How to build a business dashboard
Cheap, fast and in high quality

15.11.2017 | Tobias Riedner, WITTENSTEIN SE
My company and role

My role at WITTENSTEIN

- Project manager for ATHENA
- Goal:
  - providing worldwide information to the top management
  - Set up effective dashboards
- Technical complexity is very high:
  - Up to 30 source systems
  - 2 data warehouses
  - Duration: 4 years
- Budget: X.X Million EUR
Cheap

Fast

High Quality
What will happen in the next 30 minutes

Cookbook for the design of dashboards

- Recognize the common **problems** in dashboard design
- **Understand business questions** and how to **answer** them
- **Avoid clutter** and arrange data in a way that **communicates clearly**

Tobias Riedner, WITTENSTEIN SE

- Business case and assumptions [5 minutes]
- Proposal for the design process [20 minutes]
- Questions [5 minutes]
Dashboards offer an exciting new way to provide people at a glance with the critical information they must monitor to do their jobs. But the problem is time.

Yes, I want a dashboard!

Ok, Where is MY dashboard?

Forget dashboards! Give me my Excel
Assumptions

“A dashboard is a visual display of the most important information needed to achieve one or more objectives; consolidated and arranged on a single screen so the information can be monitored at a glance.”

Stephen Few

Key characteristics

- **Users**
  - Everyone with a valid business question or problem is allowed to use a dashboard
  - "Most important" for the dashboard consumer (person or persona) -> individual view on data

- **Design**
  - All the visualization objects fit on a single screen or page -> scrolling is not allowed
  - Interactivity such as filtering and drill-down can be used in a dashboard -> but not on the same page

- **Data**
  - The displayed data automatically updates without any assistance from the user.
  - The frequency of the update varies by business question and by purpose.
The design process
Proposed by SAP for business software

- Need Finding
- Conceptual Design
- Production Design

Test & Iterate
**IBCS® TOP TEN**

**International Business Communication Standards**

**MESSAGES**
- Reports and presentations have messages. Present them at the top of each slide or report page.

**TITLES**
- Titles identify pages, charts, and tables, naming at least organizational unit(s), measure(s), and time period(s).

**TIME & STRUCTURE**
- Time and structure are the most important analysis types. Arrange time series horizontally and structural comparisions vertically.

**TIME PERIODS**
- Time periods such as 'years' and 'months' should be identified by different category widths.

**46 products are in the segment of 3 mUSD**

(WITTENSTEIN | Cookbook for Dashboards | Tobias Riedner | Proprietary Information 15.11.2017)
How can we bring it together?
Business case
As external and internal business intelligence consultant

- 03/2013: Certification as IBCS
- 03/2014: Customer Project
- 05/2014: Introduction To Stephen Few
- 02/2015: Start at FLYERALARM
- 05/2016: Start at WITTENSTEIN
- 05/2017: Process Presentation
Need finding

Which information does the customer need? Who is my customer? What is the most important data?
**Stefanie Heller**

I am 24 years old and studied business economics. I work every day from 8 to 5 at WITTENSTEIN in Harthausen. I own a laptop. I am located in the financial department and analyze questions considering sales.

**Working Arrangement**

I am always in a bureau with my colleagues. I own a laptop, a big external screen as well as a docking station.

**Motivations**

Data are the key in my work life. Analyzing customers, products, suppliers. That is what I do and what I really enjoy. Revenue, order counts and costs have to be reported daily.

I love to create information out of data. I like my role as internal consultant.

**Average Day at work**

I arrive at 8 and start my pc. First, I check my emails and organize my day. Before lunch, I do the whole important things. After lunch, I plan free time to answer urgent calls or mails. When I receive some questions, I have to load the data via reports out of the different source systems. Sometimes, I ask my colleagues if they could send me an Excel-file with their data. At 12 am, I do lunch and I leave the company at 5 pm.

**Frustration**

I am frustrated because I do not access data which I need for my work. I don’t care if the problem is the access to the source system or to the Excel file of my colleague. And I hate the huge time load when I prepare the data for data analysis. Very often, Excel crashes because it cannot handle the data volume. In addition, my standard report is every month the same but I spend so much time on recreating.

