CSE 332
Introduction to Visualization

Infographics Design

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What are Infographics?

A clipped compound of "information" and "graphics“

A graphic visual representations of information, data or knowledge intended to present information

- quickly
- clearly

Can improve cognition by utilizing graphics to enhance the human visual system's ability to see patterns and trends
Graphical displays should

- show the data
- induce the viewer to think about the substance rather than about methodology, graphic design, the technology of graphic production, or something else
- avoid distorting what the data has to say
- present many numbers in a small space
- make large data sets coherent
- encourage the eye to compare different pieces of data
- reveal the data at several levels of detail, from a broad overview to the fine structure
- serve a reasonably clear purpose: description, exploration, tabulation, or decoration
- be closely integrated with the statistical and verbal descriptions of a data set.
Minard’s 1869 map of Napoleon’s campaign to Russia

Shows 6 variables in one 2D visualization:

- number of Napoleon's troops, temperature
- distance traveled, direction of travel
- latitude and longitude, location relative to specific dates
Some More Random Examples ...
The Time We Spend on the Internet

Almost 6 billion people are on social media every single day. The average adult spends more than 20 hours online a week...

We send over 200 million emails per minute. ...

...which includes time spent on the Internet at work.

Stress in the Workplace

70% of American workers experience stress-related illnesses. 34% think they'll burn out on the job in the next two years. 33% more heart attacks are occurring on Monday mornings. 45% of entrepreneurs said they were stressed.

The Average Work Week

The average work week is closer to 50 hours than 40. Professionals who use mobile devices like smartphones tend to work more than 70 hours a week.

You get 168 hours a week. The average commute time is 47 minutes round trip.
WHAT ARE WE EATING?
What the Average American Consumes in a Year

Fats & Oils: 85.5 lbs
Red Meat: 110 lbs
Poultry: 73.6 lbs
Fish & Shellfish: 16.1 lbs
Eggs: 32.7 lbs
Cheese: 31.4 lbs
Dairy Products (non-cheese): 600.5 lbs

Coffee, Cocoa & Nuts: 24 lbs
Vegetables: 415.4 lbs
Corn: 98.5 lbs
Beans, Cocoa & Nuts: 45.6 lbs
Wheat Flour: 18.1 lbs
Beverage Milks: 15.7 lbs
Caloric Sweeteners: 10.6 lbs

The Average American
Age: 36.6
Height: 5'9" (m)
5'4" (f)
Weight: 190 lbs (m)
164 lbs (f)

1,996.3 lbs
EDUCATION AROUND THE WORLD

There are 1.4 Billion students on Earth.

Only 65.2 Million educators globally.

THE CHALLENGE: Too many children remain out of school, and those who are in school aren’t learning the skills they need for life and work.

Children leaving school before completing their Primary Education

- 11.07 Million children leave school before completing their primary education.
- In the Sub-Saharan, 11.07 million children leave school before completing their primary education.
- In South and West Asia, that number reaches 13.54 million.

Children out of primary school

- 61 Million children are still out of primary school.
- 32 Million of these children are girls.

1 in 5

- 15 to 24 years old has not completed primary school and lacks skills for work.

An estimated 250 million children are not able to read or write.

The poorest and most marginalized are the most affected.

In some emerging economies, 3 in 10 youths cannot do basic arithmetic.

Fragile and conflict-affected countries account for more than 30% of all children not completing primary school.

In some developing countries, one quarter to one-half of youth who have graduated from primary school cannot read a single sentence.

OF THE 775 MILLION ILLITERATE ADULTS

TWO-THIRDS ARE WOMEN

Connect. Inspire. Empower.

www.ubuntuemail.com
Studen Bullying

Bullying

Physical, verbal, or psychological attacks or intimidation against a person who cannot properly defend himself or herself. It includes two key components: 1. Repeated harmful acts 2. Imbalance of power

Effects of Bullying

Bullying can have a significant impact on both child and teenage students. Students who are bullied often suffer from anxiety, fear, withdrawal, low self-esteem, and poor concentration. A bullied student will often avoid school, have lower grades, and become socially isolated. There have been numerous reports of suicide due to bullying.

Most Common Types of Bullying:

- Hitting
- Threatening
- Intimidating
- Maliciously teasing and taunting
- Name-calling
- Making sexual remarks
- Stealing or damaging belongings
- More subtle, indirect attacks (such as spreading rumors or encouraging others to reject or exclude someone)

Playground School Bullying Statistics

43% fear harassment in the bathroom at school

Every 7 minutes a child is bullied

Effect on Bullies

Bullying is often a warning sign that children and teens are heading for trouble and are at risk for serious violence. Teens (particularly boys) who bully are more likely to engage in other antisocial/deficient behavior (e.g., vandalism, shoplifting, truancy, and drug use) into adulthood. They are four times more likely than nonbullies to be convicted of crimes by age 24, with 60 percent of bullies having at least one criminal conviction.

