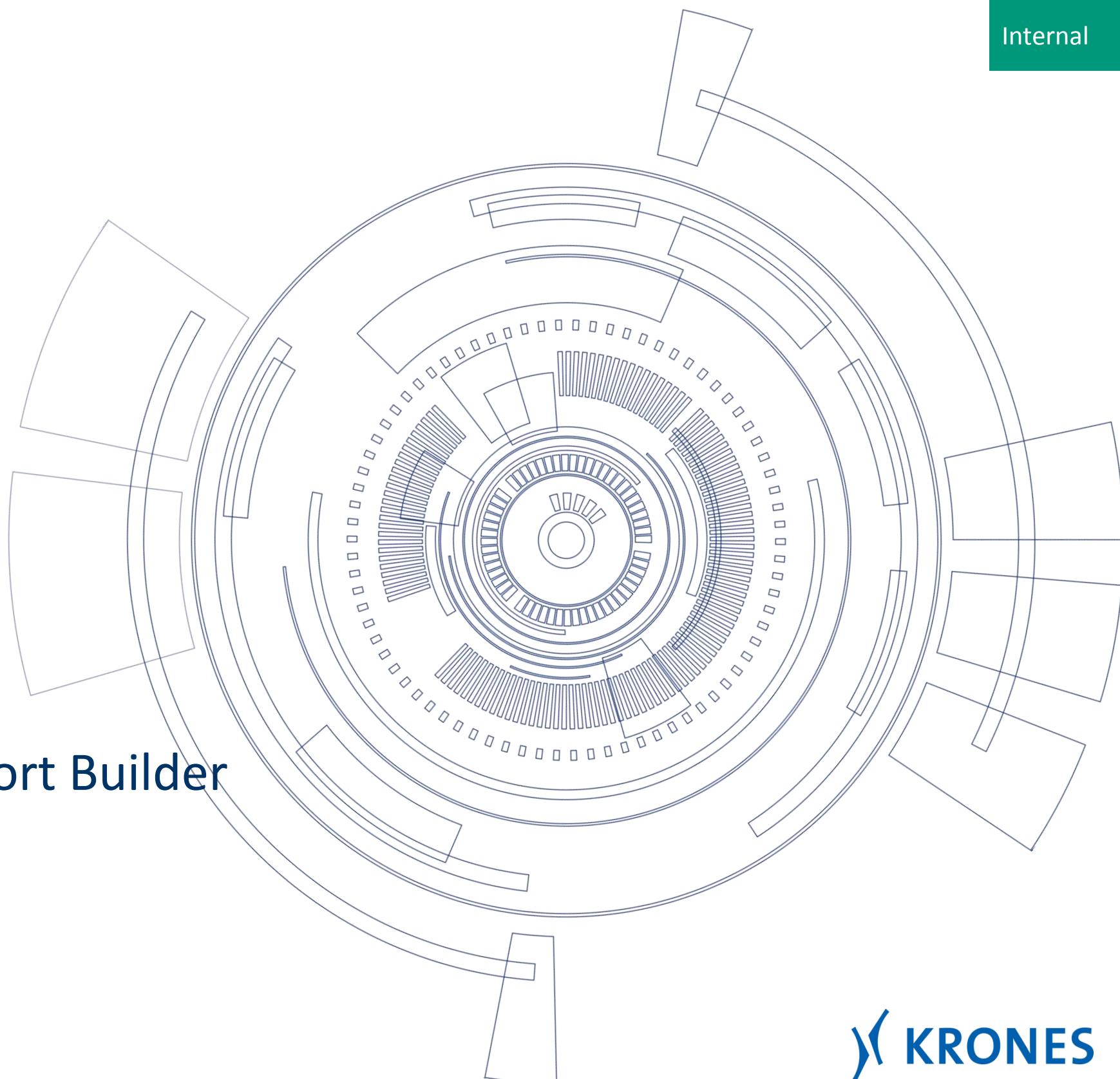
Data visualization with Excel

Day 2

Review and questions

Data visualization with Report Builder

Review, outlook and questions

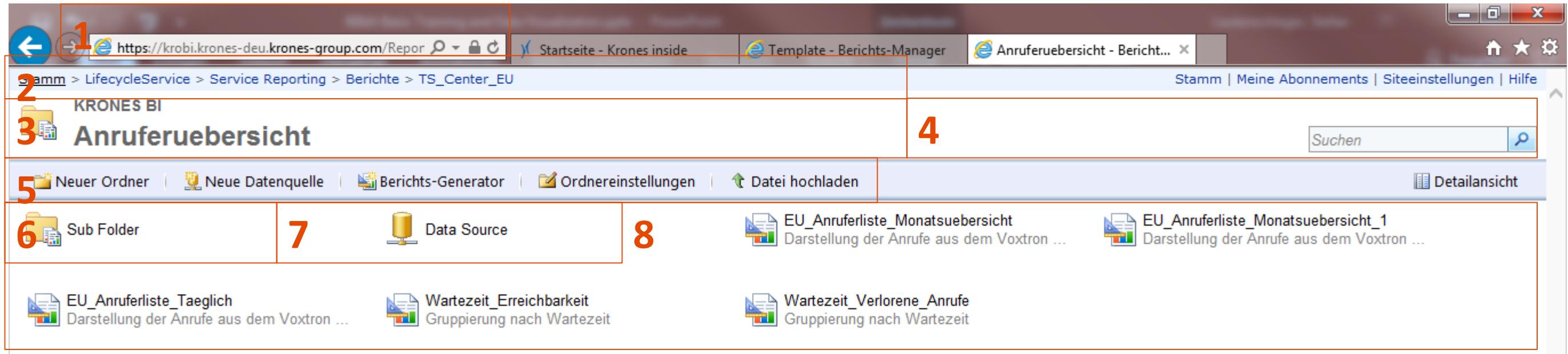


Data viz with ReportBuilder

- **Report Server**
- ReportBuilder & Templates
- DataSource & DataSets
- Tables & Diagrams
- Parameters



Main elements of the report server



- 1) URL, Link
- 2) Path
- 3) Current folder
- 4) Search
- 5) Options, commands
- 6) Sub-folder
- 7) Data source
- 8) Reports

Main elements of a report

The screenshot shows a web browser window with the following elements numbered 1 through 6:

- 1) URL, Link:** The browser's address bar displays the URL: <https://krobi.krones-deu.krones-group.com/Report>.
- 2) Path:** The breadcrumb navigation path is visible at the top of the page: Stamm > LifecycleService > Service Reporting > Berichte > TS_Center_EU > Anruferuebersicht > EU_Anruferliste_Monatsuebersicht.
- 3) Parameters:** Filter controls for Jahr (Year), Monat (Month), Woche (Week), Geschäftszeit (Business Time), Von Datum Lokal.Tag (From Date Local.Time), and An Datum Lokal.Tag (To Date Local.Time).
- 4) Pages:** A navigation bar showing page 1 of 3.
- 5) Title:** The main title of the report is "Anrufe Service Line EU All".
- 6) Content:** A data table showing call statistics for weeks 22 and 23 of 2017. The table includes columns for KW (Week), Tag (Day), Anrufe (Calls), Kurzaufleger (Short Holders), Gespräche (Conversations), Verloren (Lost), and % Erreichbarkeit (Reachability %). The data is summarized at the bottom of each week.

| KW | Tag | Anrufe | Kurzaufleger | Gespräche | Verloren | % Erreichbarkeit |
|------------|--------------|-----------|--------------|-----------|--------------|------------------|
| 2017 KW 22 | 01.06.2017 | 530 | 5 | 506 | 19 | 96,4% |
| | 02.06.2017 | 445 | 6 | 421 | 18 | 96,0% |
| | 03.06.2017 | 124 | 1 | 88 | 35 | 71,8% |
| | 04.06.2017 | 35 | | 31 | 4 | 88,6% |
| | 1.134 | 12 | 1.046 | 76 | 93,3% | |
| 2017 KW 23 | 05.06.2017 | 92 | 1 | 74 | 17 | 81,5% |
| | 06.06.2017 | 570 | 13 | 445 | 112 | 80,4% |
| | 07.06.2017 | 641 | 9 | 551 | 81 | 87,4% |
| | 08.06.2017 | 546 | 7 | 504 | 35 | 93,6% |
| | 09.06.2017 | 475 | 7 | 445 | 23 | 95,2% |

Data viz with ReportBuilder

- Report Server
- **ReportBuilder & Templates**
- DataSource & DataSets
- Tables & Diagrams
- Parameters



