

BI solutions with Visio

Graphical visualizations with Visio, SharePoint and Visio Services

More or less every user of Microsoft office in an organization knows Visio or gets to know it sooner or later. Almost always the term “drawing tool” comes up. So the user starts and “draws” with Visio the network diagrams, org charts etc...

But you couldn't be more unfair to Visio than to use the term “drawing tool” – because if there is something Visio clearly is not, then it is **not** “a drawing tool”. In fact every simple drawing program and tool is with respect to drawing more powerful than Visio.

No, what you create with Visio in fact is not a drawing at all, because a drawing is meant to depict some object from reality as precisely as possible (or the tool allows). However if you look at what you create in/with Visio you very soon discover that Visio has almost nothing to do with reality, the output is not reality-like.

However in every organization there are graphical needs where not the visual representation is the key point (although important but in a different way) but the data and the relations of the data. The difference to a drawing is also, that these visualizations are highly standardized and you “see” in the first second what the general purpose of this visualization is. If you hear the term “org chart” nobody needs to think about what that is - it is clear by standardization. The reason is that everybody builds org charts the same way (rectangles, hierarchical structure) – nobody really changes the visual basics completely.

These visualizations (also network visualizations or flowcharts are part of these) are generally known as diagrams – where certain aspects or data relations are important – but not the precision of the “drawing” – that is whether the box is 2 mm more in width or less is not the crucial matter. However the relation of the objects or their metadata – that **is** vital – and that is what makes the difference between a diagram and a drawing. So Visio lacks many things a drawing tool would have simply because it is a – or better **the** – diagramming tool.

If you think of BI- (Business Intelligence) scenarios, which is a visualization that shows you in a few seconds the facts needed for a business critical decision, using Visio is a logical consequence.

Since most diagram types are very standardized, the purpose of a diagram is to emphasize some data or data relations the main task is not “complex” visualizations. So Visio is the most simple but not least powerful BI tool from Microsoft – but it is in fact a general purpose diagramming tool – which “happens” to also be able to be used for BI purposes.

Diagrams: the power of Visio

Business diagrams are visualizations where a certain scenario, its data and data relations need to be visualized. To be able to complete the task with Visio, one component is missing: the data. Visio diagrams differ from drawings by the fact that in drawings you also have to “draw” the data into the drawing whereas in a diagram the data can be embedded in the components to be usable but not necessarily visible all the time – just only when it is really necessary.

The components by which diagrams are created are called shapes (you can also say that whatever you put on a Visio page is called shape – no matter how it looks like). These shapes also have the capability to store an almost limitless amount of data, Visio diagrams are always data-driven too. Another way to put it would be that the shape is “just” a graphical container for data or metadata. In a network diagram for example the data package consists of the inventory number, the IP address, the memory, the drive capacity etc. This data structure of course differs depending on the diagram type and usage type of the diagram – so Visio makes it also easy to adapt and modify this structure to your needs.

Data-driven diagrams: the basics of BI

The data and its structure is determined by the diagram type. However the job is not easy to do if creating and especially maintaining the diagram consumes a lot of time – the diagram creation is not the main purpose of your job. The diagrams should support your daily tasks and work.

Updating and maintaining the data is the most error-prone task. To avoid these problems Visio (since 2007) offers a data connectivity function. This component of Visio is capable of connecting a Visio diagram to nearly every structured data source and transfer the data into the shapes. The component however is only capable of reading the data and storing it into the shapes – there is no danger that Visio might accidentally modify or corrupt the data.

Out of the box, Visio supports the following data sources:

