

Interactive Data Graphics

- What is understood by the term interactive?
- What does interactive graphics mean?
- Interactive graphics
 - Principles
 - Practice
 - Particulars

Interactivity in software

- PRIM9 (see stat-graphics.org/movies/prim9.html)
- Excel
- Data Desk, JMP, ViSta
- ggobi
- R
- MANET, Mondrian, GAUGUIN, SEURAT
- iplots
- iPhone, iPad, ...

Dynamic Graphics (are ≠ interactive graphics)

- Changing point sizes
- Altering levels of alpha-blending
- Animation through categories
- Animated zooming (including censored zooming)
- Varying binwidths and other parameters
- Sliders
- Rotating plots
- ...
 - Movement not interaction

Example: Oscar survival data

- Redelmeier and Singh (2001)
- Survival distributions of Oscar-winning actors and actresses (and of nominees)
- Comparisons with others in the same film
 - Six binary variables (e.g., gender)
 - Birth and death years
 - Nos of films, nos of wins/nominations
 - Years of first film/nomination/win

R or Interactive Graphics

R

Summary statistics

- means, sds, quantiles
- frequency tables
- correlations

Graphics

- single plots
- several plots one window
- small multiples

Models

Mondrian

Graphics

- multiple plots
- multivariate plots

Interaction

- querying
- linking
- zooming
- varying
- reordering

Interactivity hierarchy

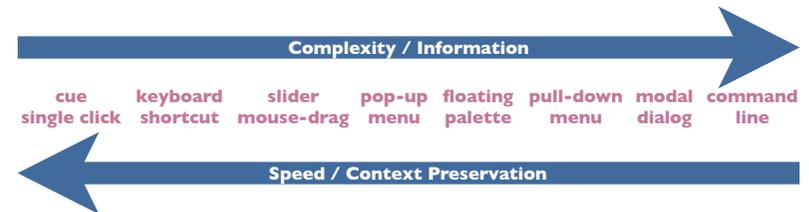


Fig. 4.11. Hierarchy of user interface controls according to their information content, complexity, speed, and context preservation.

Ideal is direct manipulation of the data objects and statistical objects with immediate response

IG Advantages

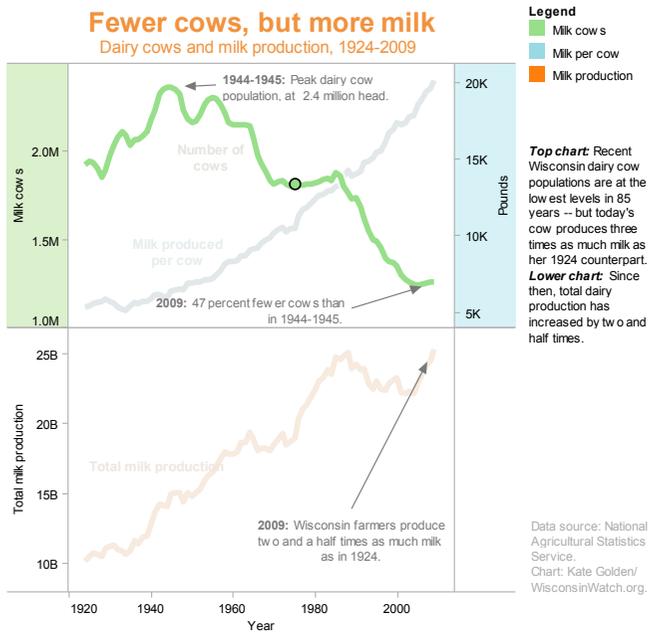
- Direct querying
- Multivariate information via linking
- Fast, flexible analyses (including sensitivity analyses)
- Running through alternatives quickly
- Experimental reformatting
- Versatile reordering
- Generate ideas/hypotheses
- and
 - not letting computing get in the way of thinking

IG Disadvantages

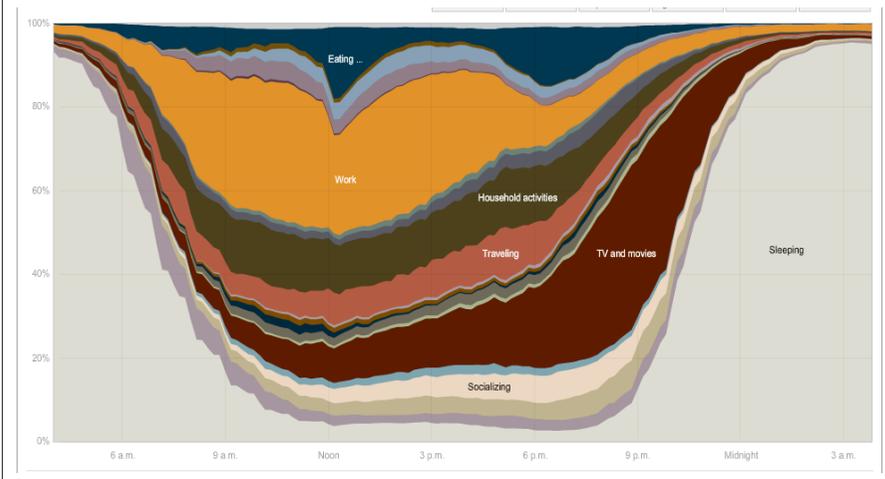
- Not mathematically defined
- Difficult to record the process
- Cannot replicate analyses
- Difficult to save results of analyses
- Can often not test results statistically
- Not presentation graphics quality
- Data dredging: you always find something

Fewer cows, but more milk

Dairy and milk production, 1924-2009



How Americans spend their day (1)



How Americans spend their day (2)

