The Red Book of **Dashboard Design**

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INTELLIGENCE

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Dear analyst, business user or data-driven management enthusiast: The following best practices have been collected from the accumulated experience of the Sweetspot management team across all industries, as well as documented advice of selected business intelligence and data analytics professionals.

Not only do we believe that respecting such best practices will make your enterprise dashboards more efficient and impactful, but we are also certain that it will get you one giant step closer to building a truly data-driven organization.

This Red Book is structured as follows:

1

Drawing the line between your data analysis and data delivery layers

Beyond the data discovery tasks performed by analysts and "power users" on a daily basis, a strong need for a stand-alone reporting and insight delivery layer arises when an organization reaches the point of maturity that calls for the widespread availability of data at every level of decision-making.

It is then that mere consumers of insights and status updates adopt a primary role in the data-driven organization, exposing the importance of data governance and efficient information delivery.

After all:

a) Business stakeholders do not often find the time or drive for the insight discovery process, as a result asking for straight facts and quick answers instead of powerful slicing-and-dicing capabilities

b) Everybody will consume data in a different manner, with people closest to specific tasks demanding real-time updates on process-specific measures and those higher up the chain (and closer to business objectives) requiring clear insights through considerably fewer, more meaningful metrics.

This information delivery layer could consist of:

1. Status updates. This is the traditional scorecard. It can be automatically updated at the very time that the new data arrives (i.e., start of the month for monthly data)

2. Status updates + quick first answers. This is the basic dashboard, where Key Performance Indicators ("KPIs") are accompanied by charts that bring breakdowns ("dimensions") into the picture as a pre-defined first answer to the questions arisen from the status of such KPIs.

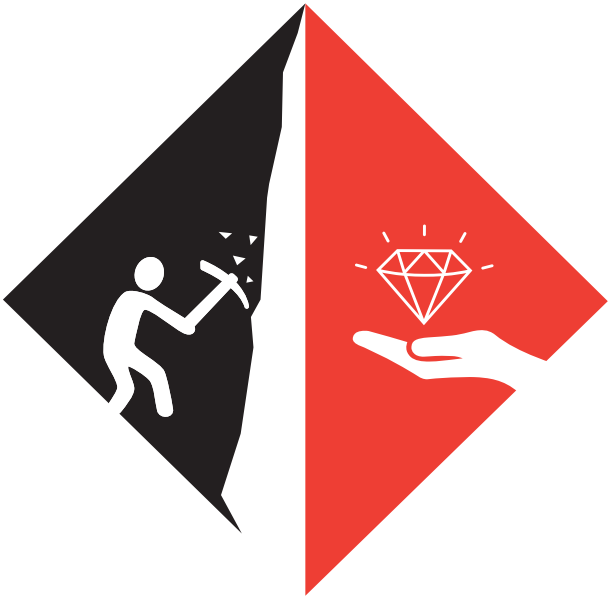
3. Enriched dashboard. This is the asynchronous dashboard, where data and visualizations are subsequently accompanied by the thoughts or opinions of analysts.

4. Workflow-powered dashboards. Beyond textual aids, these dashboards will incorporate suggested actions, assigned to specific team members in a particular sequential order.

5. Ad hoc, manual storytelling. Stand-alone reports where visualizations and the distribution of metrics are specifically tailored to the current "shape" of data will

in certain cases be demanded. These could take the form of infographics or combine multiple perspectives of the same metrics/dimensions in the most effective way to get the message across.

It is the purpose of this Red Book to focus on the first four elements in this list under the generic label of "the Executive Dashboard", as all of them can be easily subject to automation/distribution and all of them have become essential blocks of the corporate data governance process. Even more specifically, our accent has been put on marketing data, which narrows down our target to "the Executive Marketing Dashboard".