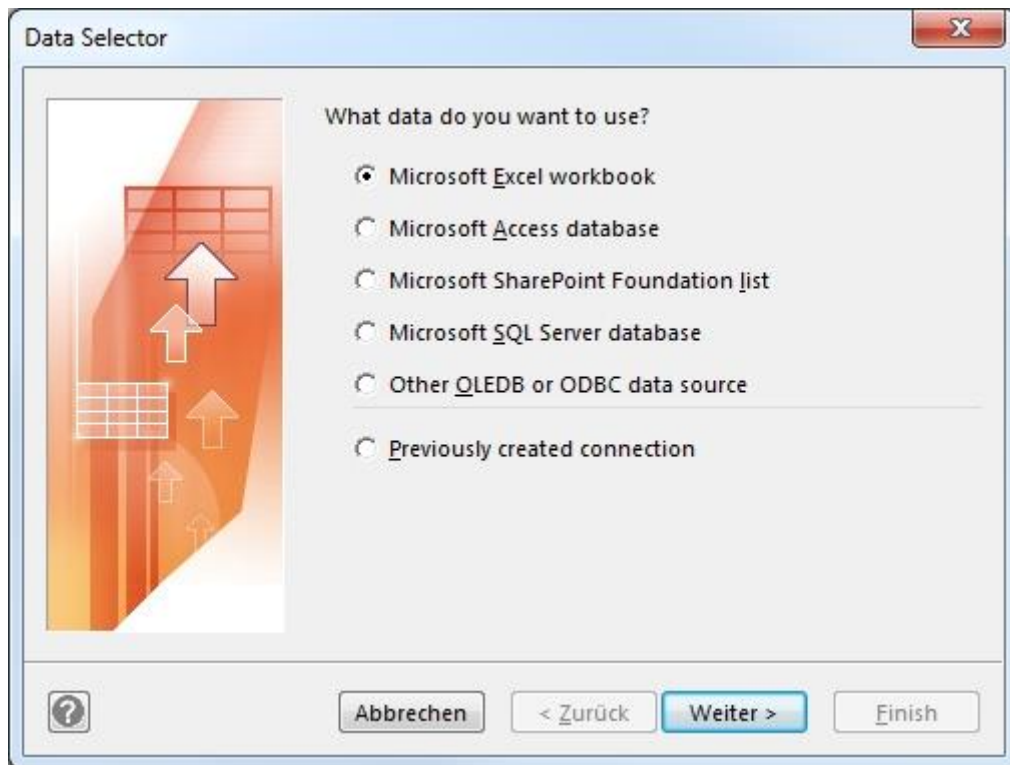


Figure 1: Data sources

As you see, almost everything that can be called a structured data source is available to you in the dialog. Anything that is not listed can be attached through OLE DB or ODBC – which literally is „the rest of the data world“.

So when a shape is connected to a data row (through drag and drop), the first big step is done: the diagram is created and the data is transferred to the container component – the shape.

However for real BI purposes this is not enough yet – often we do not need the „raw data“ but some interpretations to see groupings or peaks with just one look. Only this allows to take immediate steps if necessary.

Data visualization and interpretation: the DataGraphics

The Visio 2007 Professional edition (and newer of course, but always the Professional edition) Visio adds DataGraphics. DataGraphics are visualization and interpretation rules that can be applied to any shape(s) and that are defined once globally in the file.

Every DataGraphic needs two things: the data field (ShapeData) and the interpretation type. The following interpretation types are available:

- Text: the data is not interpreted but just shown as text, a value or label
- Data Bar: if the value is a number the data bar (e.g. Thermometer) can show the value on scale between a minimum and a maximum
- Icon Set: each value or range of values gets a specific icon
- Color by Value: for a certain value a fill color is applied to the shape

