VISUALIZATION DESIGN PROCESS

SKETCHING

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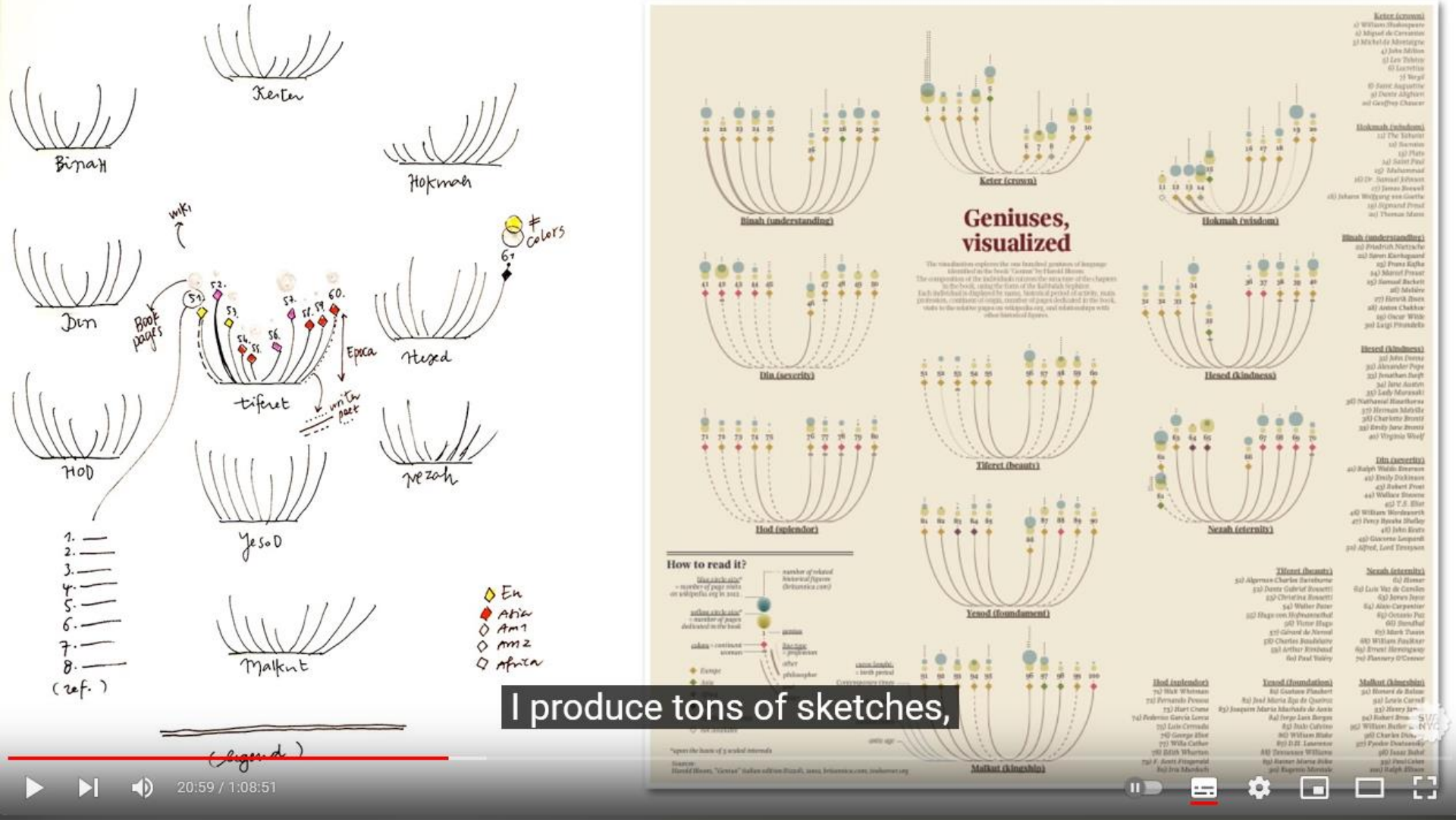
informatics mathematics
Inria

IDEATION

How do we come up with a new (visual analytics) system / tool ?