Templates are used to ensure a common design

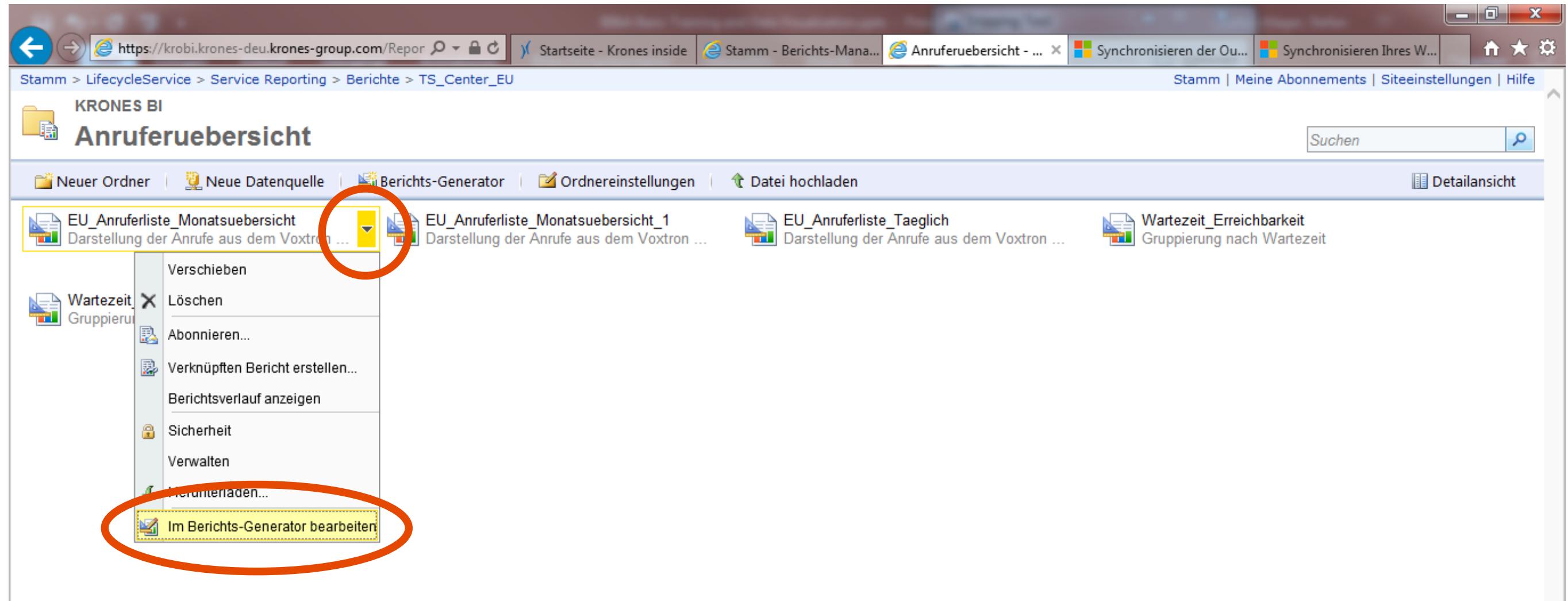
The screenshot shows a Krones report template with various UI elements highlighted by orange boxes and numbered callouts:

- 1** KRONES Logo
- 2, 3** Report title - EN
- 4** Creation data / page# (including file name, creation date, and data state)
- 5** Language parameter (Sprache / Language dropdown set to Englisch (EN))
- Bericht anzeigen** button

Callout numbers correspond to the following list:

- 1) Krones Logo
- 2) Color scheme
- 3) Spacing
- 4) User / Creation data / page#
- 5) Language parameter

How to start ReportBuilder from Server (SSRS 2012 version)



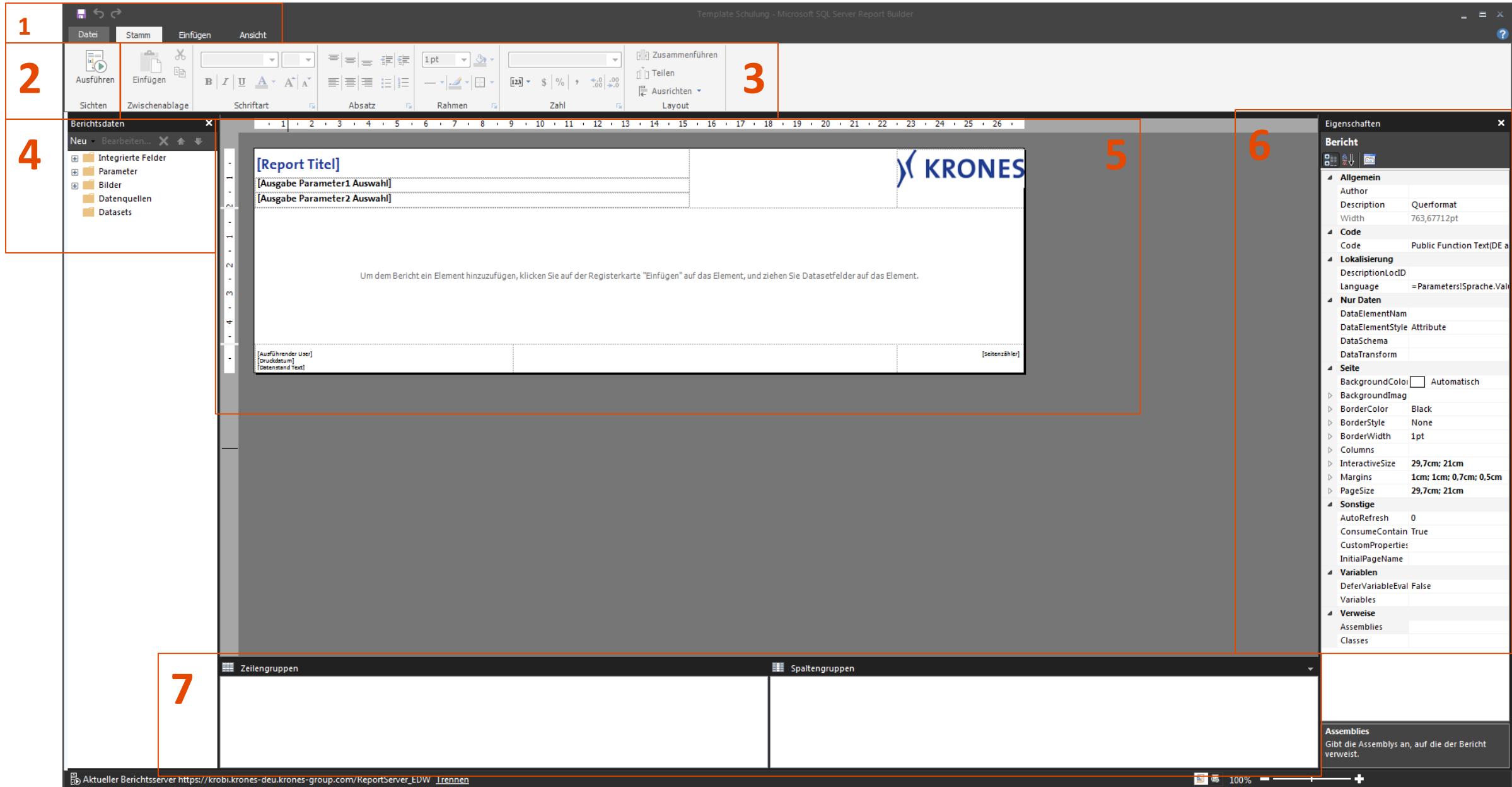
Access the Report Builder on the report server

The screenshot shows the 'Schulung' folder structure in the KRONES Reporting interface. The navigation path is Stamm > LifecycleService > ZZ Vorlagen und Verbindungen > Vorlagen > Schulung. A red box labeled '1' highlights the 'PAGINIERTE BERICHTE (1)' section, which contains a single item: 'Template Schulung'. The 'Training July 17' folder is also visible.

- 1) Find report „Template Schulung“
- 2) Click the ... symbol
- 3) Select „Edit in Report Builder“

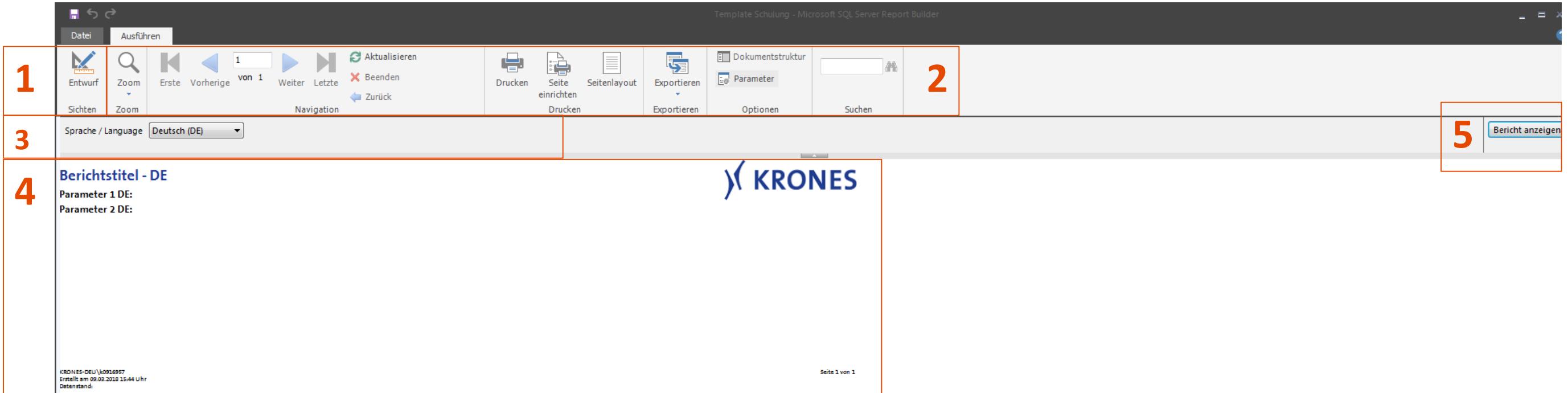
The screenshot shows the context menu for the 'Template Schulung' report. The menu items include: Querformat, Geändert von KRONES-DEU\svc-sql-pbi01-edw am 01.08.17 10:10, Erstellt von KRONES-DEU\svc-sql-pbi01-edw am 01.08.17 10:10, Zu Favoriten hinzufügen, Öffnen (highlighted with a red box), Im Berichts-Generator bearbeiten (highlighted with a red box and labeled '2'), Abonnieren, Verlaufsmomentaufnahmen anzeigen, Herunterladen, Verschieben, Löschen, and Verwalten. A red box labeled '3' highlights the 'Im Berichts-Generator bearbeiten' option.