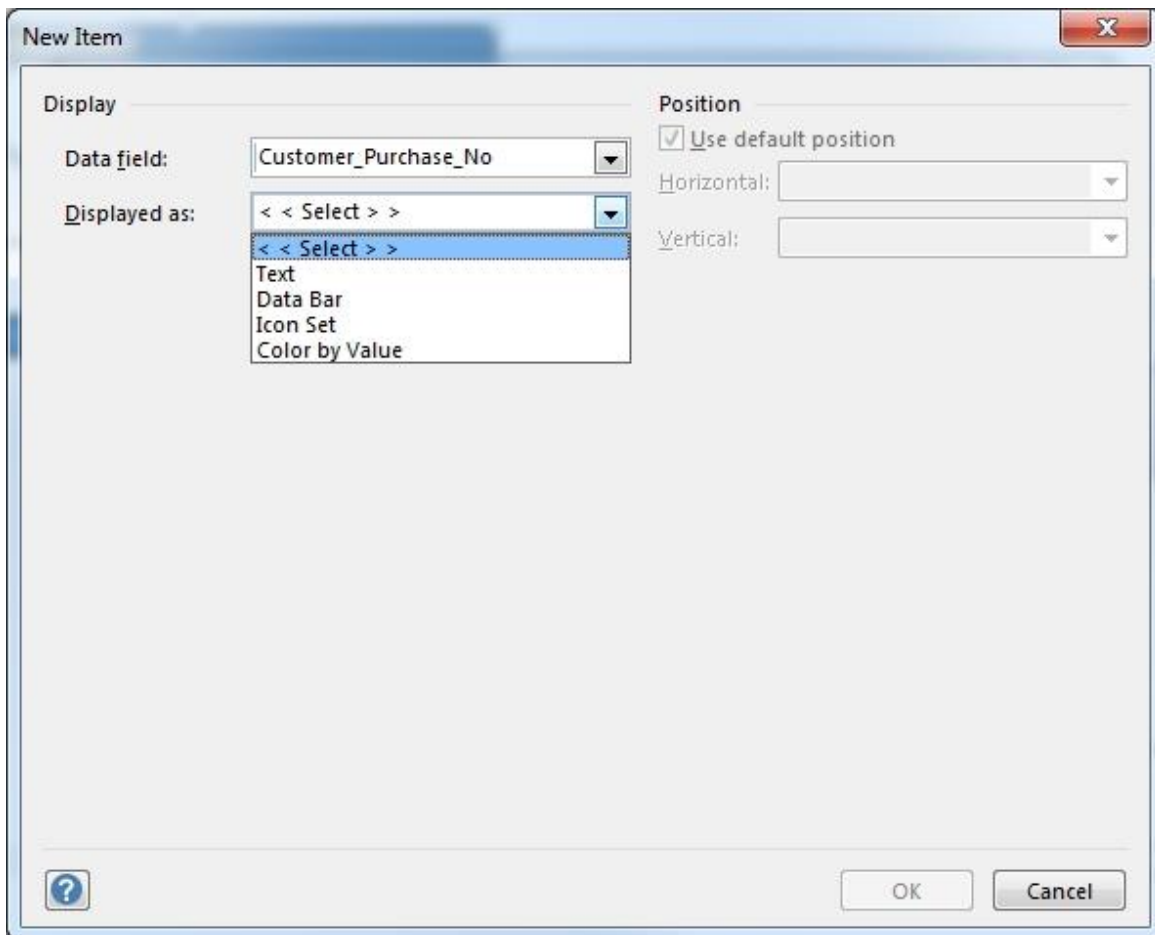


Figure 2: The four categories of DataGraphics in Visio

If you apply a DataGraphic to a shape – whereas a shape can have many shape data entries and also many DataGraphics – it is displayed around the shape (see “Position” in figure 2) or it changes the color of the whole shape accordingly.

From the diagram to the BI basics

The diagram that was created, bound to data and interpreted/extended with DataGraphics is already the foundation of the BI since it visualizes and emphasizes the critical values (e.g. peaks) as an icon or allows the discovery of trends by groupings of icons.

„A picture is worth a thousand words“ is the marketing phrase of Visio on the one hand and on the other hand also the easiest description of what BI is all about.

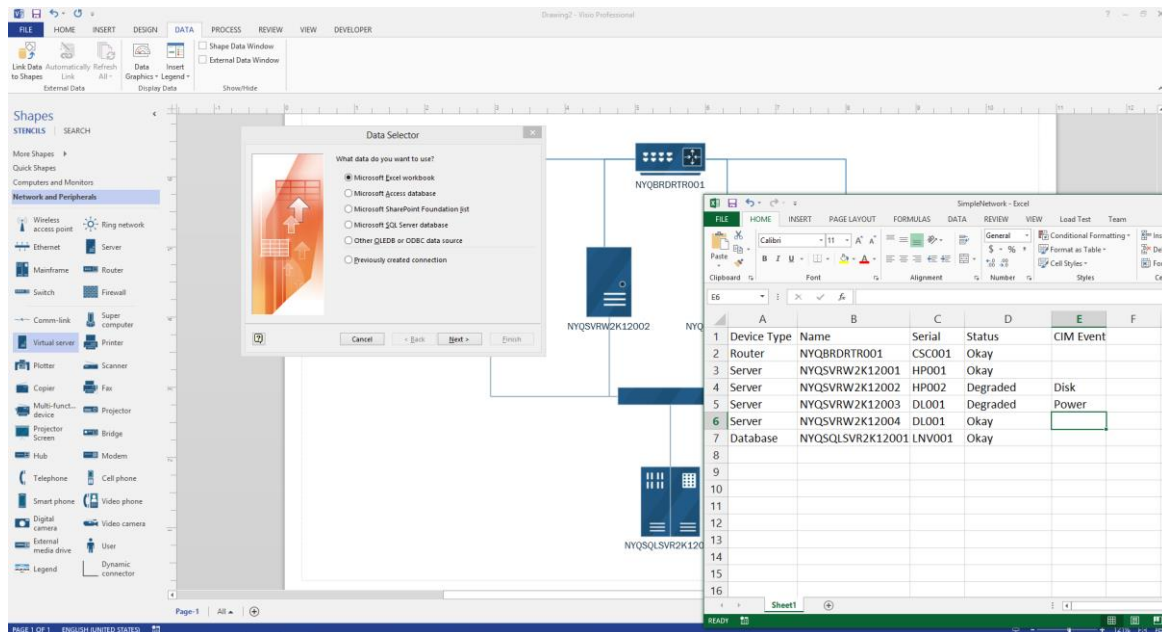


Figure 3: From the diagram to the decision base - publishing in Visio Services

So now you have a data-bound and data-driven diagram and want to make it available to a larger amount of users as a work and decision making basis. The easiest option would be to send it to all of the users. However quite often this is not practicable for several reasons:

- The user(s) might not have access to the data source
- You don't want to share the file itself to avoid manipulations
- The user(s) might not have Visio installed

Exporting the file to HTML etc. is also not an option since that creates a static view of the file and only shows one current moment of the state of the file.