Sources:

http://www.cops.usdoj.gov
http://www.keepstudentsafe.org
http://www.bullypolice.org

Produced by: Buckfire & Buckfire PC
http://www.buckfirelaw.com
How To Make Effective Infographic

Five steps (from Venngage.com)

1. Outline the goals of your infographic
2. Collect data for your infographic
3. Visualize the data for your infographic
4. Layout your infographic using an infographic template
5. Add style to your infographic design
Step 1: Outline Your Goals

Use the question pyramid

Venngage.com
Example: Food – Wine Pairing

- Burning Problem: How to pair food and wine
- Supporting Questions:
  - Which food components matter?
  - What are the types/categories of wine?
  - Which category works with each component?
- Probing Questions:
  - Why do certain pairings work better?
We discussed this
Decide what are your primary goals

- what data aspect do you want to convey

The ICORE method

- Inform,
- Compare,
- Change,
- Organize,
- Reveal relationships, or
- Explore.

Venngage.com
Convey an important message or data point that doesn’t require much context to understand.

Make a numerical stat stand out with large, bold, colorful text:

The brain makes
700 neural connections per second before the age of 5.

Demand extra attention by pairing icons with text:

4200 VACCINES ADMINISTERED

Highlight a percentage or rate with a donut chart or a pictograph:

25% WERE CHILDREN

25% WERE CHILDREN
Show similarities or differences among values or parts of a whole.

Use a pie chart, donut chart, pictograph, or tree map to compare parts of a whole.

Use a stacked bar chart or stacked column chart to compare categories and parts of a whole.

Use a stacked area chart to compare trends over time.
Show trends over time or space

Use a line chart or an area chart to show changes that are continuous over time.

Use a timeline to show discrete events in time.

Use a choropleth map to show spatial data.

Use a map series to show data that changes over both space and time.

Venngage.com
Use a list to show rank or order when you want to provide extra information about each element.

Use a table to show rank or order when you want readers to be able to look up specific values.

Use a flowchart to show order in a process.

Otherwise, show rank or order with a bar chart, column chart, bubble chart, or pyramid chart.
Reveal more complex relationships among things.

Use a scatter plot when you want to display two variables for a set of data.

Use a multi-series plot when you want to compare multiple sets of related data.
Add interaction

- filtering, sorting, and drilling down
- can’t do with a static chart
- but useful for online infographics displays
- will discuss later
Create a natural flow

- could use the question pyramid to guide the layout
- burning question into header
- follow with charts to address the supporting questions
- finish with the probing questions

Use a grid layout

- guides the reader’s eye
- symmetrical grid
- consider that people read
  - top to bottom
  - left to right

Venngage.com
One Column for Linear Flow

Venngage.com
Two Columns for Comparisons
Who Said What?

Democrats
- Character: 11
- Jobs: 14
- War: 9
- God: 6
- Hurricane: 8
- McCain: 18
- Iraq: 12
- Change: 24
- Economy: 16

Number of times words were used

Republican
- God: 25
- Character: 14
- Energy: 18
- War: 18
- Bush: 6
- Economy: 18
- Terror: 12
- Jobs: 8
- Iraq: 15
- Tax(es): 22

The Words They Used - Graphic - NYTimes.com
Three Column Example

**CLEAN WATER SYSTEMS**

- **2.64 Billion** people around the world do not have access to adequate sanitation.
- **780 Million** people do not have access to improved water sources.
- **Every $1** spent on water and sanitation generates at least $4 in increased productivity.

*Source*
Multi-Section Layout For Random Visual Access
### Overall goal
- make your infographics aesthetically pleasing
- make it easy to consume and understand

### Minimize text
- should supplement the visuals
- short paragraphs (at most) at about a grade six reading level

### Use font to point out importance
- readable font for the bulk of the text,
- amp up size and style of your main header, section headers, and data highlights
- make sure that the gist of your infographic is immediately apparent
Example

Reducing Poverty

We're active in over 100 communities in Georgia alone.
And we serve over 4 million Georgians each year.
In 2017, the total investment amount was $132.7 million.

Find out how you can make an impact today

Reducing Poverty

We're active in over 100 communities in Georgia alone.
And we serve over 4 million Georgians each year.
In 2017, the total investment amount was $132.7 million.

Find out how you can make an impact today

Reducing POVERTY

We're active in over 100 communities in Georgia alone.
And we serve over 4 million Georgians each year.
In 2017, the total investment amount was $132.7 million.

FIND OUT HOW YOU CAN MAKE AN IMPACT TODAY
Repeat basic shapes to reinforce the underlying grid
Emphasize Using Shapes

Use basic shapes to emphasize headers and list elements

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Add icons to reinforce important concepts in the text

- keep icon color, style, and size consistent
- pull everything together with extra background shapes

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BE Diligent

Make sure the repeated elements you add are aligned!

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Negative Space

Negative (white) space is often used in advertising

- the space around and between the subject of an image
- helps to define a subject
- helps emphasizing a message
NEGATIVE SPACE IN INFOGRAPHICS

Just as important as any other element of a design

- simplest negative space are margins around the graphics

Venngage.com
Negative Space: Gaps

Use gaps between unrelated elements

- makes it easier to immediately understand which elements are grouped together

Venngage.com
Much easier to make colors play nicely with each other by adding a little whitespace
Use color to highlight important information
Color for Grouping

Use color to group related elements together
Neutral Colors

Use neutrals to offset bright colors

- helps put together a composition
- can group in a more subtle way
There are Templates on the Web