Getting around the Report Builder: Edit view



- 1) Basic navigation
- 2) Execute / Edit
- 3) Contextual menu
- 4) Creating menu
- 5) Report panel
- 6) Contextual properties
- 7) Row & Column groups

Getting around the Report Builder: Execute view



- 1) Execute / Edit
- 2) Contextual menu
- 3) Parameter section
- 4) Report panel
- 5) Report execution / apply parameter settings

Complete the following steps to
create a report in Report
Builder.



We will complete the following tasks to deepen our understanding

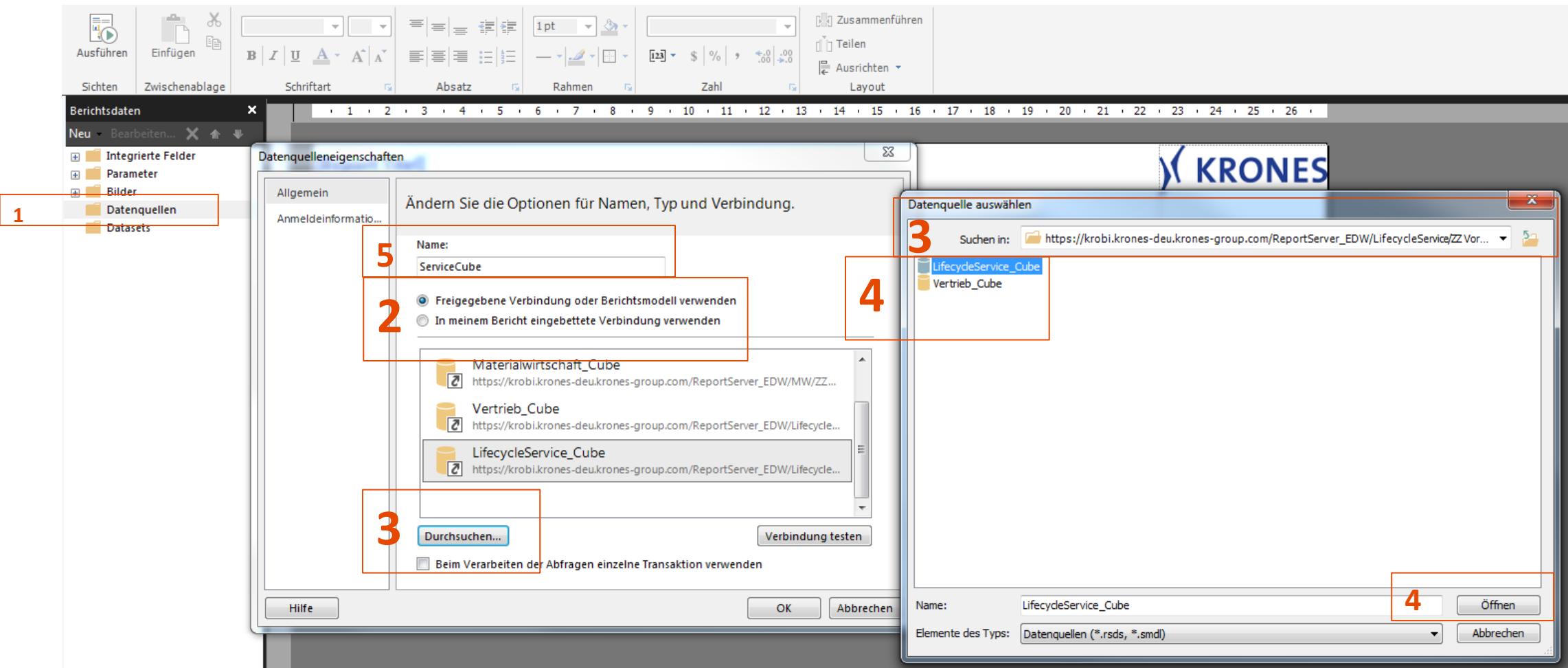
- Objectives to complete
 - Navigate to the test Report Server
 - Navigate to **Stamm > LifecycleService > ZZ Vorlagen und Verbindungen > Vorlagen > Schulung**
 - Open **Template Schulung** in ReportBuilder
 - Save a copy of the report in the respective training folder
- Naming conventions:
 - Stick to English names as international colleagues might use your reports
 - Use “_” instead of spaces (“ ”)
 - Refrain from using “ä”, “ö”, “ü”, “ß”

Data viz with ReportBuilder

- Report Server
- ReportBuilder & Templates
- **DataSource & DataSets**
- Tables & Diagrams
- Parameters

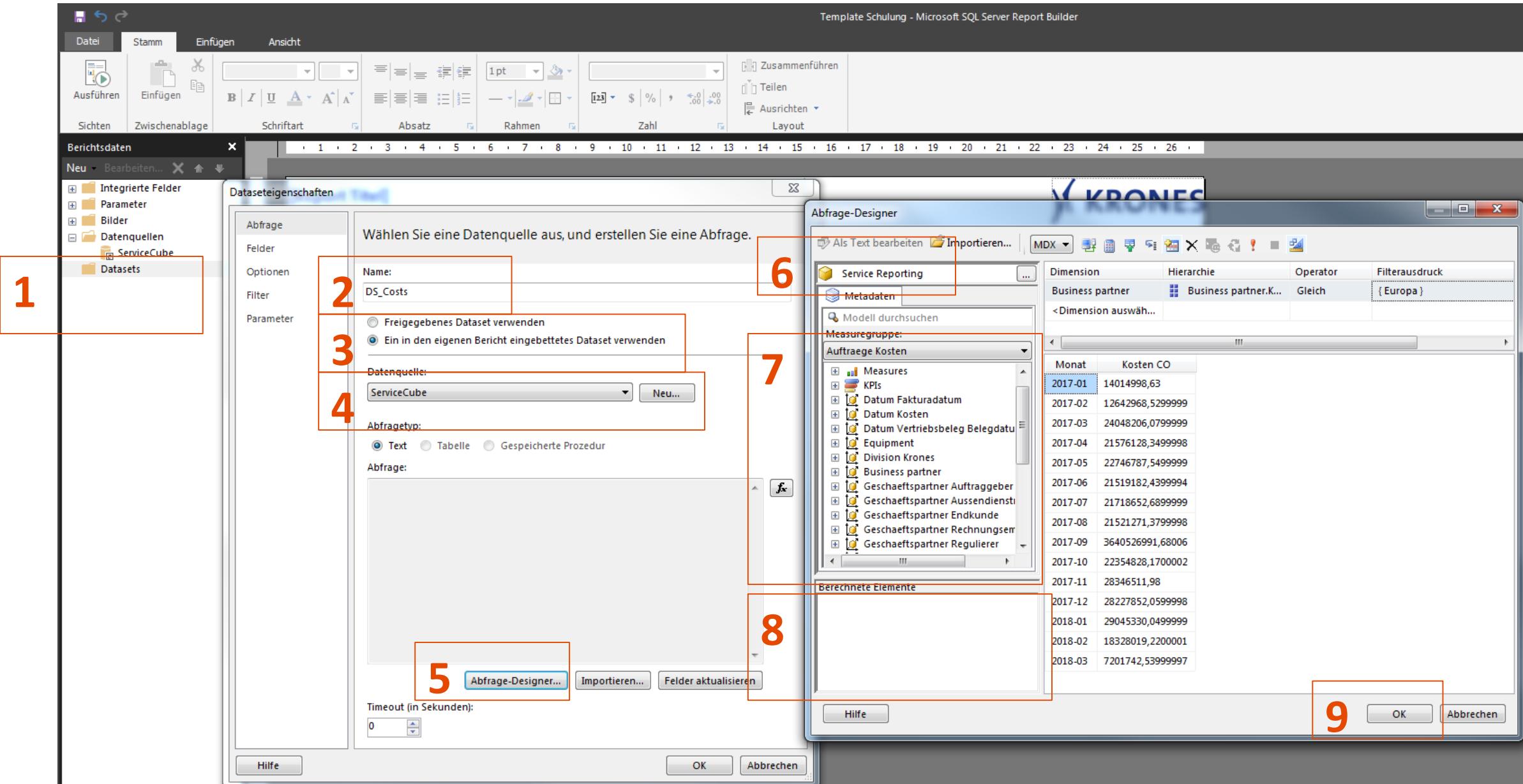


Connect to a data source via the Data Source menu point



- 1) Right click „Data Source“ menu point -> Add data source
- 2) Select the upper option
- 3) Navigate to the cube
- 4) Select the cube
- 5) Rename the data source

Add and edit a data set via the Data Set menu point



- 1) Right click „Data Sets“ menu point
- 2) Rename the DS
- 3) Select the bottom option
- 4) Select the cube
- 5) Start query designer
- 6) Select cube / perspective
- 7) Choose measures and attributes
- 8) Add a calculated member (optional)
- 9) Confirm

Exercise

Complete the following steps to
create a data set in Report
Builder.