I love my role as financial analyst but I am very frustrated because of the circumstances.
Stefanie Heller`s Desk
Really important information

1. Screen: resolution, size, proportion
2. Control: mouse, keyboard
3. Hardware: desktop pc or laptop?
4. Accessories: smartphone
5. Printing: DIN A 4, 3
Other`s desks
Really important information

1. Hardware: only a tablet
2. Hardware: no external screen
Build groups

Sales

Marketing

Product Development

Analysts

Production
Point of views for sales representatives
Caroline and Peter

Questions:
- What is my revenue and order income calculated at the end of the year?
- What is the expected trend/development?
- What is my trend in the last 12 months?
- What is the trend of the customer’s fiscal year?
- What is my order range?
- What is the ratio of revenue and order income?
- What is the trend of the deliver reliability?

Measures and unit:
- Order income [CUR]
- Revenue [CUR]
- Order backlog [CUR]
- Production costs [CUR]
- Contribution margin
- Delivery reliability [PERCENT], time-to-market [TIME]
- Residual [CUR]

Comparison:
- AC, PY, AC, PL
- Month, Quarter, Year on Fiscal Year

Dimensions:
- Geography (Region, Country, etc.)
- Account Manager
- Subsidiary company, trader, end customer (Customer)
- Products
- Suppliers
- Customer groups, structures, branches

Focused Process:
- Sales
We understand our customers

What we did?
- Who is your user and the environment?
- Can we find groups with same characteristics?
- What is their need for answers?

What we do next?
- How does the user want to answer the questions?
- What is our product?
- How do we visual the data?
Page design

Avoid clutter and arrange data in a way that communicates clearly
Storyboard describes the usage of the dashboard

1. Arriving at the desk

2. View the data on the screen

3. Make some calls
We design the dashboard with wireframes

### Express, Unify, Simplify

#### Measure

<table>
<thead>
<tr>
<th>Measure</th>
<th>2013</th>
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<td>9.289</td>
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#### Product A, B, C

<table>
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<tr>
<th>Product</th>
<th>2013</th>
<th>2014</th>
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<tr>
<td>Europe</td>
<td>10.189</td>
<td>9.289</td>
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</tr>
</tbody>
</table>

#### PY, AC, PL

<table>
<thead>
<tr>
<th>Region</th>
<th>PY</th>
<th>AC</th>
<th>PL</th>
<th>AC-PY</th>
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<td>10.189</td>
<td>9.289</td>
<td>12.289</td>
<td>-900</td>
</tr>
</tbody>
</table>

### Data Source: SAP BW - Query Sales

Dashboard Creator: Riedner, Tobias (Tel: 18485)    User: Riedner, Tobias     Data Refresh: 07. Juni 2016   09:32 CET
Point of views for sales representatives

Caroline and Peter

Questions:
- What is my revenue and order income calculated at the end of the year?
- What is the expected trend/development?
- What is my trend in the last 12 months?
- What is the trend of the customer’s fiscal year?
- What is my order range?
- What is the ratio of revenue and order income?
- What is the trend of the deliver reliability?

2 measures, comparison in scenario -> Table

Trend for 2 measures -> chart (line, bars)

Trend -> chart (line, bars)

Filter on the data -> no impact on visualization

Order range -> order / daily output = 25 days -> tile

Ratio “Book to Billing” -> Revenue / Order Income = 1:2 -> tile

Time series

Data points
Columns
Patterns
Lines and areas
Structure

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<th>Data points</th>
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<th>Structure</th>
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15.11.2017
WITTENSTEIN | Cookbook for Dashboards | Tobias Riedner | Proprietary Information
WITTENSTEIN SE | BU XXX | Dashboard Sales BU XXX

Revenue, Order Income in kEUR, Order range in d, Book To Bill, Deliver Reliability in %
Fiscal Year 2016/17, AC, PY, FC, PL

Navigation: Home > Profit Center

<table>
<thead>
<tr>
<th>Revenue</th>
<th>FC-PL</th>
<th>Order income</th>
<th>FC-PL</th>
<th>Order range</th>
<th>Book To Bill</th>
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<td>+8.8%</td>
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</table>

Revenue 143
Order income 140
Delivery Reliability 98
### Top 5 by Revenue in mEUR

#### Fiscal Year 2015/16

<table>
<thead>
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<th>Rank</th>
<th>Customer Type</th>
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<th>ΔPY</th>
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<tbody>
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<td>5</td>
<td>WS BVBA</td>
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### Top Products

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<tr>
<td>5</td>
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### Top Suppliers

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<th>ΔPY%</th>
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<tbody>
<tr>
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Our solution for smartphone