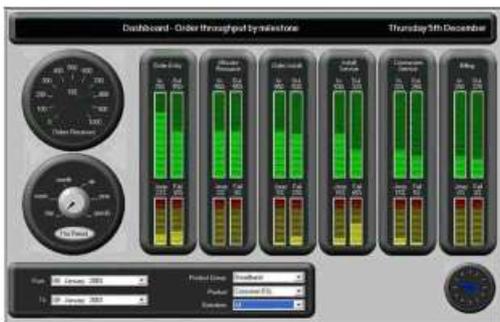


About to embark on a dashboard implementation?



Effective dashboards enable users to visually display relevant and current tasks and projects, account performance, management costs and any other critical information that effects or is needed to achieve business objectives.

Any organisation considering implementing a corporate dashboard solution will undoubtedly have a core set of strategic actions, usually 4-6. These actions must be measurable, otherwise there is no way of knowing whether the strategy is successful. Leading practice would suggest that only the measures that support these actions should be contained on the front sheet of the dashboard – anything else is detail. The idea is to create a simple overview, with as few numbers as possible, and using indicators to highlight variances and sparklines to show recent trends.



It sounds simple, but there are many examples of dashboards that have failed to deliver. Often this is because there is a tendency for designers to forget that the purpose of the tool is to support those business objectives and concentrate instead on creating something which sacrifices the importance of the underlying data in favour of creating something which whilst pleasing on the eye, actually adds little in value to the organisation. Here we provide guidance on how to avoid the common pitfalls and deliver a tool which really adds value to your organisation.

Dashboard Definition

Dashboards mean different things to different organisations, but it useful to at least attempt to define what a dashboard is. According to leading BI practitioner Stephen Few,

Dashboards consolidate onto a single screen the sometimes disparate information that someone needs to monitor to do a job. This single-screen display need not be comprehensive in and of itself, but it must provide the overview that is needed to know when action is required, and ideally should provide an easy gateway to any additional information that is needed to determine the precise action that is appropriate. Dashboards tend to be highly visual (that is, graphical) in the way they present information, not because it is cute or entertaining, but because when presented properly, pictures of data can be scanned and understood much faster than the same data presented as text.



The 10-Point Approach

Dashboard design over the last 10-15 years has tended to focus on defining a series of metrics and then placing a variety of charts, gauges and tables on a single page. The problem with this approach is that it can lead to a jumbled appearance and confusing messages. Over the same period, internet websites have evolved greatly – from simply displaying the right information on the page to today's websites which cater for user needs in the most user friendly way and with the sleekest design. Its time dashboard design caught up. Here we will share our ten point approach to help you design user friendly dashboards that really add value to your organisation.

1. Who is your audience?

Understanding the audience is critical. There are many examples of organisations that have implemented a dashboard solution only to see it fail because it didn't capture the specific needs of the consumers. Most dashboards have multiple audiences – this can help get everyone on the same page, but it can be difficult to serve a diverse audience well. Before beginning to think about what metrics to include and how the dashboard is designed, there are several basic questions which must be asked:-

- Who are the consumers?
- What decisions do they make?
- What questions do they need answering?
- How will they view the outputs?
- How much time do they have available to use the dashboard?
- How advanced are their IT skills?
- Do they enjoy drilling down into the detail?
- Do they have a common understanding of the organisations metrics?

The dashboard must be structured in a way that makes it easy to make high priority decisions, be designed for the device on which the information will be consumed, contain a level of detail that does not breach analytical capability limits, and contain familiar, simple language.

2. What are their requirements?

Once you understand the audience, decide the format which will meet their needs. Good dashboards focus on the most important information and communicate it clearly and concisely. The delivery channel, level of interactivity, timeliness of data, and analytical options will vary from organisation, but can be determined by asking:-

- Does it contain summary information about the entire organisation or is it focused on specific functions, processes or products?
- Does it provide a strategic long term view or a tactical short term view?
- Is it looking at historical trends, providing a snapshot view, using real time data or predicting future performance?
- Is it a one-size-fits-all approach or should views be customisable to meet individual needs?
- Does it only contain the most important high level numbers or should consumers be able to drill down to more detail?
- Does it tell the consumer exactly what the data means and what action to take or is the user able to make their own interpretation?

Too often requirements gathering sessions only ask "what do you want to know?" but they need to go further. Asking "what would you do with this information if you had it?" helps keep focus on important and actionable information, rather than nice-to-have information. Obviously it's not always possible to ignore requests for nice-to-have information, so consider the use of an appendix report (different tabs for example) which includes it but keeps the focus on the critical information on the front page. Similarly a dashboard is not a generic analysis tool for slicing and dicing information to explore new questions every time it's used.

Defining metrics that align behaviours, drive strategy and track success can be a tricky task. The following questions will help:-

- If the metric goes up or down, is it clear what the source of the problem is and what actions are necessary to address it?
- Is there a common understanding of what the metric means across the organisation?
- Is the calculation of the metric easy to understand?
- Can the accurate trusted data required to calculate the metric be easily accessed?

