# Abstract

With my limited years of career as a Data Analysis professional, I’ve seen so many organizations are not utilizing their reports or dashboards. In fact, oftentimes, people build all kinds of ad-hoc reports just to illustrate the same thing over and over.

With that being said, I’d like to share a little bit about my personal Report Building ideology, which I found useful on report user retention. I mean, if my reports are getting the most attention and retention, that means I can lay back and relax more often while becoming more important. Who doesn’t want that?

So let’s dive in.

# Step 1: Draw Out the Question

I see so many reports being reworked over and over again due to a lack of this step. I admit, when I first started my career, I made the same mistake. With all the cool visualization tools out there, Power BI, Tableau, or QlikView, I wanted to put everything I know about the subject into the dashboard. I wanted to build the best, the most informative, and the most sophisticated dashboard so that I could show off my skill and looked smart. But the fact is, you can build the most sophisticated kitchen knife that can do many things, but if that knife can’t even cut a vegetable properly, it is not a good kitchen knife.

The same thing applies to Dashboard Building. If I know the purpose of my dashboard is to do ABC, then everything in this dashboard is better evolving around ABC.

1. I mentioned it many times, and I will keep saying this until everyone remembers it. We need first to define what the question we are trying to answer. This step will set the direction of this dashboard. For instance, when I was questioning how I could reduce my Azure cost, the number of cars produced probably wouldn’t help.
2. Once the question is defined, on the first page, we want to have three things upon landing:
   1. What is the current status of that question? (Focus point).
   2. Were we like this before? (historical)
   3. What are the difference makers? We need to have the most influential attributes (top three) considered here.

# Step 2: Outline the Report Structure

If you are a dashboard designer, you probably heard the phrase “*Story Telling*” a billion times. For those who don’t know, long story short, “*Story Telling*” is how to present your dashboard in a *Logical* way. I know a lot of you are very smart. Many conclusions are very intuitive to you. However, when you stand in a report consumer’s view, it may not be that clear after all. This is where you need to *Guide* them and let them *find* the answer in your dashboard/report.

To do this, we need to draw out an outline based on the outcomes from Step 1:

1. We need to have a Landing page that tells us what the focus point (the question we are trying to answer) is on this dashboard. Is that a problem now (compare to before)? If so, what may be the top causes for that problem?
2. Once we know one attribute that is causing the issue, we need to have a dedicated page for that attribute. And yes, we need one page for each attribute if there is more than one. The goal for the second page is simply to generate more detailed questions or answers around that specific attribute.
3. If one layer of detailed information is not enough, we will redo bullet point 2 and have one more layer of information until all the questions are answered.
4. Have a page of raw data in the end so that if the end-user is questioning the data integrity, they can do a self diagnose first.

I will use a capacity planning dashboard as an example:

What is causing throttle of my capacity?:

1. What is our ideal capacity?
2. What is our current capacity?
3. What is causing our capacity changes (increase/decrease):
   1. Labor
   2. Materials
   3. Market

With this structure in mind, I will design my dashboard with 5 (6 is optional) pages:

1. Landing Page – Answers the question: What is causing the throttle of my capacity?
2. Labor Page – Answers how does labor throttles my capacity?
3. Materials –Answers how does Material throttles my capacity?
4. Market – Answers how does Market throttles my capacity?
5. Detailed information – Table of data if the user wants to dive in.
6. (Optional) Q&A –Natural Language Processing out of the box.

# Step 3: Select Visuals

Now we have a focus point and a dashboard structure. Now is time to build the dashboard. One of the other common factors of abandoned reports is some of the visuals are not making sense. If you found yourselves oftentimes struggles on which visual other than *the Table* to pick, this is the section for you.

Personally, I’d like to think of a visual as a dimension model. The only difference would be this model only allows one, or occasionally two fact values. The number of dimensions is defined by how many attributes are allowed by a graph.

Let’s say one visual has *n* attributes available for you to play with. Then you will have *1* fact and *n-1* dimension or *2* facts and *n-2* dimensions. However, there is a magic number of 2 for dimensions. If you have more than 2, the visual tends to be busy for the user. Ie. Combined line chart and bar chart with segmentations.

For instance:

1. A pie/donut chart has two attributes (*value/percentage, and segmentation*). Then *value* will be *the Fact*, and the *segmentation* will be the dimension.
2. A bubble chart can have six attributes:
   1. X-axis
   2. Y-axis
   3. Size
   4. Color
   5. Group
   6. Time (play axis)

Where Both Size and Color can be serving as facts. However, I do recommend only use size as the Fact.

1. The table visual is the only visual that can represent as many attributes as possible, but it is also the busiest one.

With that being said, everything on the same page is recommended to have the same Fact for unified information delivery. (exceptions may apply.)

# Step 4: Assemble