We will complete the following tasks to deepen our understanding

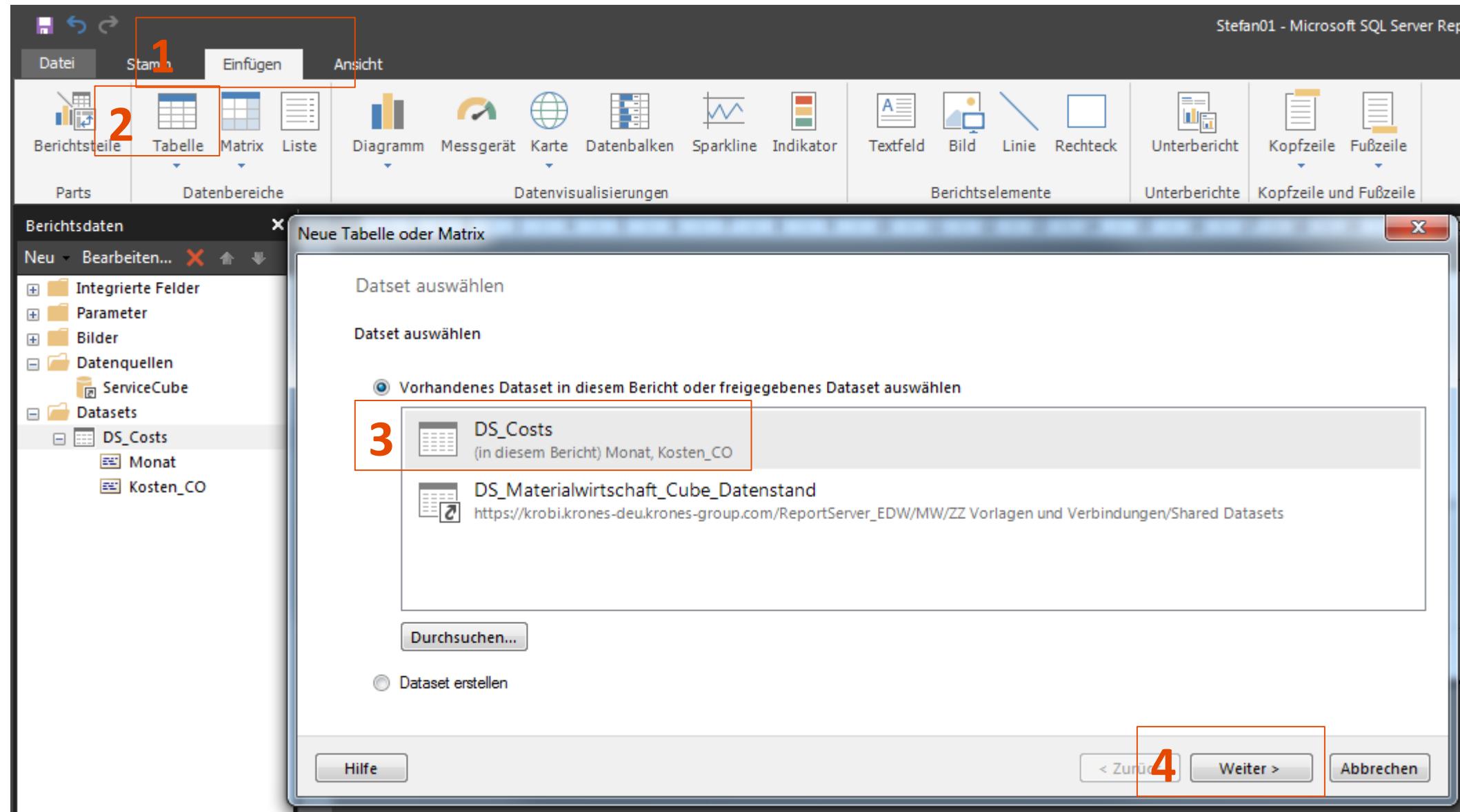
- Objectives to complete
 - Open the report you just saved
 - Add data source **LifecycleService_Cube**
 - **Stamm > LifecycleService > ZZ Vorlagen und Verbindungen > Report Datenquellen > LifecycleService_Cube**
 - Test the connection
 - Add a new dataset
 - Choose the newly added data source
 - Click on Query-Designer
 - Select cube **Service Reporting**
 - Drag in Measure **Kosten CO**
 - Filter for **Business partner.Kontinent Geographisch (Continent Geographical)** = 'Europe'
 - Drag in **Datum Kosten.Monat**
 - Run the query

Data viz with ReportBuilder

- Report Server
- ReportBuilder & Templates
- DataSource & DataSets
- **Tables & Diagrams**
- Parameters

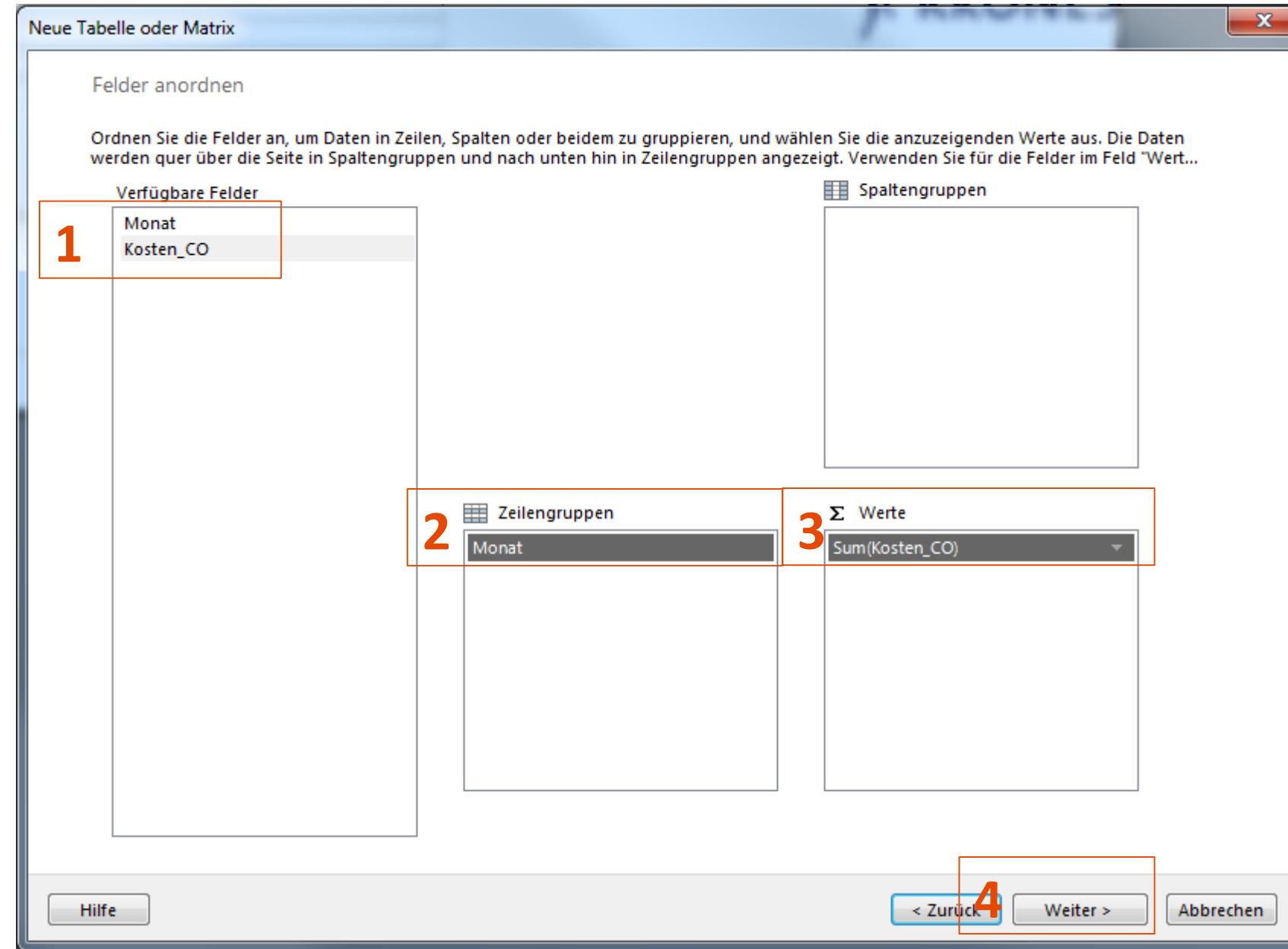


Add a table to your report via the Insert > Table menu point [slide 1/3]



