Data visualization and advanced functionalities using SAP Lumira Designer

Track 9:
Analytics & Data Warehousing in der Lehre

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Agenda

1	Data visualization
2	SAP Lumira Designer: Reusage of components
3	SAP Lumira Designer: Collaboration within reports

Introduction and Definitions

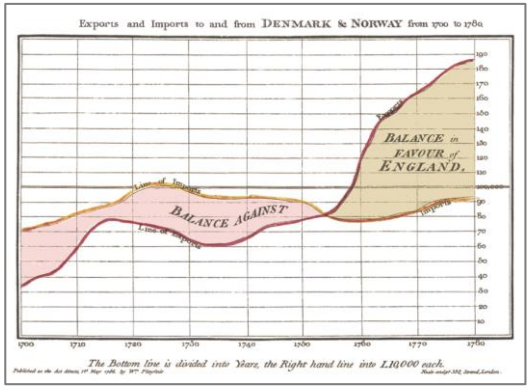
- Data visualization is a collection of methods that use visual representations to **explore**, **make sense of**, and **communicate** quantitative data" (Few, 2017).

- "Data visualization is the process of helping people understand **patterns**, **trends**, and **insights** by transforming data into a visual context" (Ephrati, 2017).

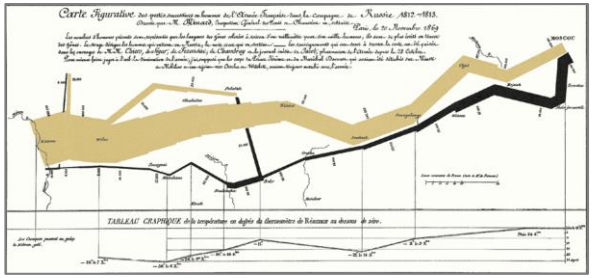
- "Data visualization **displays data** about newly discovered **relationships** that can predicts the outcome" (Watson, 2017).

- "Data visualization is the presentation of quantitative information in a **graphical form**. In other words, data visualizations turn large and small **datasets** into **visuals** that are easier for the human brain to understand and process" (Tryfanava, 2017)

History of data visualization



Playfair's trade-balance time-series chart, published in his *Commercial and Political Atlas*, 1786. Image Source: (Playfair et al. 2005)



Napolean's March. Image Source: https://www.edwardtufte.com/tufte/minard

- The concept of using pictures to understand data has been around for centuries, from maps and graphs in the 17th century to the invention of the pie chart in the early 1800s.
- William Playfair invented several types of diagrams (e.g. line, area, bar chart) in 1786 in order to present quantitative data to king Louis XVI (Playfair et al. 2005).
- Napoleon – „ A good sketch is better than a long speech“ (Sviokla, 2012).
- Charles Joseph Minard statistical graph of Napolean‘s March invasion of Russia (Tufte & Finley, 2002).
- Edward Tufte (1983) – The concept of the visual display of quantitative information is composed of in-depth ideas that initiate design choice and options for statistical graphics standards/practices (Tufte, 1983).

Why data visualization is important

- communicate **complex information** in a way that is easier to interpret by turning information into visually engaging images and stories and enables to feature most important and relevant conclusions (Wesley, 2018).
- influences the visual system to move a **huge amount** of information **very quickly** into the **brain**. It helps to identify **sub-problems** (Steele and Iliinsky, 2011).
- is important in **effective decision making** and **meaningful storytelling**. Four principles to state the importance of data visualization (Infogram Inc., 2016):
    - Make data uncomplicated to **understand** and **remember** it.
    - Determine **unknown** facts, exceptions and trends.
    - Visualize **relationships** and patterns instantly.
    - Ask better **questions** to make better **decisions**.