3. How do the requirements add value to the organisation?

Once you've determined what your audience needs, you need to assess what value the dashboard will add to the organisation. The purpose of the dashboard is to provide information that will drive productive action. If it doesn't do that, it doesn't add any value. This requires positive responses to most, if not all, of the following questions:-

- Does it help management define what is important for the organisation?
- Does it help employees understand what is important for the organisation?
- Does it communicate the progress and success of what is important for the organisation?
- Does it highlight exceptions and provide alerts when problems occur?
- Does it enable specific actions to be taken in a timely manner?

Always refer back to the corporate strategic actions when prioritising which requirements will create the most value added for the organisation. It's highly likely that a considerable amount of time went into creating the corporate strategy, from defining the handful of actions themselves to getting the wording of them right, and the dashboard should act as the mechanism for tracking its success. If a metric is not a means of measuring the success of the corporate strategy, there is an argument for keeping it off the front page and placing it within secondary tabs of the overall dashboard solution. Your Chief Executive is unlikely to thank you for designing something that looks great and/or contains lots of information if it doesn't tell him whether the direction he is trying to take the organisation in is bringing success.

4. Selecting the most appropriate tool

Dashboards mean different things to different organisations. A PDF attachment in an e-mail can work as a dashboard for some, yet we've probably all been in estate agents with huge wall mounted TVs showing real time viewings and sales statistics by agent, postcode and branch. There are many specialist dashboard software packages available these days – choosing the right one often depends on how the data is accessed and the device it is to be consumed on. Even if the solution is largely determined by corporate IT strategies based on relationships with specific software vendors, it is likely that those vendors will have a suite of products from which you will need to select the most appropriate. Choosing the right tool depends on responses to the following questions around data and accessibility:-

- Does the dashboard need to be connected to data contained in a system such as a data warehouse?
- How often is the data updated? Does it need to be real time, near real time (for example overnight refresh in a data warehouse), or is monthly/weekly enough?
- Does the data need to be accessed by a mobile device, such as a Smartphone or tablet, or will it largely be consumed on a desktop?

5. Designing the dashboard

You've understood who the dashboard will serve, what they need from it, and prioritised the requirements in terms of their value adding characteristics. You've hopefully chosen the right product to meet all those needs, so you're ready to start development, right? No! It's often at this stage where designers start to get carried away with designing something that looks pretty but which fails to meet the needs above which have undoubtedly taken such time and effort to gather. You now need to start considering how the dashboard will actually be designed. This will require mocking-up the design in detail, and gaining approval of that design from the audience. It's a lot

easier to change mock-ups if they don't meet requirements, rather than have to spend time unpicking a solution that has already been developed. Over the next few sections we'll breakdown the considerations into a series of design principles.

6. Layout

The traditional approach to dashboard design has 4, 6 or 9 charts of equal size placed in a grid. The problem with this approach is that it does not tell the consumer how the charts relate to each other and which information is most important.

Research shows that people tend to start at the top and in the left when reading a webpage. The centre also receives a lot of attention, but the bottom or right might not be noticed at all. Web designers use grids to ensure that key lines in their design align. This doesn't mean that the most important item cannot span two columns and be bigger than less important items, but sticking broadly within the lines of the grid helps the consumer remain at ease. The use of space is equally important – if there isn't enough space for the eye to rest all objects merge into one and it becomes difficult to see what is most important. To avoid these issues:-

- Make sure that items that relate to each other are positioned close together and that the items showing the most important information are larger and therefore more prominent.
- Consider placing the items in a particular order as it will help the consumer with where to start and where to go next
- A dashboard is more easily digested if it is broken down into bite sized chunks that address specific issues
- Information should be only revealed as and when the consumer expresses interest in it, so start with high level information about a metric before providing further context and detail
- Not all consumers will be heavy users so keep the user interface simple and attractive
- Consumers should be able to understand the source of problems quickly and determine a course of action, so consider including guidance about what a change in metric means

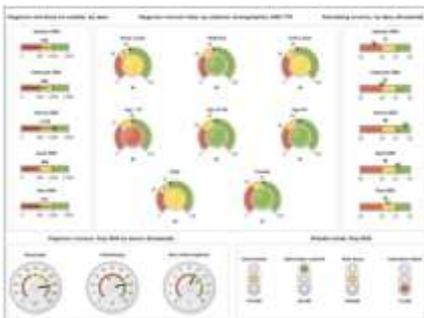
7. Colours and fonts

It is difficult to build dashboards due to the amount of information to be conveyed. It's therefore important to make sure the consumer isn't overwhelmed or distracted, so how the page is organised, and what colours and fonts are used becomes very important.

Choosing a colour scheme can be tricky, though often colours are determined by the organisation's branding. One approach would be to design using only grey and then add colour to convey the most important information. Bright colours will attract attention and can be used to increase importance, whilst using similar colour hues can be used to connect related items.

It's a similar issue with fonts. It goes without saying that fonts should be clean, look good and communicate effectively. Text can be emphasised in a number of ways by adding italics, bold, colour or a combination of those.

