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Visual Information Design

Choosing the right type of chart based on the report's key message

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In our "Visual Information Design – How to Create Meaningful Reports" series, which started in January 2017, in this edition, the last one for now, will focus on the key message of a report and choosing the appropriate type of chart. Here we will answer the following questions:

- What approach should you take when producing a report?
- What type of chart is right for my report?
- Is it possible to reinforce the message with a graphic representation that has already been selected?

1. What is the report's key message?

Well known people are focussing on the subject of Visual Information Design.

In the field of Visual Information Design in German speaking countries, you often come across the name Dr. Rolf Hichert. But there are others, such as Stephen Few or Edward Tufte, who have focused on Information Design.
In the current white paper we will touch on their considerations on one hand. On the other hand – and this is our primary objective – we will share our conclusions with you.

A report's message is the focus of all the following considerations.

To create meaningful reports, the first question must be: What is the key message of the report you are producing? The recipient should be able to make decisions based on facts from the report created.
It is important here that the recipient's needs are always in focus. This advice on creating a meaningful report is labelled as "Say" by Hichert or "Ask why" by Few. The message of a report is the basis for all the following considerations when creating it.

These considerations are for example:

- Who is the recipient and what recommended actions are conveyed by the sender?
- What type of chart is the most suitable to specify the message more precisely?
- How should you structure the chart?
- Is there a need for additional text to explain it?

2. What type of chart should be used?

After the key message and the desired recommendations for action have been developed by the sender, the next step is to clarify how this information is to be provided to the recipient.

In general, some key ideas on the types of chart can be observed in advance. Every type of chart is suitable for responding to various contexts differently. Some types of chart are suitable for a ranking or correlation, some are not. And so every type of chart has its pros and cons and choosing the right type of chart is therefore the main task in information representation. Both Dr Hichert's HI-SUCCESS rules and Stephen Few's "Graph Selection Matrix" can be used for this. We recommend that you have a look at the Graph Selection Matrix, because this is presented very clearly and it is easy to understand.

Let's consider another example of information representation taking both the previous points into consideration: What is the report's message or content and what type of representation should you choose?

In our example we want to show a plan vs actual variance. Even in the first consideration, the question arises: Are the exact numbers important or is this representing a progression?

In this example we decide against a table and the exact data, cells and a traffic-light representation or something similar (see whitepaper no. 2). Instead we choose a graphic representation. The report should represent the progression of the plan vs actual variance for the chosen indicator.

According to the Graph Selection Matrix, a curve or line graph is suitable for this representation. This could result in the following graph.

Selecting the right type of chart is real skill of Visual Information Design.

A line graph is suitable for representing the progression of numbers.
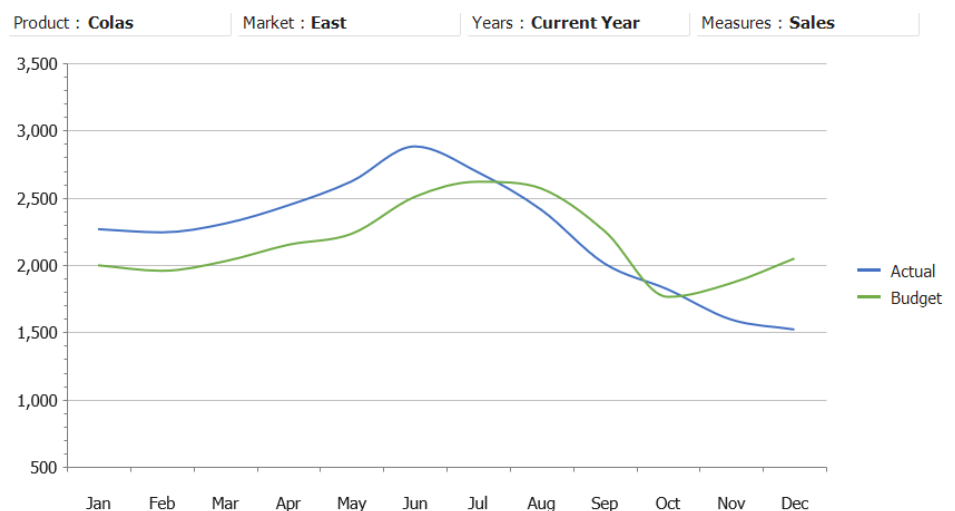

Fig. 1: Line graph for the monthly progression of the plan vs actual variance for a kpi without a title or recommended action.