Why data visualization is important

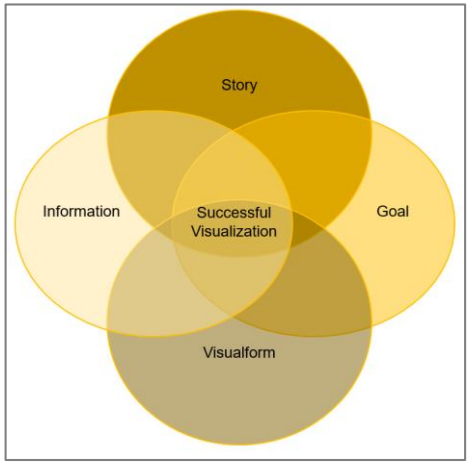
- **Discover** or **identify chances** which are unrecognized (Steele and Iliinsky, 2011).
- Tells a **visual data story** by presenting numbers and facts (Steele and Iliinsky, 2011).
- Human brain is hooked up with visual function and **major percentage** of the infomation **transferred** to brain is **visual** (Steele and Iliinsky, 2011).
- Wise investment in **Big Data** future. (Samuel 2017)
- "Data visualization is going to change the way our analysts work with data. They're going to be expected to respond to issues **more rapidly**. And they'll need to be able to dig for **more insights** – look at data differently, **more imaginatively**. Data visualization will promote that **creative data exploration**". (Samuel 2017)

What makes a successful/good data visualization ?

A Successful visualization comprises of four important components and a combination of all these four components leads to a good visualization:

- **Information** is the dataset that is to be analyzed
- **Story** is the concept to understand the content visually
- **Goal** is a function or clear aim
- **Visual form** which is choosing a right charts and colors
  - For example visualizing in simple text, chart like Heatmap to show data in live presentation, Layered bar charts
  - Use **color intentionally**

→ **Simplify** the visualization as much as pos without reducing the displayed relations!
(see also Bertin 1974)



What makes good data visualization? Source: Modified picture of David McCandless
https://informationisbeautiful.net/visualizations/what-makes-a-good-data-visualization/

What makes a successful/good data visualization ?

Selecting right chart for different visualization purposes

Visualization Goal	Description	Suggested chart in SAP Lumira
Change over time	Used to show, how a measure the changes in the measures over time period	- Bar chart, - Line chart
Comparison	Used to compare the categorical values	- Bar chart, - Trellis
Ranking	Used to show top or bottom "N" measure values	- Bar chart
Part-To-Whole	Used to show the categories that contribute to the whole value	- Bar chart, - Stacked Bar, - Pie chart
Distribution	Used to show how measure are distributed across its area	- Column chart, - Scatter Plot, - Box Plot, - Heat Map
Correlation	Used to show specific correlation between the measures	- Scatter Plot, - Bubble chart, - Trellis
Overview	Overview of the data is showed in a table format	- Table
Geographical Information and Maps	Used to show the geographical distribution of measures	- Cholopleth chart, - Geo Bubble chart

Source: Own creation based on "SAP Lumira Data Visualization Handbook" (SAP SE)

What makes a successful/good data visualization ?