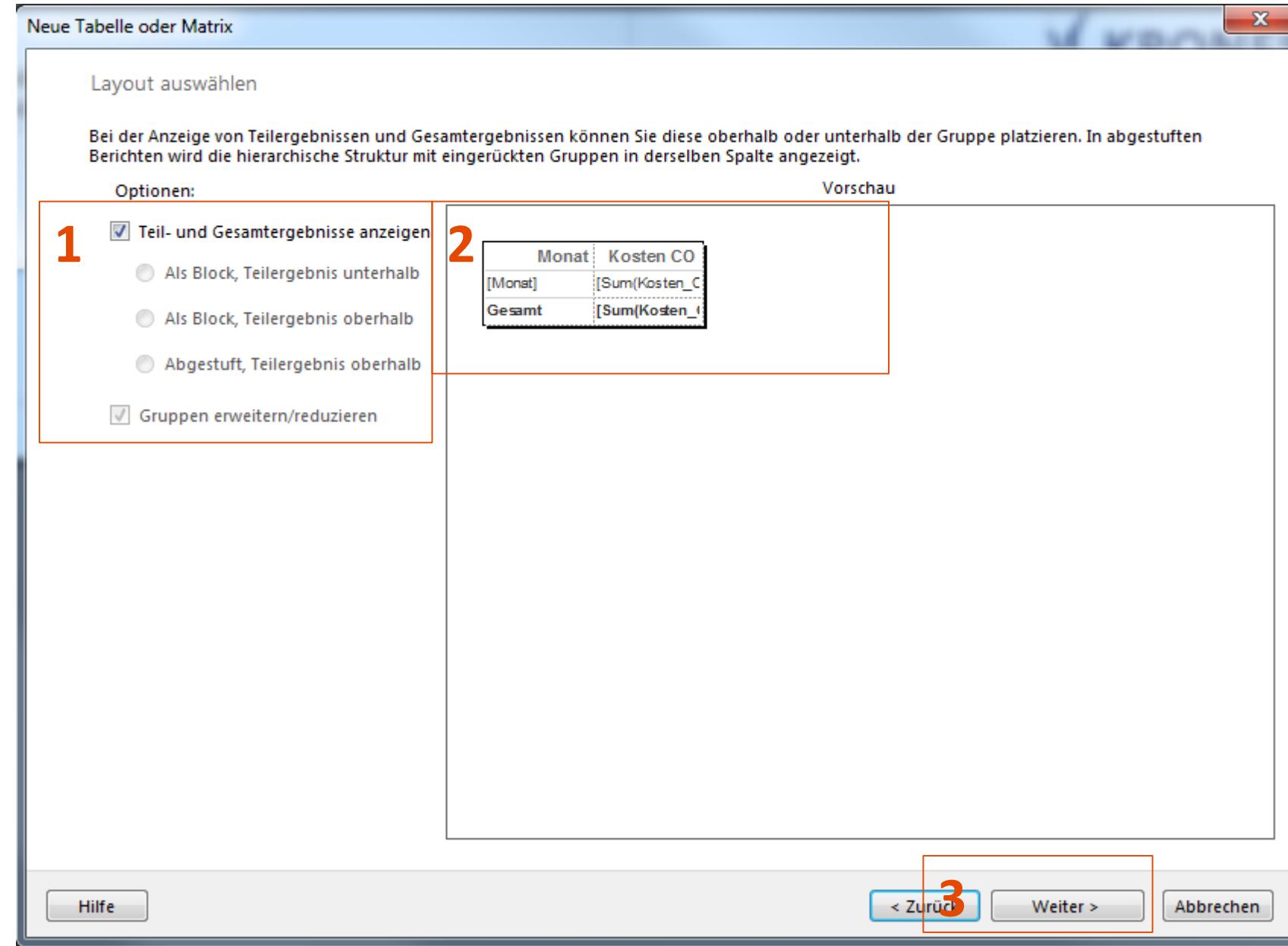
- 1) Switch to „Insert“ menu point
- 2) Select table and insert using the assistant
- 3) Select the Data Set you just created
- 4) Confirm

Add a table to your report via the Insert > Table menu point [slide 2/3]



- 1) Think of which data you want to analyze
- 2) Drag attributes in row / column groups
- 3) Drag measures in values
- 4) Confirm

Add a table to your report via the Insert > Table menu point [slide 3/3]



- 1) Select whether you want to display (sub-)totals
- 2) View results
- 3) Confirm

Execute report to view results

The screenshot shows a reporting application window. On the left, a vertical sidebar labeled '1' contains icons for 'Entwurf' (Design), 'Zoom', 'Erste' (First), 'Vorherige' (Previous), '1 von 1' (1 of 1), and 'Weiter' (Next). Below this is a language selection dropdown 'Sprache / Language' set to 'Deutsch (DE)'. The main area, labeled '2', is titled 'Berichtstitel - DE' and displays a table of data:

| Monat | Kosten CO |
|---------|----------------------|
| 2017-01 | 14014998,63 |
| 2017-02 | 12642968,5299 999 |
| 2017-03 | 24048206,0799 999 |
| 2017-04 | 21576128,3499 998 |
| 2017-05 | 22746787,5499 999 |
| 2017-06 | 21519182,4399 994 |

- 1) Switch to Execute View
- 2) View results

Exercise

What's missing?

Formatting

Parameter does
nothing

How to add new
data?

Diagram

Hierarchy
Year>Month

Where is the region?

Exercise

Complete the aforementioned steps to create a simple table report.

Make improvements to the initial table by adjusting the format and adding new data.

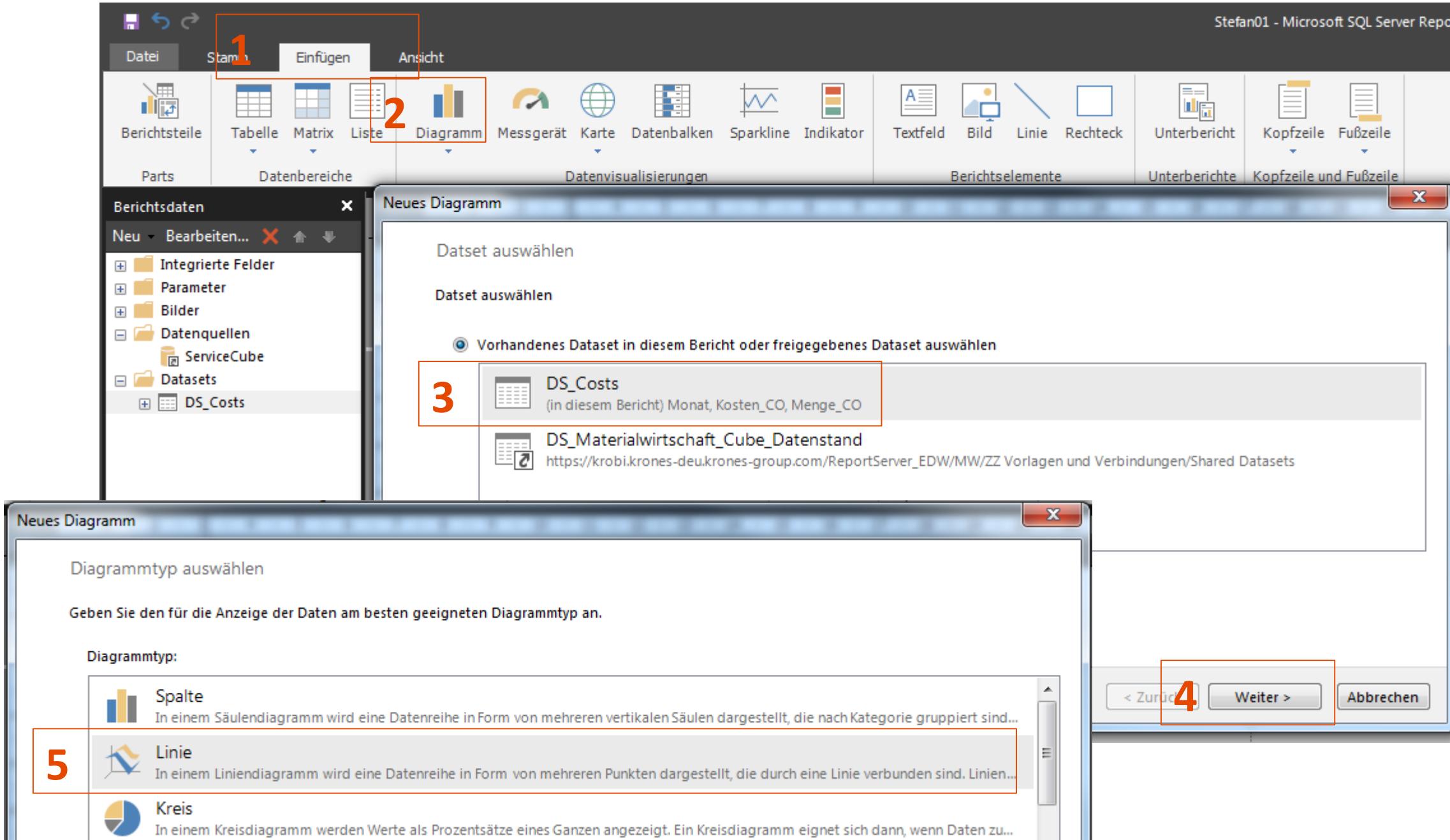


We will complete the following tasks to deepen our understanding

- Adjusting the format
 - Options are available in the contextual properties menu on the right side
 - Be aware that different elements have different properties
- Add more data
 - Open the dataset you referenced
 - Drag new measures or attributes in
 - Confirm
 - Right click a column in the table
 - Add another column
 - Add a measure / attribute in a cell

