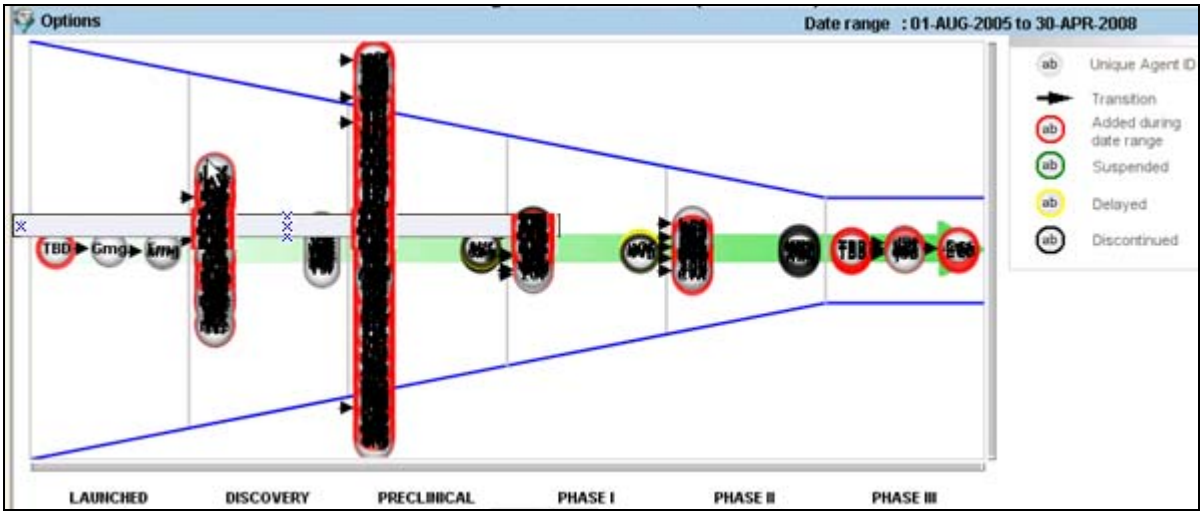
discovery information

Design, Vision and Visualization
IEEE Visualization 2008 Workshop Design Example Submission

Historically, big pharma decision makers comparing competing products (therapeutic drugs) have used the "funnel chart" to depict the status of competing drugs in the various drug development stages; the later the stage, the fewer drugs per stage. The funnel metaphor (blue lines in the sanitized diagram below) were added to emphasize this, and the decision makers were happy. Unfortunately, the solution (originally hand-built) is neither scalable nor addressed well by modern plotting tools, for the following simplified design criteria:

- Show time progression and development stage (Discovery to Launched)
- Show each competitor clearly, without occlusion, within the funnel bounds
- Adorn competitors with state information (color, line, etc.)

This diagram shows a result from a custom-designed web application that tried to honor these criteria.



Thus the problem was to rework the visualization to show something that the decision makers could use to make informed decisions. The result is shown in the second diagram using the Spotfire DXP tool. It first required the abandonment of the funnel metaphor, as it was useless; this immediately opened up more possibilities for design solutions.

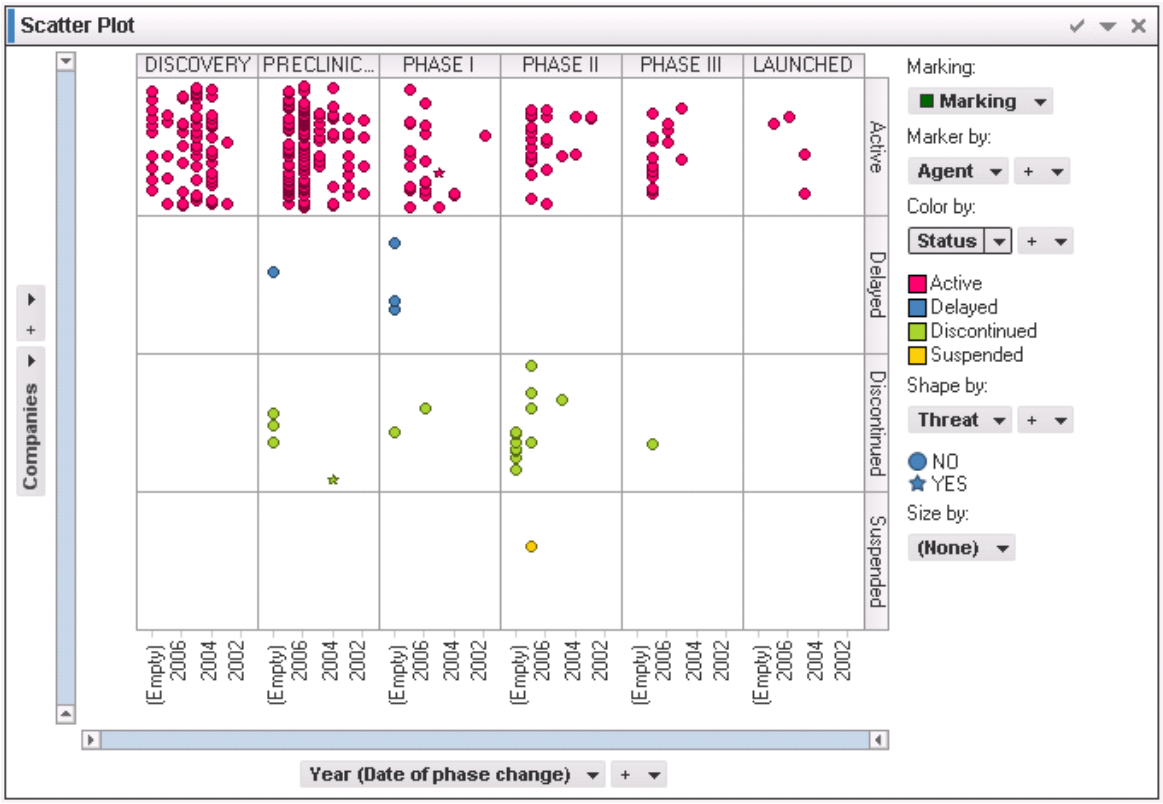
The most important design criteria was to make the individual elements seperable, so they could be viewed, compared, and drilled-into for addition al detail data. By applying the concept of small multiples, and using the trellising feature of Spotfire DXP, we were able to partition the information space on several dimensions to yeild acceptable results for most data sets.

We were hampered somewhat by the lack of a "space filling" element placement algorithm, which would have easily satisfied the non-occlusion criteria, so we had to find some pair of dimensions that would separate the elements. *Companies* versus time gave us an acceptable result. We use color redundantly with one of the trellising parameters (*Status*), and shape for the binary dimension *Threat*.

Naturally, there are areas where the general purpose tool comes up short. Aside from the lack of a space-filling element placement, label placement (for drug name) was not useful – we resort to labels upon hovering over elements.

AstraZeneca

In summary, a combination of denying a favorite, but entirely useless, visual metaphor with data set partition and redundant visual mappings enabled us to design a useful visualization with minimal effort, using a commercial general purpose visualization tool.



Distilling a design problem that could be potentially complex (and complex in practice in this example!) through a few basic rules:

- remove gratuitous graphical elements
- use small multiples wherever possible
- explore dataspace partitioning
- add redundant mappings

Can result in a successful visualization that can be used to gain insight and make informed decisions.

Respectfully submitted August 4, 2008 by

John Peter (JP) Lee
Scientific Information Services
AstraZeneca R&D Boston
Waltham, MA 02451
781.839.4575

jplee@astrazeneca.com

AstraZeneca