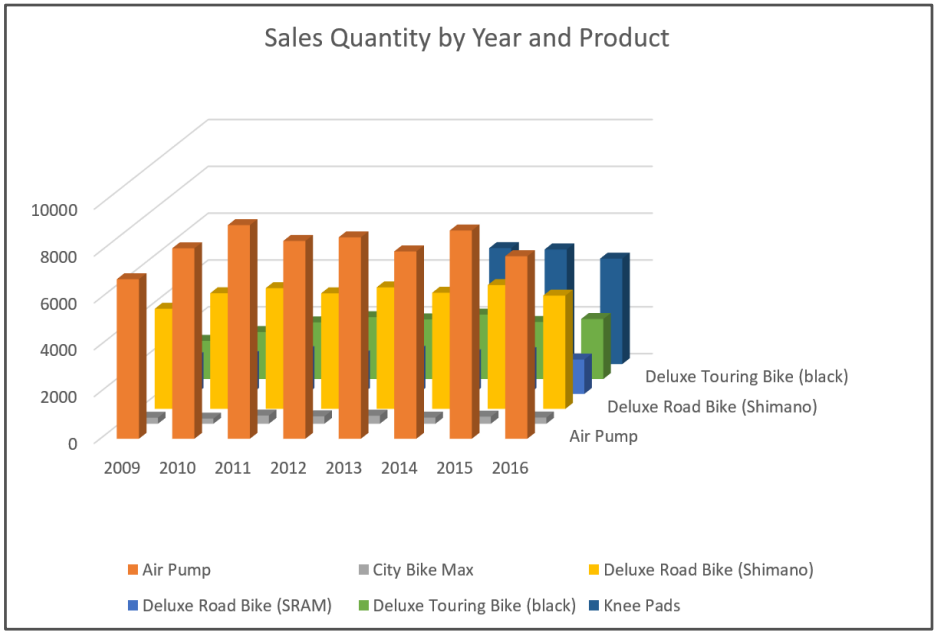
Selecting right chart for different visualization purposes

Additional charts in SAP Lumira	Description
 - Tag Cloud	Used to visualize the text data. The size and color of the text reflect based on the measures
 - Radar chart	Used in comparison of the categorical values
 - Network chart	Used to visualize the specific correlation of the categorical values
 - Funnel chart	Used to visualize the percentage of the categorical values
 - Parallel Coordinates chart	Used to compare multiple measures of the same category
 - Tree chart	Used to visualize the hierarchical relationship between the categorical values
 - Tree Map	Used to visualize the distribution of hierarchical data
 - Numeric Point	Used to visualize an important key figure
 - Stacked Area chart	Used to visualize cumulative totals
 - Waterfall chart	Used to visualize the cumulative effect of sequential data

Source: Own creation based on "SAP Lumira Data Visualization Handbook" (SAP SE)

Example of Bad Visualization

- The example for bad visualization depicted in the screenshot is a 3D bar chart to visualize the sales quantity of the products based on the year.
- It is very hard to understand the quantity of products sold per year, as some data is hiding for few products for example yellow, green and blue bars and it is hard to recognize the quantity sold.