Let's check this representation and the report's message again. We see the progression of the plan vs actual variance on a monthly basis. The key message is aimed at the variance. As demonstrated in whitepaper number 3, the eye is

automatically drawn to the crossing points. In this case the actual values are smaller than the plan values. For a short time (in October) the trend is reversed, but it can be generally observed that sales do not meet expectations from July onwards.

In the next step you could consider whether the expectation was not met entirely, or whether there were months when the variance was rather small. This representation does not help us beyond this, because it is difficult to identify the percentage or absolute change.

With this insight, we come back to the starting point – the report's message. If the variance is the report's message, the question arises: Would a different type of representation make more sense?

As an example we are now displaying a percentage-based variance of the data. In addition, we decide to show the actual and plan data as bars and the variance as a line.
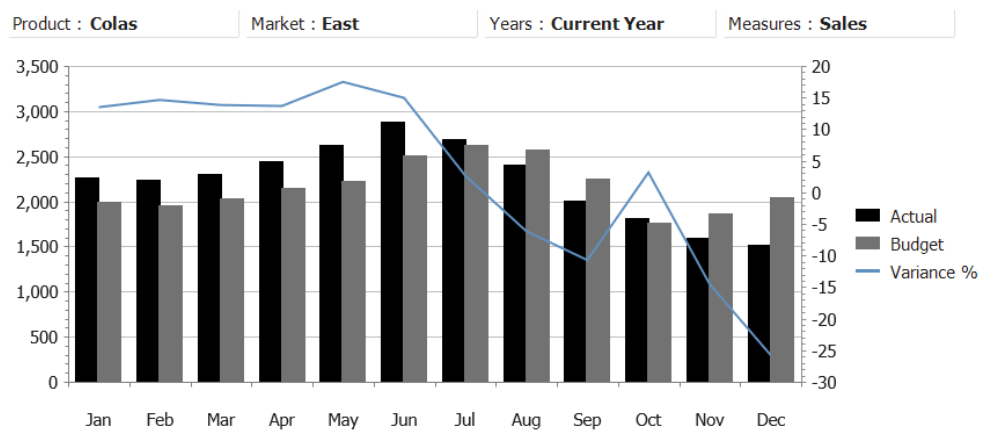

Fig. 2: Bar chart with a secondary axis for the monthly development of the plan vs actual variance for a kpi without a title or recommended action.

As can be seen in figure 2, this gives our report a bit more context. Along with the absolute figures the variance is now represented in percent. This is shown with a separate axis (different scale). Why is it useful to have an additional scale? A graph with only one scale would ensure that the variance in percentage is barely perceptible, because the values in relation to other kpi (sales) is much too small.

Would it be possible to represent the plan and actual data and the variance as lines? We think a representation with three lines would not be a good idea for two reasons. Firstly, there are too many crossing points and secondly it is harder to read the representation.

We would like to show the effect (without colour representation of the plan and actual data) in the next figure.