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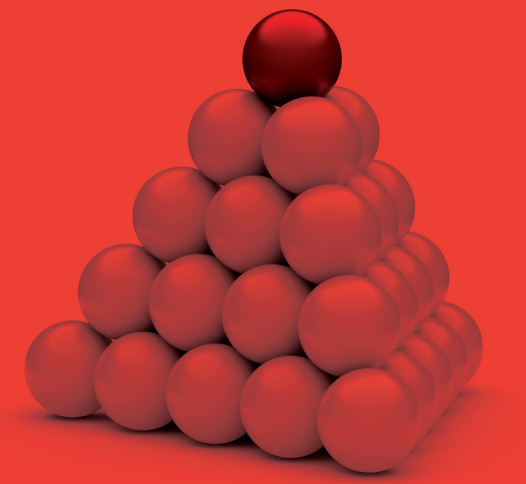
Mapping business objectives to KSIs, KPIs and charts



Information delivery (or even "enterprise reporting") is not about entertainment. It is about meeting our objectives through data. Organizations are on a mission to be more profitable, sell more, increase their market value, cut costs, deliver the best possible customer service, etc. Since each process should be feeding into that mission, we should be capable of building a cascading structure of scorecards/dashboards that represents the backbone of our data-driven muscle.

A focus on performance is achieved when that backbone is in place. Only then do dashboards or reports allow Key Performance Indicators ("KPIs") to rule over graphs, tables or ad hoc storytelling. Only then does every possible vehicle for status updates and insight delivery become truly scalable.

To this avail, a few recommended steps:

1. Each direct business objective will point directly to a KSI (Key Strategic Indicator) with its own goal. The inclusion or not of these KSIs in a given dashboard is another matter.

2. Any tactical or operational metric that feeds into your KSI is a good candidate for a KPI (Key Performance Indicator), so you will most likely require two or more KPIs to show how close you are to meeting a business objective.

3. Most KSIs or KPIs require context. Something is wrong when you are piling up more than four metrics within the same logical unit (we will discuss tabs and *panels* in Chapter 6), as you will barely be able to provide context for all of them, and they will most likely not share the same level of priority.

4. Do not hesitate to define a brand new metric if all you want to report is the relationship between two or more pre-existing KPIs.

   Example: Reporting on "cost per engaged visitor" may be a better choice than the inclusion of two separate metrics covering "cost per visitor" and "engagement ratio".

3

The enterprise challenge: Implementing a hierarchical dashboard ecosystem

Consider the following whenever you are planning to involve separate departments in your decision-making scenario:

1. No two people share exactly the same mission in an organization. As a result, sharing an entire dashboard across all departments is a recipe for failure. Everyone will still be looking to identify the few metrics that affect them directly in their day to day, while the dashboard continues to grow in size and ineffectiveness.

2. The dimensions in your segmentation charts or graphs may very well represent top-priority KPIs for people reporting to you.

   Example: Individual *online sales* and *distributor sales* KPIs will preside over the respective dashboards of the E-Commerce and Channel Managers. In a CEO's dashboard, however, they will remain mere dimensions in a chart that accompanies a Sales KSI.

3. Do not attempt to control KPIs or tables that are better run by the departments or people directly involved with their ongoing performance. Try nesting them or referencing them instead.

   Example: If, as a CEO, the need to know how the top ranking product lines are performing on your website is imperative, try linking to the KPIs and tables that your E-Commerce Manager keeps in her own dashboard.

4

Sizing, assigning and grouping dashboards

A key element of the enterprise dashboard ecosystem is the user-specific scorecard/dashboard selection menu. Only through an appropriate grouping of KSIs, KPIs, charts and tables do we ensure maximum effectiveness of the reporting and insight delivery environment.