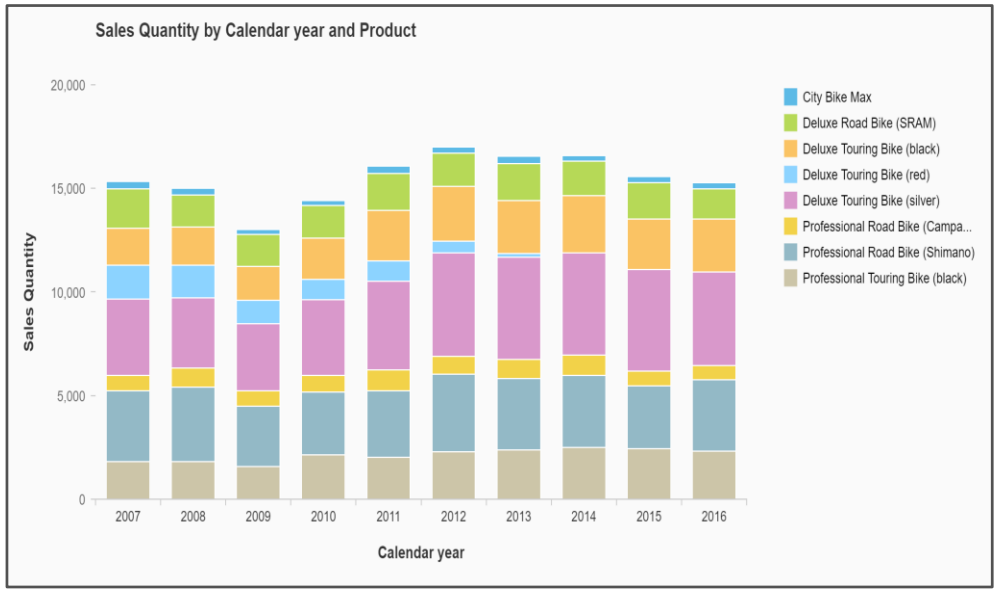


Bad visualization Example

Source: Own creation

Example of Good Visualization

- In the example stated in the screenshot, a stacked bar chart visualization is created to show sales quantity of products based on calendar year and product.
- The data used in this example is somewhat similar to the data of bad visualization example.
- From the stacked bar chart it is easy to identify the products sales quantity by the year based on their colors



Good data visualization Example

Source: Own application

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3	SAP Lumira Designer: Collaboration within reports

Composites: What are they?

- Composites are modular, reusable „app“ blocks that can be plugged into other apps just called as app within app
- With composites, Lumira Designer enables the creation of shared UI elements (such as headers, footers, toolbars), and the breaking down of complex applications into smaller, more manageable parts
- Applications can use composites from the same document and other documents. To use composites from another document, the referenced document must already exist
- One composite can be part of multiple applications. One application can contain multiple composites. Composites cannot contain other composites
- Re-usable across applications, stored on the BI platform

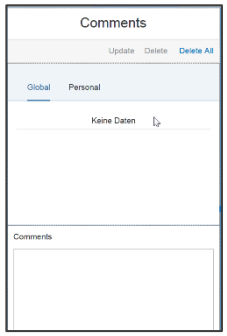
Different forms

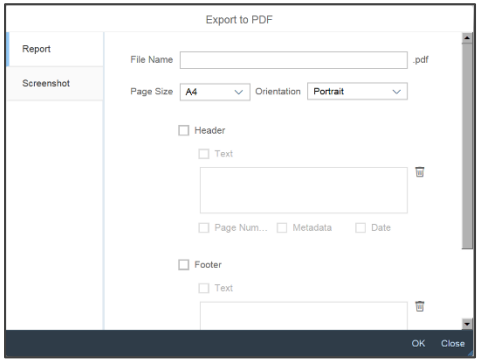
- Composites includes:
  - Application header
  - Cards/tiles
  - Comments panel
  - Export to PDF dialog
  - Bookmark dialog
  - Comments dialog

Header

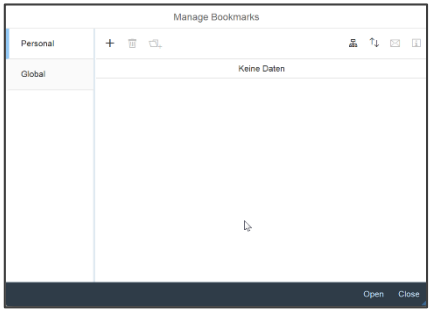
KPI TILE

Comment Panel

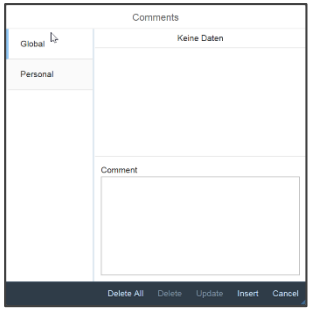




PDF Dialog



Bookmarks Dialog

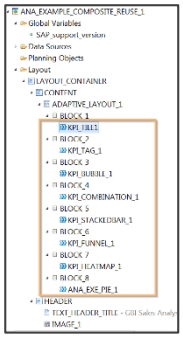


Comment Dialog

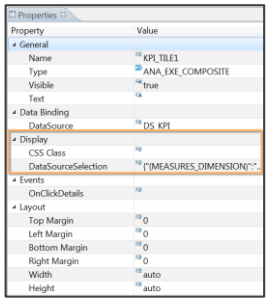
How to reuse a composite in applications