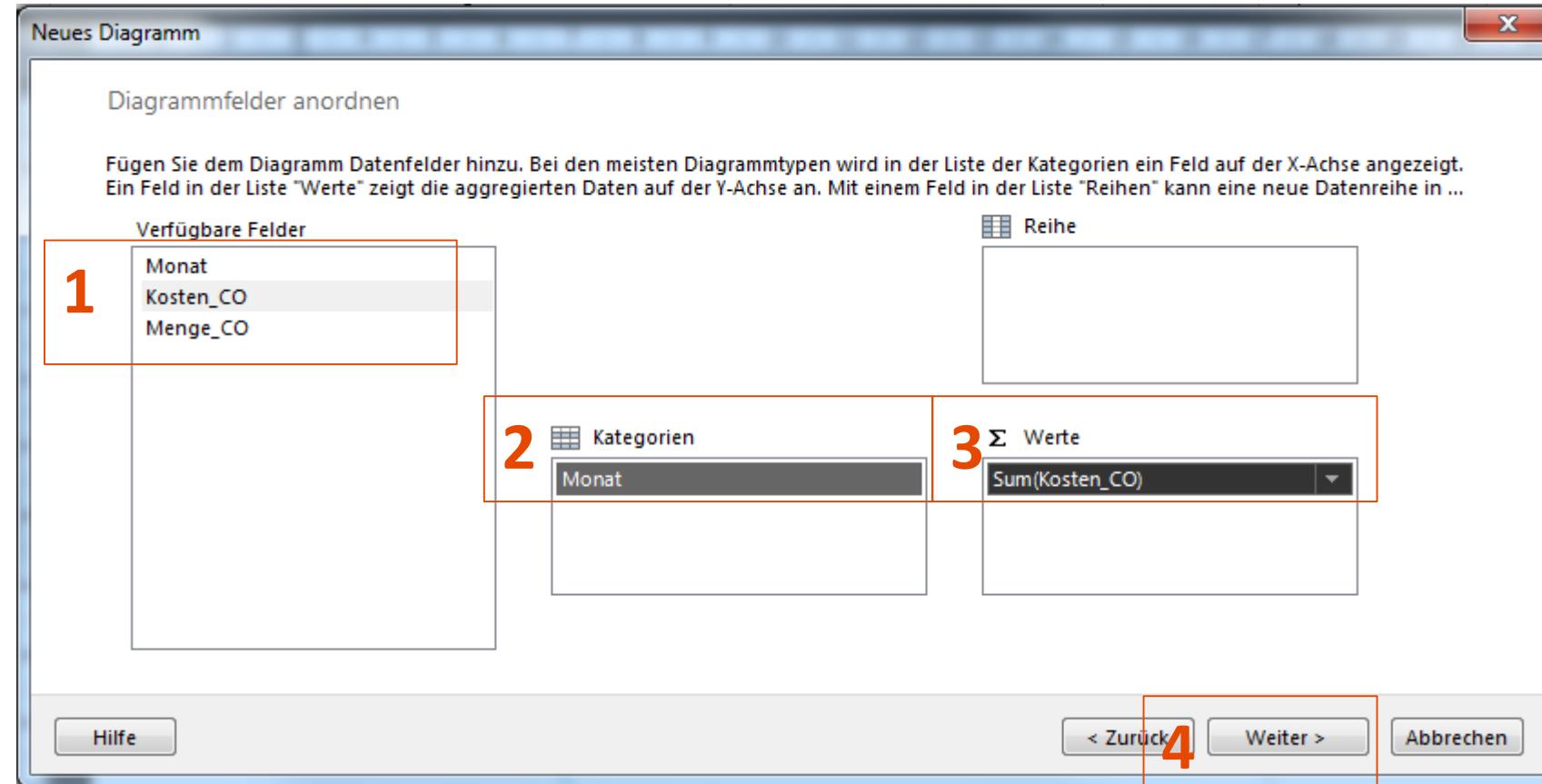
| | Monat | Kosten CO | Menge CO |
|--------|---------|----------------|--------------|
| (| [Monat] | [Sum(Kosten_C) | [Sum(Menge_C |
| Gesamt | | [Sum(Kosten_ | [Sum(Menge_ |

Add a diagram to your report via the Insert > Diagram menu point [slide 1/2]



- 1) Switch to „Insert“ menu point
- 2) Select Diagram and insert using the assistant
- 3) Select the Data Set you just created
- 4) Confirm
- 5) Select the type of graph you wish to use and confirm

Add a diagram to your report via the Insert > Diagram menu point [slide 2/2]

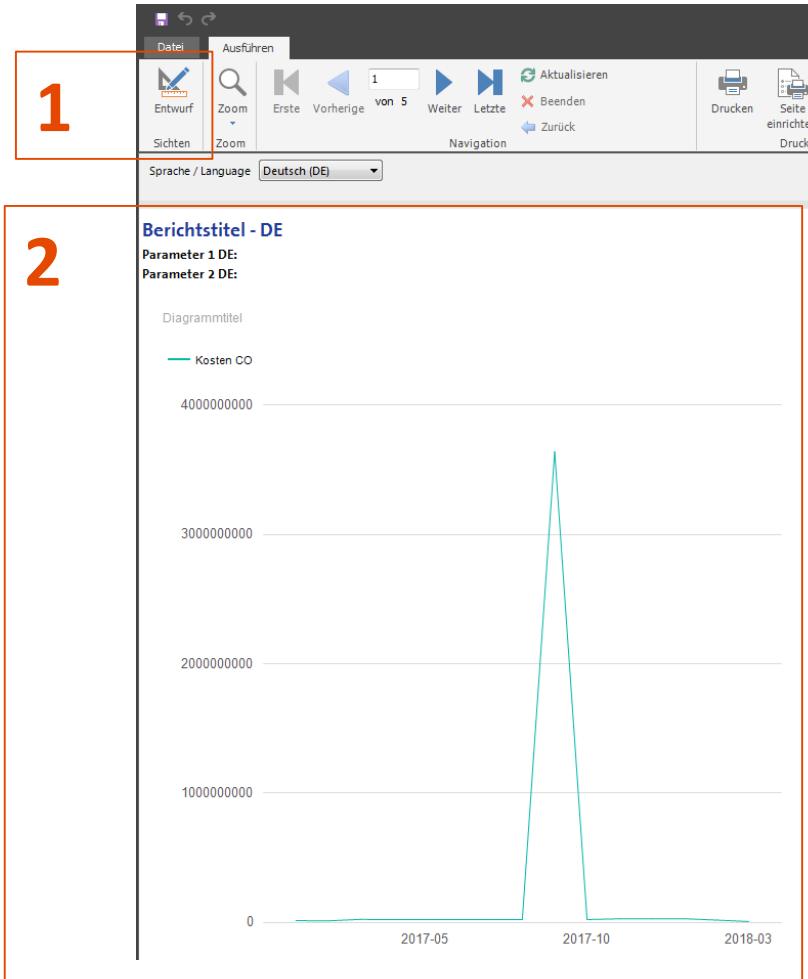


- 1) Think of which data you want to analyze
- 2) Drag attributes into Categories or Rows
- 3) Drag measures in values
- 4) Confirm

Note:

The assistant will scale the diagram's size automatically. You may have to change that manually.

Execute report to view results



- 1) Switch to Execute View
- 2) View results

Exercise

What's missing?

Formatting

Parameter does
nothing

How to add new
data?

Thin / light line

Axis doesn't show
exact month

Where is the region?