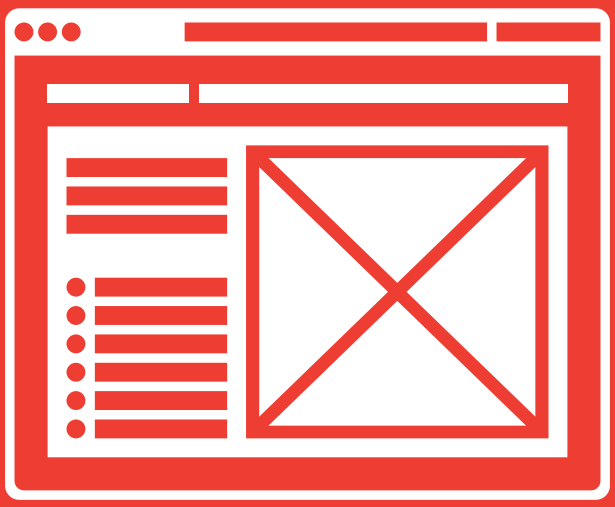
Therefore:

1. Make scrolling your enemy. Scrolling is the exact opposite of finding insights at first glance, so try using multiple dashboards instead. Yes, a strong case can still be made for scrolling when it comes to providing context or a "quick first answer", but this can only be accomplished through charts. Not through additional KPIs.

2. Use dashboard tabs rationally. There is a fine line between using separate dashboards and dashboard tabs within a same visual display. As a rule of thumb, all elements in a dashboard share a common purpose (or business objective) that applies to various brands, digital properties or countries. The brand/property/country variation is a great candidate for the use of tabs.

5

Sketching the visual distribution of elements in each dashboard



Visual balance is imperative if you want to get the message across. At the same time, leaving a dashboard at the sole mercy or aesthetics will hamper its ability to drive performance.

Try the following:

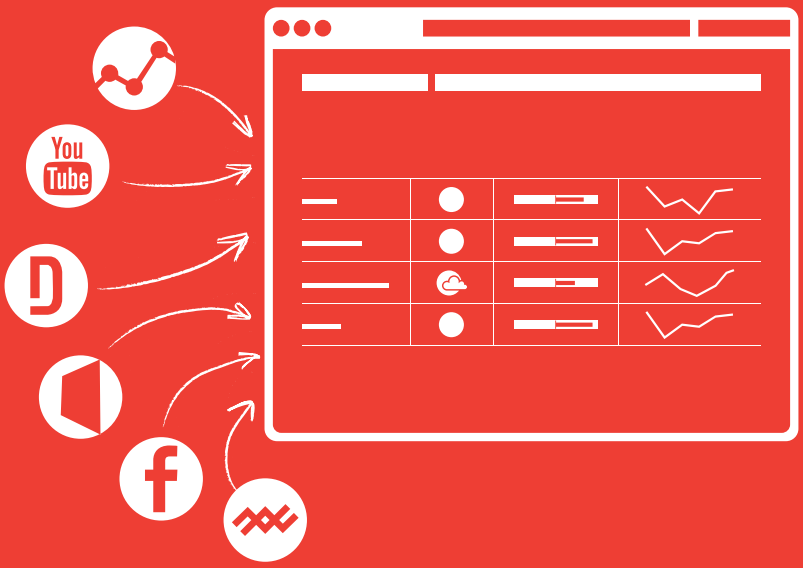
1. Let your KSIs or primary KPIs take precedence over other elements in your main view, choosing a big size (or full width) to ensure that they capture most of your attention. A killer dashboard will be able to place the crown on a single metric.

2. Immediately break them down through tables or charts.

3. Group lower priority KPIs in subsequent views or tabs, in this case choosing a smaller size to make room for equally insightful graphs or tables too.

6

Automated updates: Using panels for consistency



Panels are clusters of of KPIs and tables joined by something more than the common purpose that has already put them on the same dashboard: They are to be updated together with a shared frequency that creates important dependencies at data collection level.

As direct consequences:

1. While it is tempting to match panels and dashboard tabs, you should refrain from doing so. Tabs represent visual associations, whereas panels produce stronger bonds. Data will be loaded and rendered simultaneously within a panel.

2. Identifying applicable data sources is a compulsory step prior to translating your dashboard sketches into panels. Ensure that every KPI, table or chart in a given panel will be refreshed with exactly the same frequency.

