**Over All Process**

Show version 3

As talked about during the couple papers on 29 Oct like The Challenge of Information Visualization Evaluation. We need to think about how we are evaluating our designs and visualizations and match the tools to users, tasks and real problems. Combined with some of the approaches taken in the Empirical Studies in Information Visualization: Seven Scenarios paper. We took an iterative approach to our design with Pre-design, design, prototype, deployment, and re-design. This involved showing our designs / prototypes at various stages to colleagues at work and academics at the university to gain their feedback and incorporate their perspective into what you see today.

**Layout**

In the course we’ve touched many times on the cognitive aspect of visual analytics from the first paper by Ivan Herman to the recent papers on sense making and insight. These all played a role in our evolution of the layout part of the visualization.

Show version 1

Our layout design evolved significantly after we spoke to different users and academics. The common thread between them was they had a hard time relating the mental model they had of the problem to the visualization. After Eric and I reflected on the comments we realized we were really dealing with a typical demand / supply problem. We then took this information into version 2 by creating 2 columns, one for demand and one for supply.

Show version 2

This new layout was much easier for users to understand. It also allowed them to conceptualize where they were in the flow of solving the problem. It also made it easier to explain the different perspectives you could view the problem by therefore allowing users to explore a specific facet of the problem without losing focus on the overall problem space.

The layout further consists of different views into the problem. Currently, we have the organizational view, the process view, and the redundancy view. This allows the user to explore the problem anyway they like. It also gives them several options to address the question of “How do we support decision makers to minimize negative side-effects from organizational change?” by understanding the impact and if required redistribute work based on available supply.

You will also notice that as you navigate around when you select an item in one panel all the other panels update to reflect the chosen data point like a brushing scatter plot.

Another important point mentioned in the Towards the Understanding of Interaction in Information Visualization paper by Ana Figueiras that we incorporated was history. The paper quotes a great line: “Information exploration is inherently a process with many steps, so keeping the history of actions and allowing users to retrace their steps is important”. This is where you will find the history drop down and the history options on the navigation bar. Eric will discuss this further and other details about the organization view.

**Process View**

Show version 1

Originally in version 1 we modelled the connection between users as a treemap to show the relative size of communication between the selected users and other users they communicated with. Once again, we found users had a hard time understanding this information since it didn’t show how it passed from one employee to the other and where the selected employee fit into the flow. We originally chose this approach based on the Ben Shneiderman paper as we liked the space filling idea. Given the limited real estate on the screen and the fact many users could have large numbers of connections made this appealing.

Show version 2

We solved this by removing the treemap and replacing it with a Sankey diagram to show flow from emails coming into a selected employee and emails flowing out from the selected employee. Users found this better related to their mental model of the problem, however the way the traditional Sankey diagram laid the information out made it hard to interpret and gave a false flow from right to left that had no meaning.

Show version 3

This lead to the design in version 3 where each employee that interacts with the selected employee is lined up equally on the left and right-hand side of the screen. As well their flow through an individual is lined up on the selected node. The lines are also color coded to draw the users attention to processes that start or stop with a given individual. You can further highlight a given flow by hovering over the line to make it more salient to the user and allow them to focus on that specific piece of information.

We also had a lot of discussion around the size of the graph since a given user could have many connections. We decided to keep it to direct connections with the existing user and add the pan and zoom function as discussed in the Graph Visualization and Navigation in Information Visualization paper. Since we spent a lot of time laying out the diagram in a specific way it does not include any reordering and moving functionality like a traditional Sankey diagram.

This comes together to help a manager understand the flow of information through a given individual. This result can be used in the following ways:

1. To determine email chains where the selected employee is a source or sink. These would need to be addressed to ensure information does not go into a dead email box.
2. It can also show links which are strong and might need to be addressed sooner than weaker links.
3. It also provides a high-level view to show the employees contributions / value to the organization.