- Composites are visible in the Components view, as other standard SAP components
- Add composites to the application from the Components view, Documents view, or Outline view
- Interface properties, events, functions etc. can be edited in applications

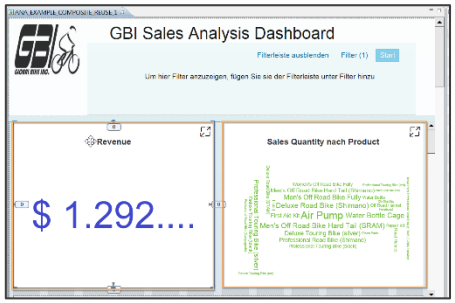
KPI TILE composites

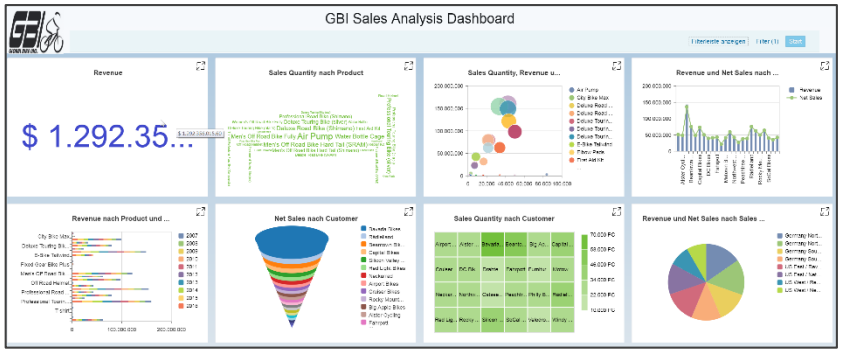


Display Properties



Reused KPI tiles





Simple dashboard using KPI Tile composite for every chart

Agenda

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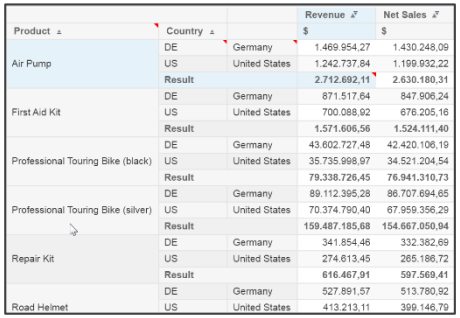
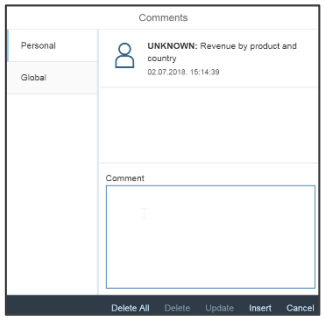
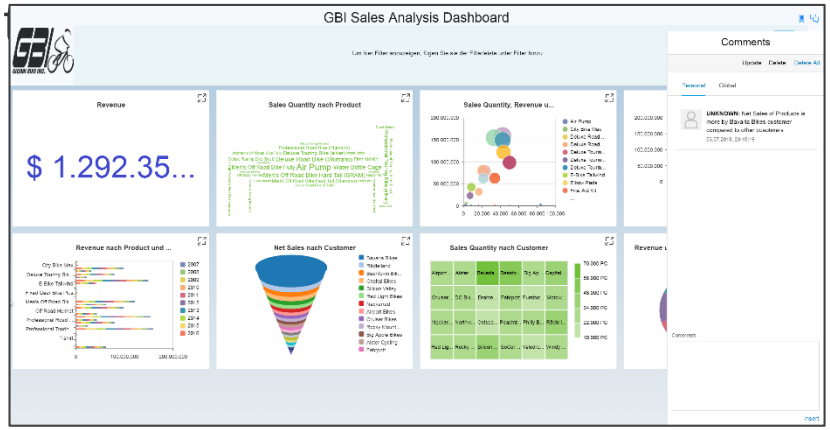
Commentaries Overview in Lumira Designer