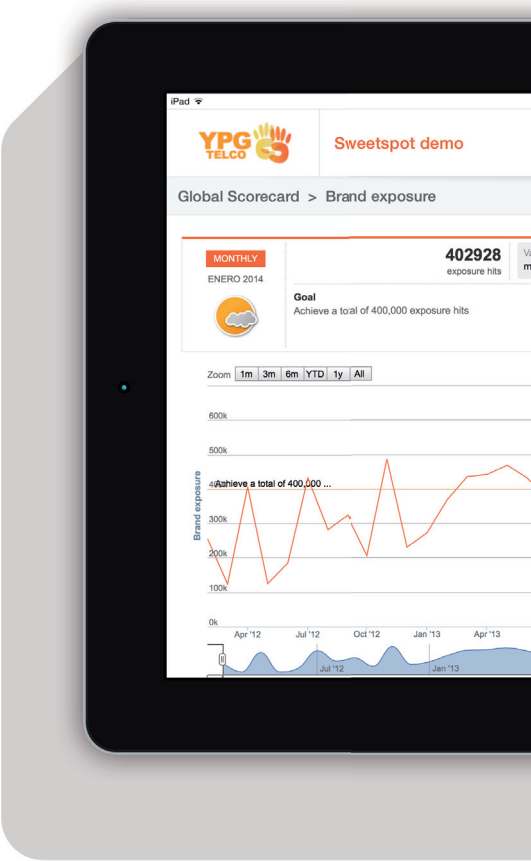
7

The world in a KPI: Metrics, goals, alerts, status, trend and predictions

KPIs (and KSIs) carry the most important pieces of information within your dashboard. Even when you have very clearly decided on what you want (and after you have followed the steps covered in prior chapters), an effort to make them actionable is imperative.
Six elements must be specifically addressed:

Metric definition: There is hardly ever a technical limit as to how many data sources you can mix together when defining the perfect metric. There is however a statistical one to the manner in which they are combined and, of course, you should respect arithmetics.

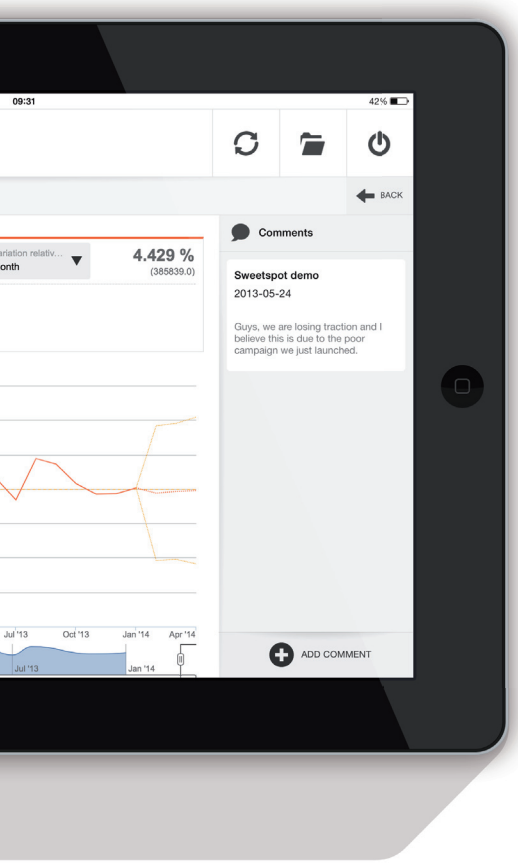
Example: If "raising brand awareness" is your objective and *social brand audience* is one of your KPIs, you may want to simply add Twitter followers, Facebook fans, Youtube channel subscribers, LinkedIn Group members and Instagram followers. However, you may also choose to build a more refined KPI where each social network is weighted based on their strategical importance and the different levels of interaction available.