With SharePoint Microsoft delivers (since 2010 Enterprise Edition) a component that solves those issues: Visio Services

Visio Services is part of SharePoint Enterprise and allows the publication of Visio files into SharePoint. The file is simply saved in a document library – that's all. To view the file a

“normal” user just needs a browser – on the SharePoint side a Web part, the Visio Web Access Web part is doing the work once it is set to a specific file. The user can view the file, it is updated from the data source but the user cannot change the file itself.

The big difference to a viewer is, that Visio Services knows how to access the data source and update the diagram data (and DataGraphics) – on the fly. The diagrams in the SharePoint portal are always up to date.

Such diagrams and visualizations can be created without even one single line of code – an advantage which is very important in times where requirements change almost on a daily basis and long coding is not feasible. The user creating the files and web UIs doesn’t need to be a programmer – it’s just a normal end-user like the consumer – the “creator” just needs to know how to use Visio.

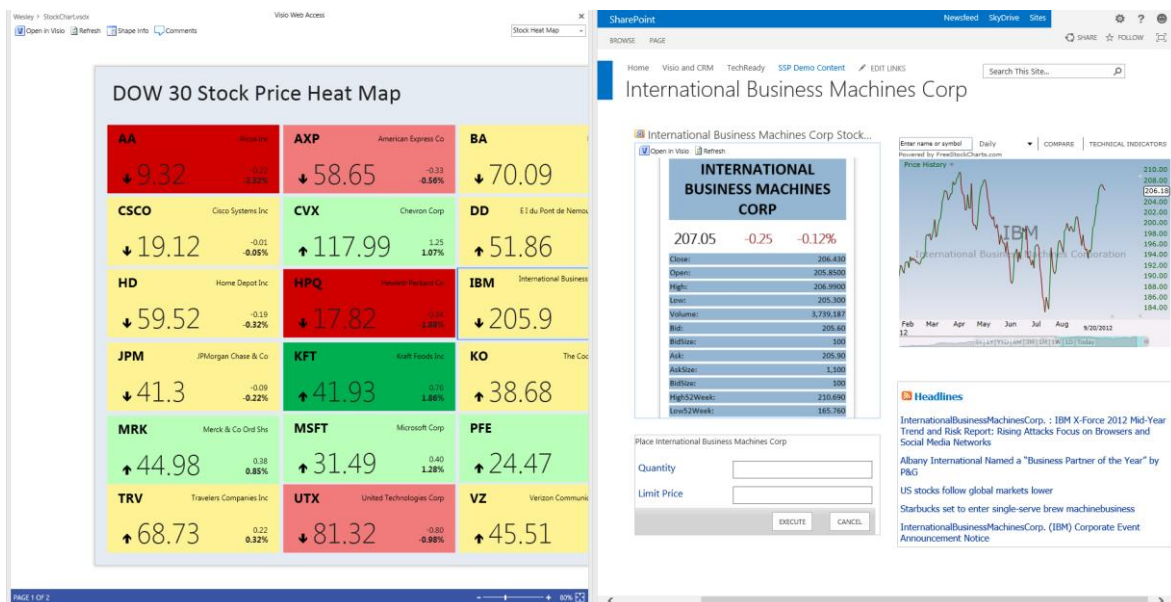


Figure 5: Sample visualization in the Visio Web Access Web part

About the author

Senaj Lelic is working in the IT business since 1991, also studying economy at the university of Munich (special studies: strategic management and software based Business Process management). Starting with BORLAND, he went on to work with the Visio Corporation in 1996. Therefrom he was working on different visualization solutions for different customers. In 2000 when Visio was acquired by Microsoft his focus shifted to contain Microsoft.NET as a programming platform and also since 2003 the technology SharePoint extending also to supporting technologies such as SQL Server and the System Center products. Since 2007 the Unified Communications Technologies and especially their programming integration into custom solutions is one of his additional interests. One long-term activity is also the creation and planning/architecture of BPM solutions and technologies - always using Visio as the graphical engine, but extending the scenario with SQL Server and also SharePoint to create powerful but easy to use BPM solutions.