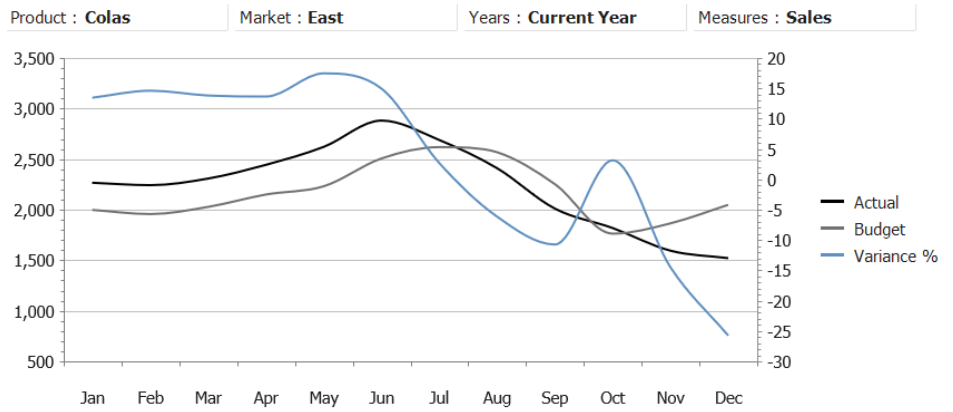| Product : **Colas** | Market : **East** | Years : **Current Year** | Measures : **Sales** |

Fig. 3: Line graph with a secondary axis for the monthly development of the plan/actual data without the title or recommended action.

As was described, we want to distance ourselves from figure 3 and to consider another point in connection to the report's message and figure 2.

When using two scales as shown in figure 2 there is the problem that the value on the second scale is difficult to understand. We estimate the representation is troublesome because the line crosses the bars quite often. However, a representation like in figure 2 can be improved with formatting tweaks (putting the bars more in the background and the line in the foreground. But we still recommend avoiding using two different scales where possible.

In order to bring the key message of the variance to the foreground there is another possibility, however. This is depicted in figure 4.
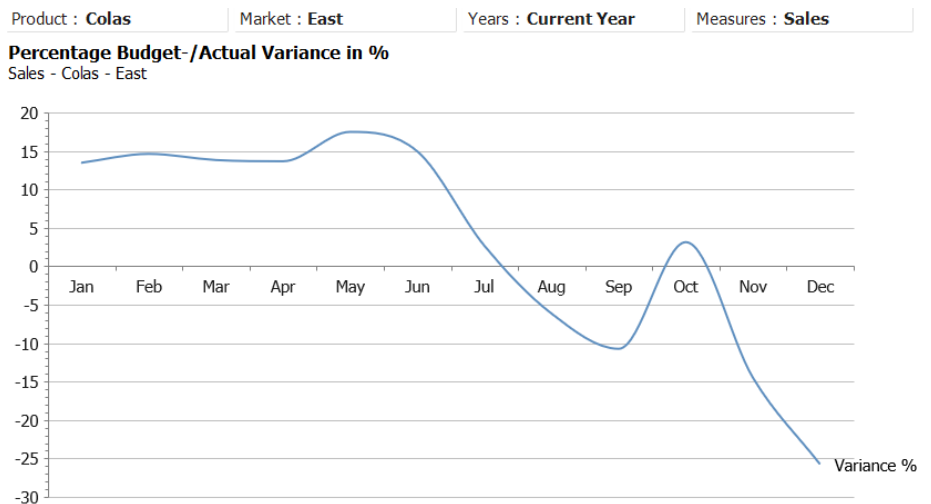
| Product : **Colas** | Market : **East** | Years : **Current Year** | Measures : **Sales** |

Percentage Budget-/Actual Variance in %
Sales - Colas - East

Fig. 4: Line graph of the monthly progression of the plan vs actual variance

In this graph you can only see the percentage variance. The variance in September is about 10 percent, the negative variance in December is over 25 percent. In comparison to all other months, the variance in December is twice as great as in the other months (September approx. 10 percent, November approx. 15 percent). This large variance is not visible in the previous example graphs.

When the report's message is purely about the variance, then figure 4 is a sensible option, to put this consciously in the focus.

Summary

The most important thing for every report is the key message. The message affects the contents. It also affects the type of visualisation. Have a look at the recommendations in the Chart Selection Matrix and use it to guide you. Consider if another method of representation, such as in the examples, makes sense in order to make the message clearer.

To make it more readable, use a title and format the axes accordingly.

You can find more helpful tips for representing information more effectively in our Visual Information Design series.

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