Setting goals: There is hardly a better way to see how your KPIs are performing than defining meaningful goals and evaluating how close to meeting them you are. When it comes to the hard task of distributing KSI goals between multiple department-specific KPIs, try to:

a) Represent the potential of each team member's contribution to the common goal for the stated period of time

b) Stick to goals that are achievable on the basis of the user's sole efforts.



Defining alerts: Alerts are your insurance policy. Not only can they protect you against circumstances that may arise, in which you do not achieve your goal, but also when one of your metrics is falling below the acceptable threshold. Since such threshold is often left undefined (and we tend to think in positive and aspirational terms instead), try asking yourself: How far would this metric have to move away from my goal in order for me to lose my job? In the absence of other criteria, this will definitely work!

KPI status: Your enterprise dashboard will always show a KPI's current status along with its most recent value. This status is calculated against its prior value, although it may also be configured to depend on the general evolution of the metric over time, or even versus "this time last year".

Trend: Since every KPI will show a detailed trend when clicked or selected (together with the timeline and workflow events that have impacted on this trend over time), you must consider the benefits of displaying such KPI historical evolution on the dashboard's general view. This will add to the amount of information your brain has to process. As a general rule, do not use it if you are grouping together more than 4 KPIs.

Predictions: As you would expect, predictions rely on past data. Avoid cluttering your dashboard with predictive indicators (based on time-based series by default in Sweetspot, for instance) if you do not have enough historical data to grant statistical significance.

8

Charts

Insofar as they provide the most immediate context for a KPI (or KSI), and a quick first answer to whatever question it invokes, charts define the very essence of a dashboard (which in their absence remains a "scorecard"). They can, however, come in many flavors, and the following types are particularly suited for the enterprise scenario at hand:

Table

Either as a simple distribution of rows and columns, or with complementary visual aids (such as overlaid "bubbles"), tables are the most straightforward way to represent a segmentation. In particular, they are very well suited for:

- Access to individual values across different metrics
- Simultaneous comparisons of multiple metrics.

Scatter chart

Scatter charts use Cartesian coordinates to display two metrics and the way in which they jointly affect all values in a selected dimension. They can prove very powerful when it comes to revealing patterns and relationships between the values being displayed.

Funnel

Funnels show a sequence of events (and corresponding metric values) in proportional or static funnel shape. They are very effective in the representation of marketing and sales cycles (eg.: a breakdown of online sales events as a companion to the *conversion rate* KPI).

Pie chart

Although their effectiveness is highly dependent on the actual data being displayed, pie charts can make it easy to understand the relative proportion of different dimension values (represented by sectors in a circle graph) under the light of a single metric.

Combo charts

Combo charts can also prove to be a very powerful visualization tool, combining different elements such as columns, lines, splines, areas, stack columns or stack areas within the same graph. Combo charts can work very well for simple comparisons, correlations, distributions, trends and deviations.

9

Intertwined KPIs, panels and dashboards in the enterprise environment

You are probably familiar with a complex cross-departmental scenario where various forces are at play forging a delicate balance between extreme flexibility and maximum scalability:

a) Everyone needs the data that is most relevant to them, albeit ensuring that it "inherits" a common corporate or departmental language

b) Similar departments in other business units will be eager to reproduce a set of metrics similar to those already in use

c) KPI definitions should remain flexible enough to adapt to ever-changing circumstances

d) The longer a set of KPIs stays in place, the easier it will be to arrive at meaningful conclusions and the more accurate future predictions will become.