- You can add and view comments in your Lumira document.
- Application-based commentary and data context / data cell-based commentary are both supported
- Private commentary and public commentary
- Integrated with commenting infrastructure on BI platform
- Comment as new technical component



Product	Country		Revenue $	Net Sales $
Air Pump	DE	Germany	1.469.954,27	1.430.248,09
	US	United States	1.242.737,84	1.199.932,22
	Result		2.712.692,11	2.630.180,31
First Aid Kit	DE	Germany	871.517,64	847.906,24
	US	United States	700.088,92	676.205,16
	Result		1.571.606,56	1.524.111,40
Professional Touring Bike (black)	DE	Germany	43.602.727,48	42.420.106,19
	US	United States	35.735.998,97	34.521.204,54
	Result		79.338.726,45	76.941.310,73
Professional Touring Bike (silver)	DE	Germany	89.112.395,28	86.707.694,65
	US	United States	70.374.790,40	67.959.356,29
	Result		159.487.185,68	154.667.050,94
Repair Kit	DE	Germany	341.854,46	332.382,69
	US	United States	274.613,45	265.186,72
	Result		616.467,91	597.569,41
Road Helmet	DE	Germany	527.891,57	513.780,92
	US	United States	413.213,11	399.146,79

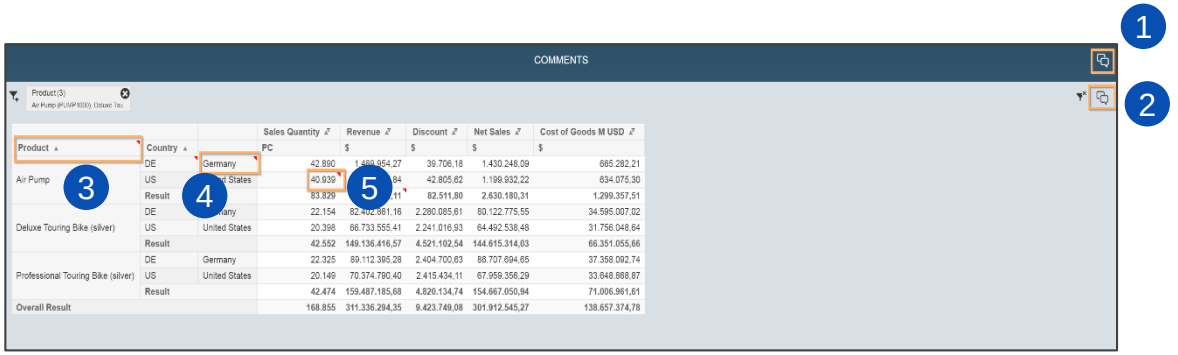




Comments types

Different Comments Types:

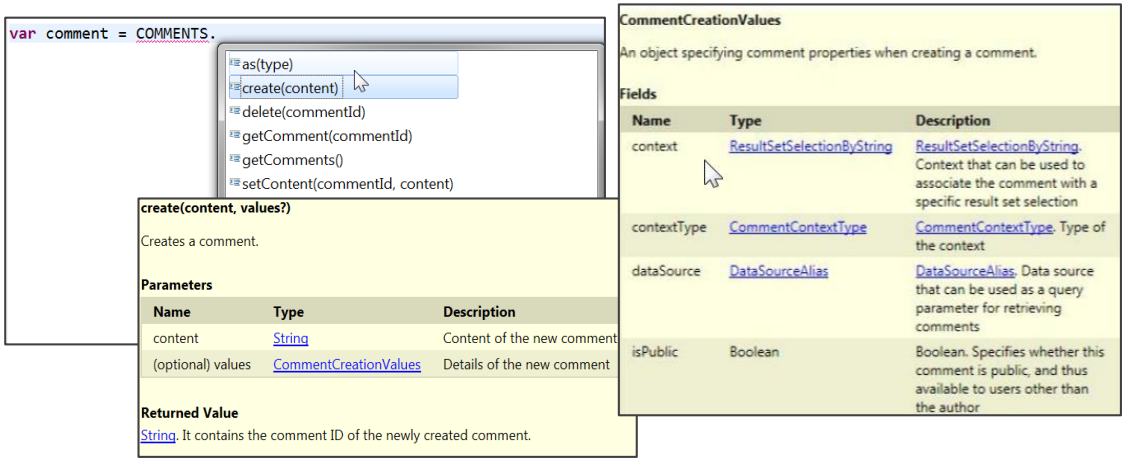
1. For the entire application
2. For the applied filters of a specific list of dimensions
3. For a dimension: create comments on a specific dimension
4. For a dimension member: create comments on a specific dimension member
5. For a cell in a query: create comments on specific data cells