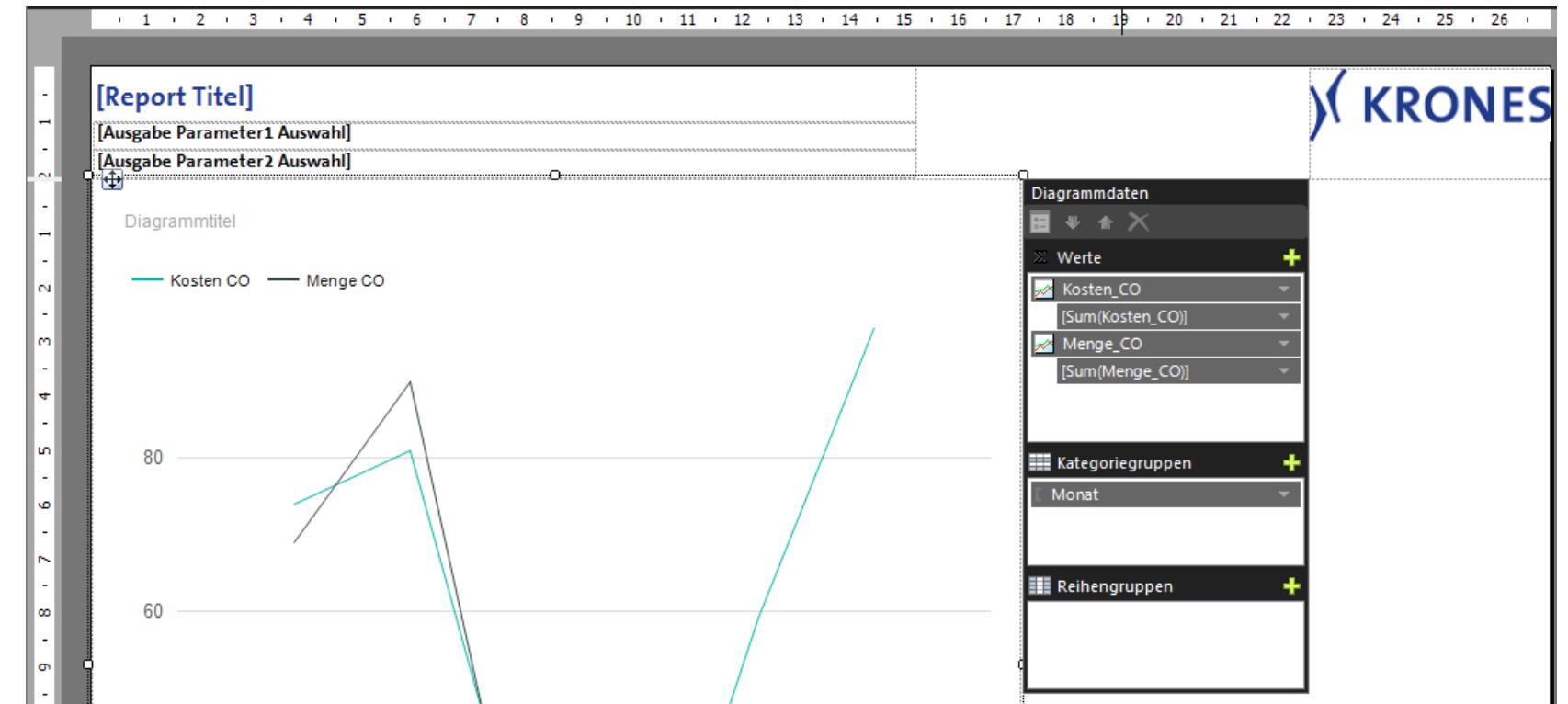
Complete the aforementioned steps to create a simple diagram report.

Make improvements to the initial diagram by adjusting the format and adding new data.



We will complete the following tasks to deepen our understanding

- Adjusting the format
 - Options are available in the contextual properties menu on the right side
 - Be aware that different elements have different properties
- Add more data
 - Open the dataset you referenced
 - Drag new measures or attributes in
 - Confirm
 - Right click the diagram
 - Click the  symbol
 - Select the new measure / attribute

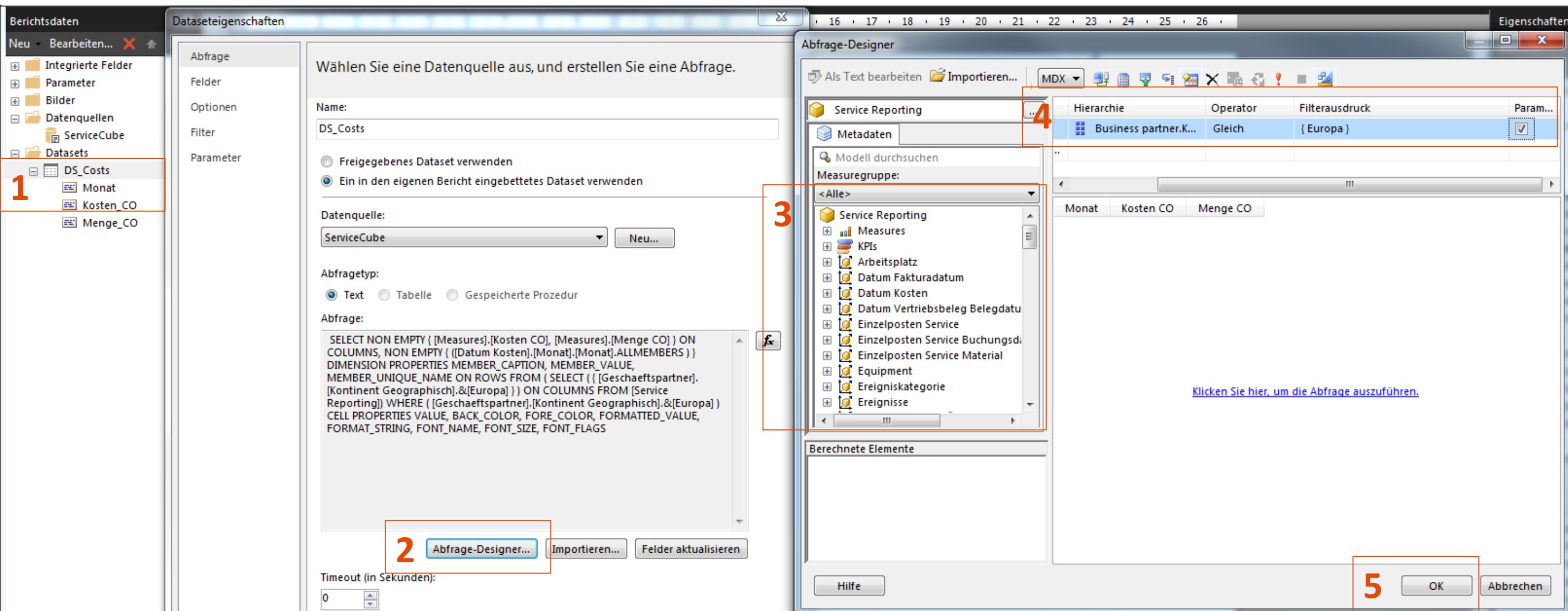


Data viz with ReportBuilder

- Report Server
- ReportBuilder & Templates
- DataSource & DataSets
- Tables & Diagrams
- **Parameters**



Add a parameter via the Data Set menu point



1) Select your data set

2) Access the query designer

3) Select the attribute you want to display as a parameter

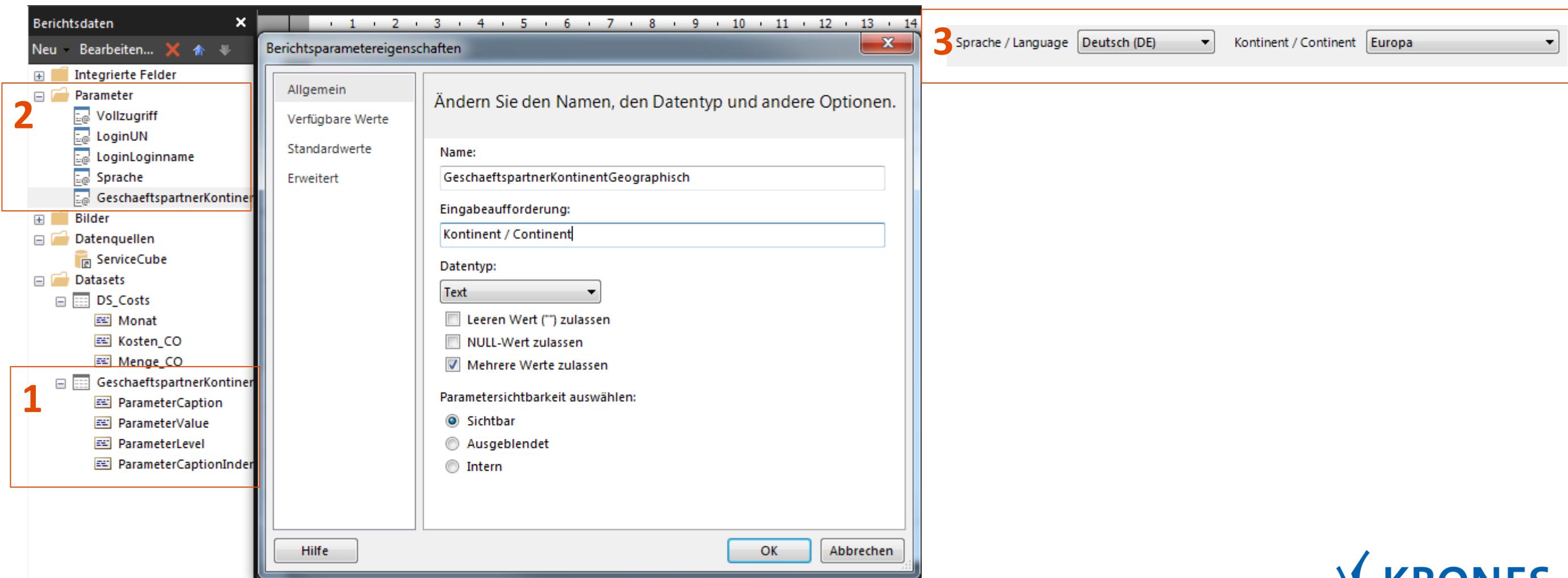
4) Click the checkmark

5) Confirm

Notables about parameters

Note:

