Think with your eyes:
Considerations when visualizing information
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What is visualization?

“Well, it depends on who you talk to. Some people say it is strictly traditional charts and graphs. Others have a more liberal view where anything that displays data is visualization, whether it is data art or an Excel spreadsheet...in the end it really doesn’t matter that much.

Just make something that works for your purpose.” Yau, N. (2011), p. xxi
Why visualize?

We visualize to help ourselves and others think about and understand information.
Visualizing information

Works best when displaying information as familiar, easy to recognize patterns.

Should allow us to see what is meaningful.

Should allow us to make sense of what we are seeing.

Should help us make comparisons and examine relationships.
Questions to ask yourself

Why am I visualizing this information?

What is the message I want to convey?

What is essential to that message?

Would I lose any meaning or impact if this were eliminated?

Am I emphasizing the most important information?
Quantitative data visualization

Tables are used when
• Individual values are important
• Individual values need compared
• Precise values are required
• Information has more than one unit of measure

Figures are used when
• The message is in the shape, not the value
• Revealing relationships among multiple values

“Graphical excellence is that which gives to the viewer the greatest number of ideas in the shortest time with the least ink in the smallest space.”

Tufte, E., 2001, p. 51
Qualitative data visualization

Qualitative data
- Interviews
- Focus groups
- Open-ended survey questions
- Observations
- Artifacts
- On-line data

Stages of research
- Exploration
- Analysis
- Synthesis
- Presentation

Orientation
- Internal
- External

Interaction with data
- High (dynamic)
- Low (static)

Visualization assists in the entire research process and can be an important part of the researcher’s tool in understanding and gaining insights into their data.
In other words, visualizations used for exploration have high data interaction to personally make sense of the data.

Visualizations used for presentation have low interaction and are primarily for knowledge sharing.

Others fall somewhere in between.

(Image: Damien Newman, Central Office of Design; Bhowmick, 2006)
**Categories of qualitative visualization**

**Text**
Purpose: for content analysis of overall text; to build clusters and hierarchies of similar and dissimilar information
i.e.: word clouds, word trees, semantic networks

**Cognitive**
Purpose: to connect major themes and phrases in meaningful ways; to understand and illustrate the thinking process
i.e.: mind maps, concept maps

**Text and image**
Purpose: to convey messages, tell stories, etc.; layering information, assimilating and presenting information in a systematic manner
i.e.: storyboarding

**Spatio-temporal**
Purpose: to explore, analyze and present qualitative data that changes over space and time
i.e.: timelines, GIS maps

*(Bhowmick, 2006; Slone, 2009)*
Mind map, theoretical map, model (Mind Node)

Word tree (Many Eyes, Nvivo)

Phrase net (Many Eyes)

Research were fairly similar in their views of research but there are some interactions that lead to mistrust as well. All of the organizations were interested and had worked with us in the past. The majority noted that there is mistrust in their communities about research and researchers. 002 researchers do not know the community because researchers may not know the community, the research was often times too slow to be helpful, and that research was often times too slow to be helpful, and that research was overly focused on ideas rather than services. Research often has negative associations in these communities.

Collaborations

Benefits cited were legitimization of the organization or clients' experiences, potential funding opportunities through informal networking.
Tree map (Many Eyes, Nvivo, Flowing Data)

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| Featured                  | Artistic Visualization | Data Sources | Visualization | Infographics |

Word cloud (Wordle)
Limitations of visualizing qualitative data

Limited research, knowledge on visualizing qualitative data

Many tools are too simple to convey message

More complex tools require high learning curve, high cost to use

Many tools rely on quantification of data (i.e. word frequencies or percentages of coverage)

Message may be lost in the transfer

Remember to ask yourself the fundamental questions…

- Why am I visualizing this information?
- What is the message I want to convey?
- What is essential to that message?
- Would I lose any meaning or impact if this were eliminated?
- Am I emphasizing the most important information?

(APA 6th has checklists to help you answer these questions tables, p. 150 and figures, p. 167)
What questions do you have?
Examples

Shape and value
http://www.perceptualedge.com/example2.php

Emphasis and purpose
http://www.perceptualedge.com/example18.php

Confusion and clarity
http://www.perceptualedge.com/example15.php
Resources

Literature

Websites
Perpetual Edge: http://www.perceptualeedge.com/examples.php
Many Eyes: http://www-958.ibm.com/software/data/cognos/manyeyes
Flowing Data: http://flowingdata.com/

Training
Lynda.com: http://www.iastate.edu/lynda/ login with your Iowa State NetID and password