Create Comments using scripting

Using API Comments.create()

- content (String)
- context: as string or from context menu selection of a crosstab
- contextType: Data, Member, Dimension, Context and None.
- dataSource
- isPublic



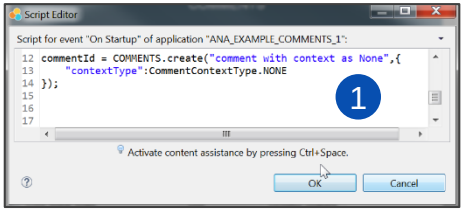

```
var commentId = COMMENTS.create("This is a comment");
```

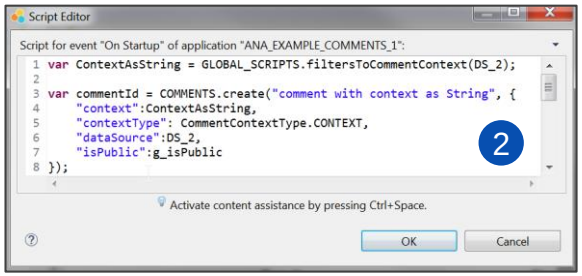
Creating a simple comment

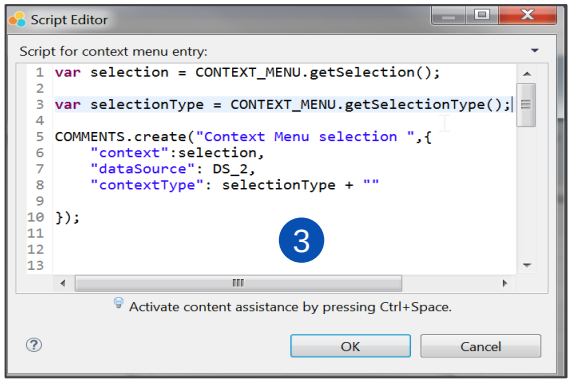
Comment context

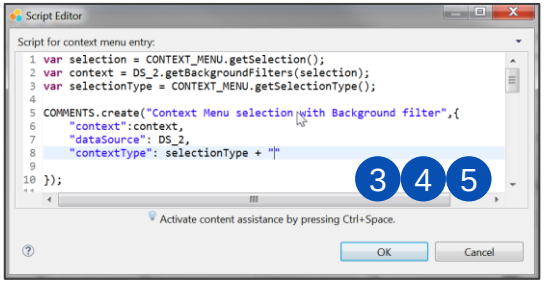
Users can create or get a context to be used in comment creation and querying in a Lumira document in following ways:

- 2 From a string or JSON object
- 3 4 5 From a crosstab with background filters
- 5 From a crosstab cell selection