- 1) Adding a parameter creates a hidden data set that may slow down execution times
- 2) Parameter properties can be changed in the Parameters menu point
- 3) Parameters will be displayed in the top of the execution view and will give the users navigation options



Exercise

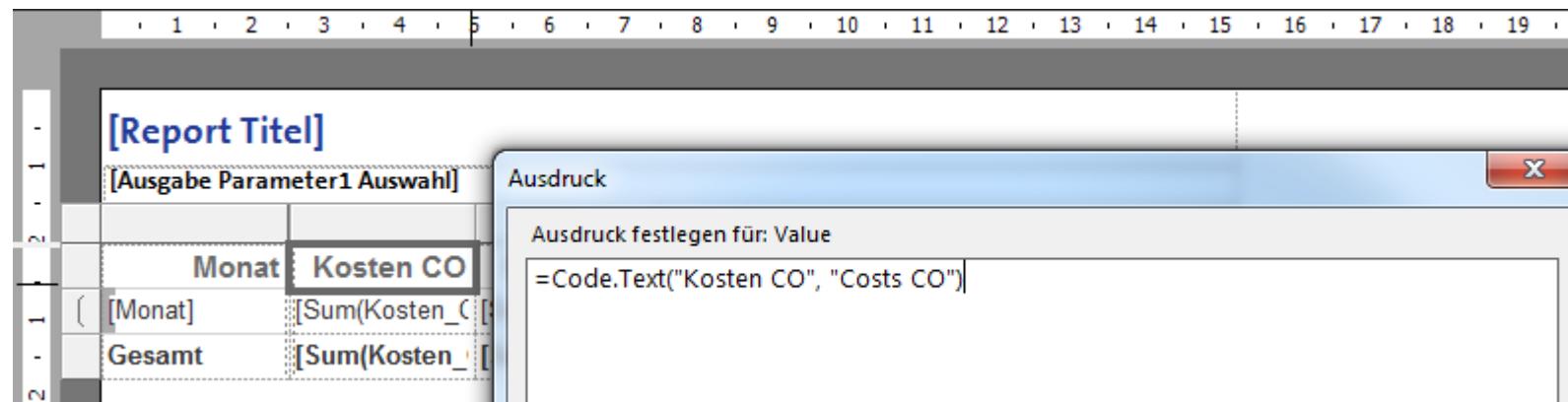
Create a parameter labelled “Continent” and add it to your report.



Language settings can be influenced by the Code.Text function

Note:

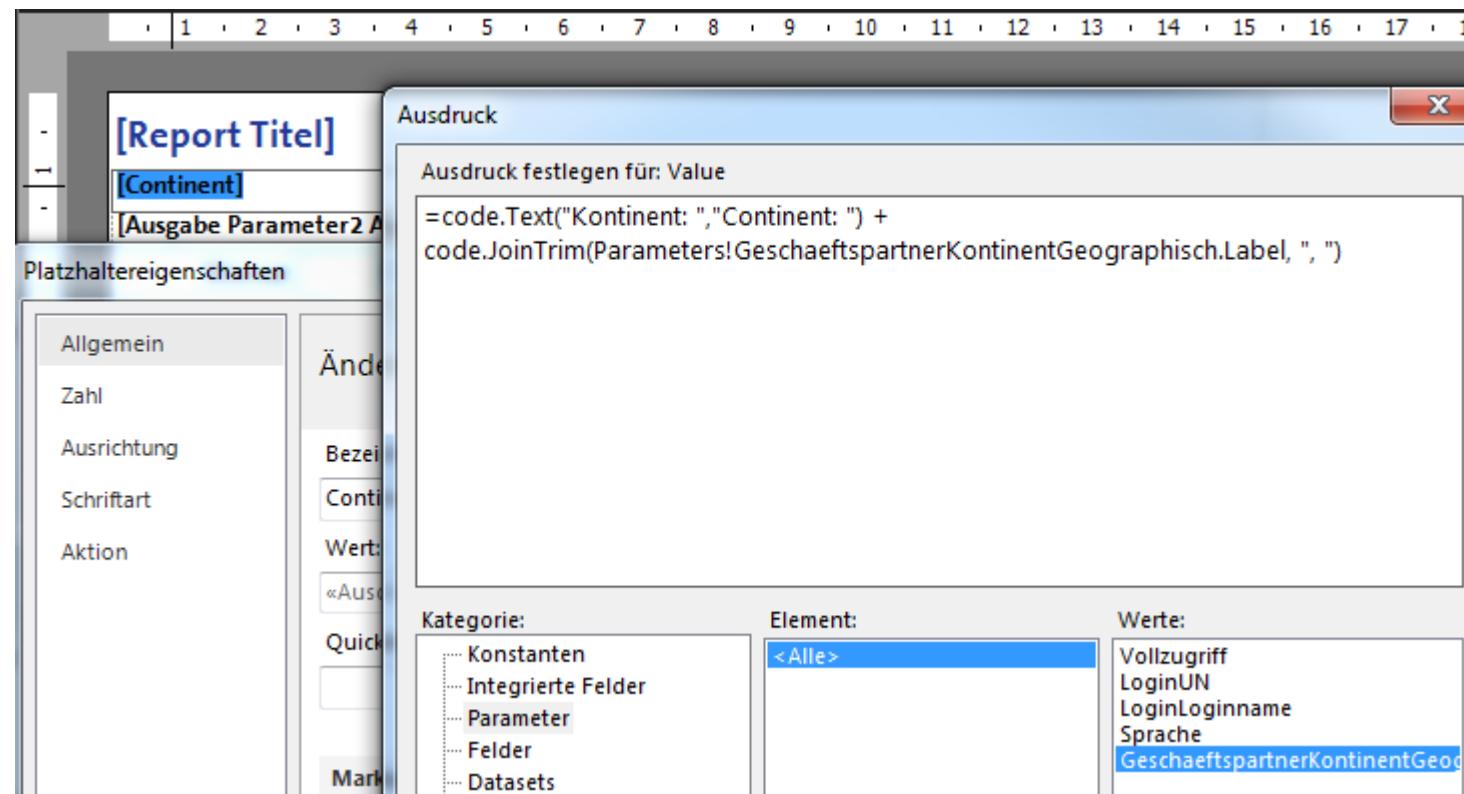
- 1) The language parameter is already included in the template
- 2) You can influence the displayed text by adding the Code.Text function in the value property of a text field
Example: =Code.Text("Deutscher Text", "English text")
- 3) Attributes with German / English texts are automatically displayed in the selected language
- 4) The formatting is **not** influenced by the parameter



Parameter values can be displayed by using the Code.JoinTrim function

Note:

- 1) Functions can be combined. In This case I'm combining code.Text with code.JoinTrim
- 2) Code.JoinTrim(<Parameter>, <Separator>) works on single value and multiple value parameters
Example: =Code.JoinTrim(Parameters!Year, ", ")
- 3) Parameters can be selected below the Expression statement



Exercise

Create translations and add them to your report.

Show the parameter values of your continent parameter in the top of your report.



Day 1

Introduction

Fundamentals

Data visualization with Excel

Day 2

Review and questions

Data visualization with Report Builder

Review, outlook and questions



Free for all!

Add data to your report, change
the formatting, try different
diagram types, change
parameters...



We do more.

Day 2



KRONES

www.krones.com

KIC KRONES

www.kic-krones.com

KOSME

www.kosme.com

KONPLAN

www.konplan.cz

EVOGUARD

www.evoguard.com

SYSKRON

www.syskron.com

HST
KRONES GROUP

www.hst-maschinenbau-gmbh.de

MILKRON

www.milkron.com

Server-Adressen

- Analysis Services
 - Test: SQLAS-T-NTR001\TBIA3
 - Prod: SQLAS-P-NTR001\PBIA3
- Reporting Services
 - Test: [https://krobi-q.krones-deu.krones-group.com/Reports EDW/](https://krobi-q.krones-deu.krones-group.com/Reports_EDW/)
 - Prod: [https://krobi.krones-deu.krones-group.com/Reports EDW/](https://krobi.krones-deu.krones-group.com/Reports_EDW/)