8. Chart types

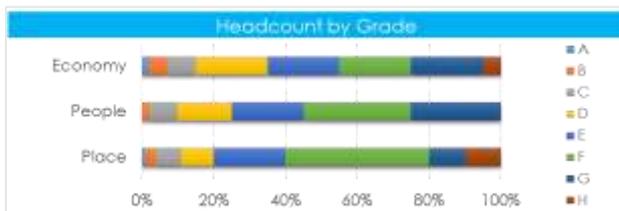


Some of the most effective dashboards are fairly utilitarian in their design. It is highly likely that the least effective dashboards will contain a range of colourful gauges, speedometers and pie charts. Whilst these type of objects can look impressive, it is difficult to put the information in any kind of context since they only show a snapshot view and no trend. Without seeing the trend, it is impossible to understand whether there is a problem that needs to be addressed or whether the data displayed is an anomaly. Often the humble bar or line chart (or a combination) is

the best way to display the data.

Dashboards need to be able to tell a story with data, and to do so requires charts and tables that are easy for the user to read and understand. Unfortunately there is no magic bullet that tells us what type of chart to use for different data types, although the data itself can give some pointers. Data can be either categorical or quantitative. Using an organisation's employees as an example, categorical data would include gender, ethnicity, HR grade and age range. Quantitative data would include headcount, number of starters or leavers and staff turnover. The different data types can be broken down further. Categorical data can be nominal, where ordering of values has no meaning (e.g. ethnicity), ordinal, where there is a certain order (e.g. HR grade) or a time series. Quantitative data can be either additive or non-additive, depending on whether it makes sense to add values or not.

In the examples below, the chart on the left shows a snapshot of headcount by grade, where it makes sense to add the grades together to show a breakdown of total headcount by grade as a percentage, and where there is a certain order (from Grade A to H). The chart on the right shows headcount development as a trend over time, which must be ordered, but where adding Actual to



Budget and Forecast would make no sense.

Make the best use of visual aids and functionality to draw attention to the most important things.

Measure	Month vs Bud	YTD vs Bud	YE Fcast vs Bud	6 Month Trend
Factored Pipeline	🟡	🟡	🟡	📈
Total Sales	🟢	🟡	🟡	📈
Market Share	🟡	🟢	🔴	📈
Top 100 Customers as % Total Sales	🟢	🟢	🟢	📈

Consider the use of alerts, positioning, colours and fonts carefully. Be aware though when using traffic lights or RAG statuses that 6% of the population are colour blind. Spark lines, small word sized single series line charts, can

be useful to show trend information when used in combination with alerts and other tabular information.

Carefully consider whether to use advanced visualisations such as maps, treemaps, network diagrams, tag clouds, scatterplots and bubble charts since incorrect usage can lead to confusion.



9. Interactivity

How the users interacts with dashboard is very important. The user friendliness of the dashboard will determine whether or not the user wants to return to application in future. The most practical advice is to keep it simple. Whilst there will probably be some need for interaction, it is important not to make things too complicated – the last thing you want is a call from the Chief Executive because he's lost track of what he is looking at or cannot find how to navigate back to a view he was looking at previously. Remember too that the dashboard isn't supposed to be a tool for slicing and dicing the data in every which way to answer any given question. The response to the questions below will help determine the level of interactivity:-

- Is it possible to drill down to more detailed data?
- Does the consumer need to interact with the data?
- Can consumers easily share information and collaborate?

If the answers to the above are positive, you should consider building in flexibility to allow the dashboard to become relevant for different users. This will almost certainly include the use of filters, but the ability to save views or tag or annotate items should also be considered

10. Dos and don'ts

Finally here are a few dos and don'ts to consider when designing your charts and tables:-

- Remove elements that are decorative or ornamental. Glossy 3D effects and colour gradients might look nice, but they can be distracting and add nothing of value to the chart
- Increase the data to ink ratio by making every pixel work hard to tell the story
- Maximise the contrast between your data and the background by having a white plot area and subtle gridlines
- Don't rotate axis labels wherever possible as it makes it more difficult to read and draws attention away from the data
- Don't add smoothing to a line chart series as it gives the impression of data points that are not there
- Where it makes sense to, make sure you add structure and clarity to a chart by sorting a metric – for example a bar chart showing competitor sales should be ordered by volume (see right)
- Don't repeat yourself – for example don't include both a title and legend in a single series chart (see right)
- Don't vary colours by point as it raises the importance of brightly coloured data points (see right)
- Use colour variants if you are using multiple or stacked bars, but avoid using a mixture of bright colours and more natural tones as it will emphasise the data points with brighter colours
- Remove table gridlines, display as few numbers as possible and use consistent row and column sizes



We've now been through our ten point guide, and you should now be equipped to build a leading practice dashboard. We hope we have provided practical advice on:-

- Knowing your audience, understanding their needs, and the added value of the dashboard
- Designing a dashboard that is suitable for your organisation
- Building a great looking dashboard that meet the needs of its consumers

If you're interested to know more, please contact us:-



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