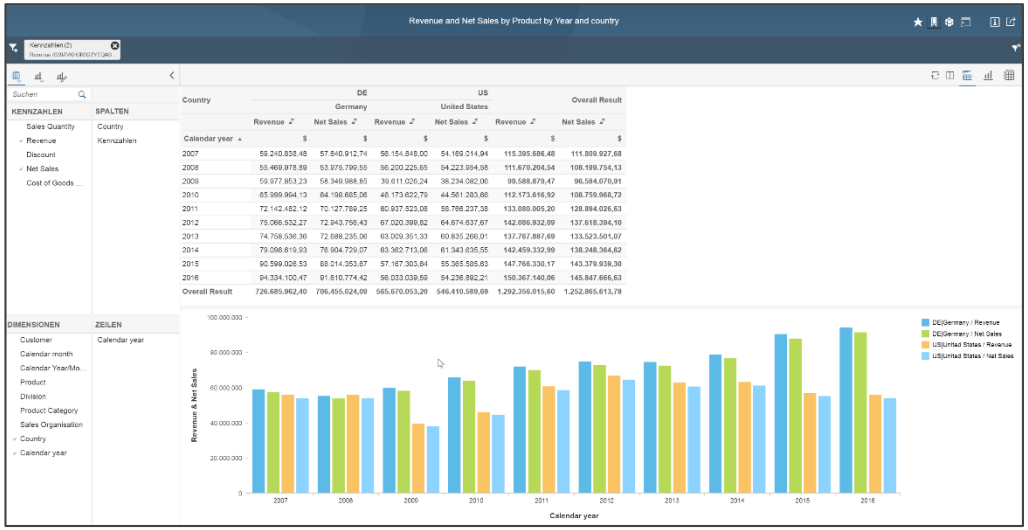






What is a Bookmark ?

- Capture and save your personalized view of your dashboard
- Bookmarks only persist the state of the application
- Share your saved view with other users
- Leverage BI platform permissions and roles to control data access



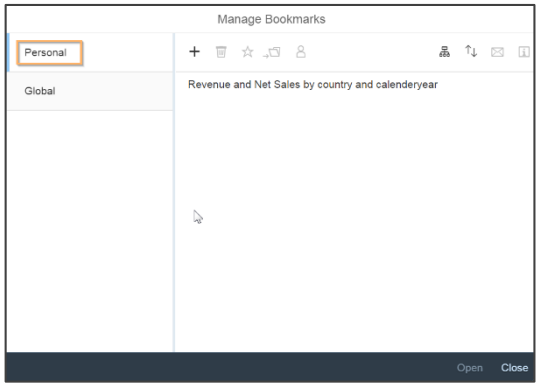
Revenue and Net Sales by Year and Country saved as a Bookmark

Bookmark Process and Categories

- Bookmark definition through technical bookmark object and scripting
- Bookmarks are saved in folders and managed in the Central Management Console

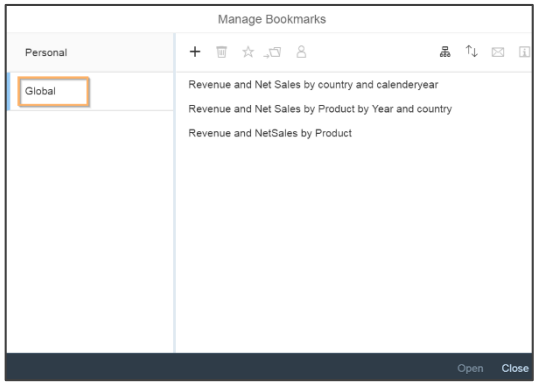
Personal Bookmark

➢ Only creator can view, edit and deleted it.



Global Bookmark

➢ All users view it. Rights to edit, move and delete are necessary



Recap and Conclusion

- Data visualization
  - Has a long history
  - Is very important to consume a lot of information in a short time
  - Needs a clear goal and representation
  - Is often too fancy and not simple enough
- Collaboration within reports
  - Reusable composites in SAP Lumira Designer allows to build consistent dashboards and make maintenance easier
  - Functionalities like commentary and bookmarks improve the work within a report/dashboard

➢ Effective reports and dashboards are not just done with composing charts and filters on one page!

What should be the focus of an analytics course?