Insofar as dashboard design is concerned, a few best practices will allow you continuously achieve the maximum level of organizational scalability while benefiting from highly customized KPIs and tables:

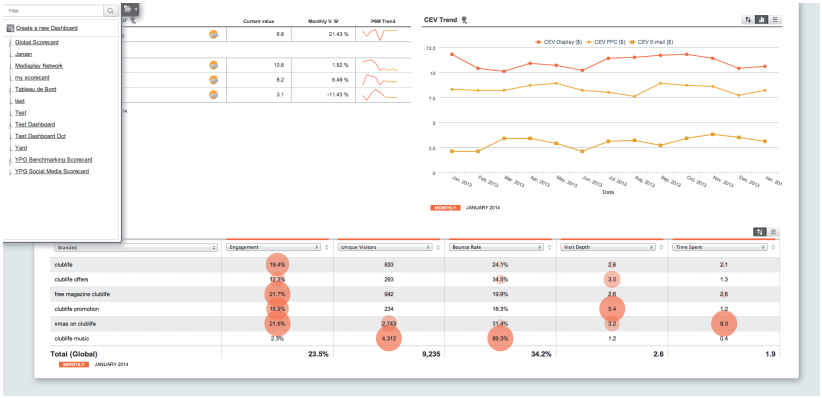
1. Build KPIs with "instantiation" in mind: Considering the wider picture and other potential scenarios for their inclusion. This will expand the chances that other people in your organization recycle pre-existing KPIs in your library instead of starting again from scratch.

2. Define panels (or logical groupings) with an eye on enterprise-wide decision-making scenarios. They may very well become *panel templates* further down the line, greatly simplifying dashboard replication.

3. Avoid re-defining metrics already chosen by other departments or stakeholders. Everyone will benefit from an attempt to agree on a common definition, followed by clear ownership policies, and in-dashboard linking (as explained in 3.3).

10

Transforming your enterprise dashboard into a (limited) data analysis layer: FOUR TIPS



Ok, you may after all not have listened to any tips given before, during or after you decided to deploy an executive dashboard ecosystem. Corporate information delivery tools were never built to replace the analysis layer. Nor were they conceived to become an alternative to data visualization tools for the analyst and data scientist. Or even to compete with *plug-and-play* operational dashboards that serve the independent professional by automatically "spitting out" the most common metrics associated with each pre-defined source.

There are however certain instances in which all attempts to build a multi-source analysis layer leave you in the deadly no-man's land of company-specific, highly-operational aggregate reporting. Don't despair, however. In this case an enterprise dashboard can pull you out of the trenches and drive you to victory. This alternative need may arise where:

- Data integration between isolated analysis tools is technically or legally impossible (aggregation becomes the only option)
- Current medium-specific analysis tools are extremely slow, complex or hard to use.

You would however need to bear in mind the following:

FOUR TIPS

1

Consider that every data category in your current analysis layer will require an existence of its own, in the very same way it has been separated from the rest by your original source (it is probably no coincidence, and you must bear in mind that your dashboard will be tapping into an equivalent underlying infrastructure)

Example: Use a separate "technical metrics" dashboard to group *top browsers*, *top devices* or *average load time* when getting data from mobile and web analytics platforms. Do not mix them with "conversion metrics" under the same dashboard.

2

Remember that data has never before been married between the different analysis tools now integrated. All efforts to present a "single view of the customer" or customer-level information will be futile. You may need to choose correlations instead.

Example: Social media and website traffic metrics can hardly be integrated at individual ("visitor") level. The most value you will get out of a common repository is a correlation of, say, *engagement* and *free branded traffic*.

3

Avoid an overload of metrics or table dimensions at the same visual level. Chapter 5 is equally applicable to analysis tasks (you are still human).

4

Leave historical metric trends to the specific drill-down available for each of them, instead of cluttering the general dashboard view with a collection of unrelated trends.

FINAL NOTE

As an addition to everything we have said throughout this Red Book, please consider the following underlying ideas:

- Dashboards are meant for human beings, with our limitations when it comes to processing information, and our unique combination of logical and creative skills when it comes to making data-supported decisions.
- Nobody works in isolation. A common corporate language is required (and yes, various languages could happily coexist).
- *Producers* and *consumers* of metric updates or data insights play entirely separate roles. Enterprise dashboards exclusively serve the latter, but they will also save data analysts invaluable time, allowing them to focus on their primary purpose.

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