IDEATION =

the formation of ideas or concepts



https://youtu.be/OaYU-gStjUs?feature=shared&t=1196

SKETCHING

As an important part in ideation

SKETCHES ARE…

- quick, freehand drawings
- can include labels or captions
- don't need to be pretty

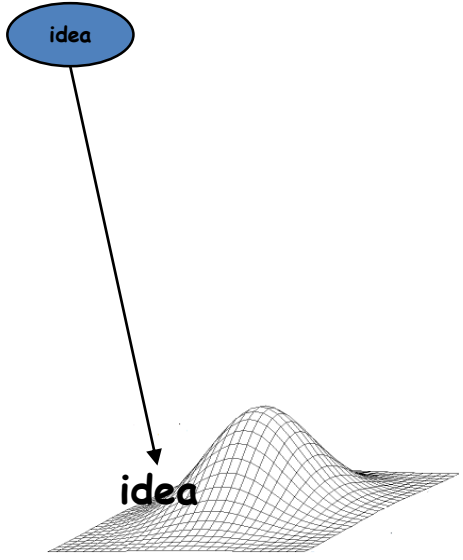
- goal:
  - for communication
  - for brainstorming

try to communicate ideas with as few lines (as little "ink") as possible!

WHY SKETCH

getting the design right

- generate an idea

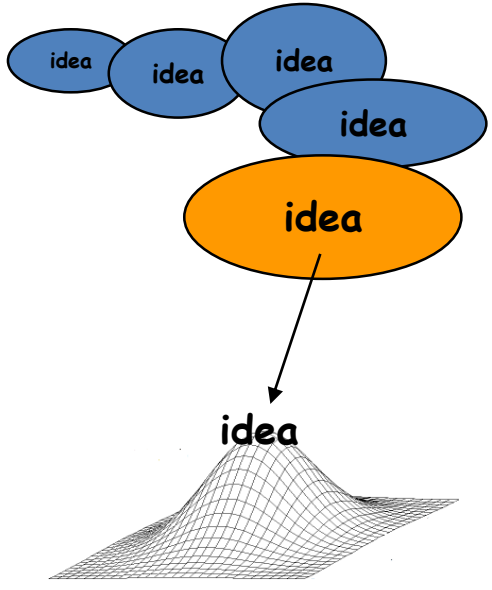


Graphs on the next few slides were modified from images found in the Sept. 2009 Wikipedia entry: *hill climbing*

WHY SKETCH?

getting the design right

- generate an idea
- iterate and develop it

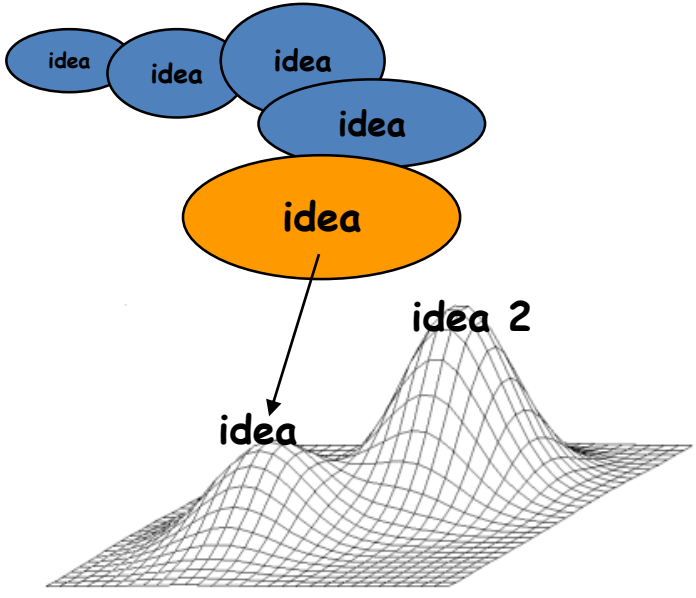


but is it the best idea?

WHY SKETCH?

getting the design right

- generate an idea
- iterate and develop it



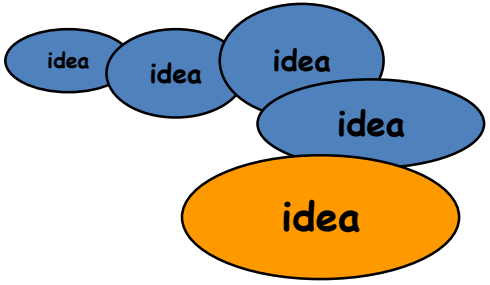
The problem

- other better solutions may be available in different ideas
- local *vs.* global maxima (local hill climbing)
- often results from fixating on a single idea

WHY SKETCHES?

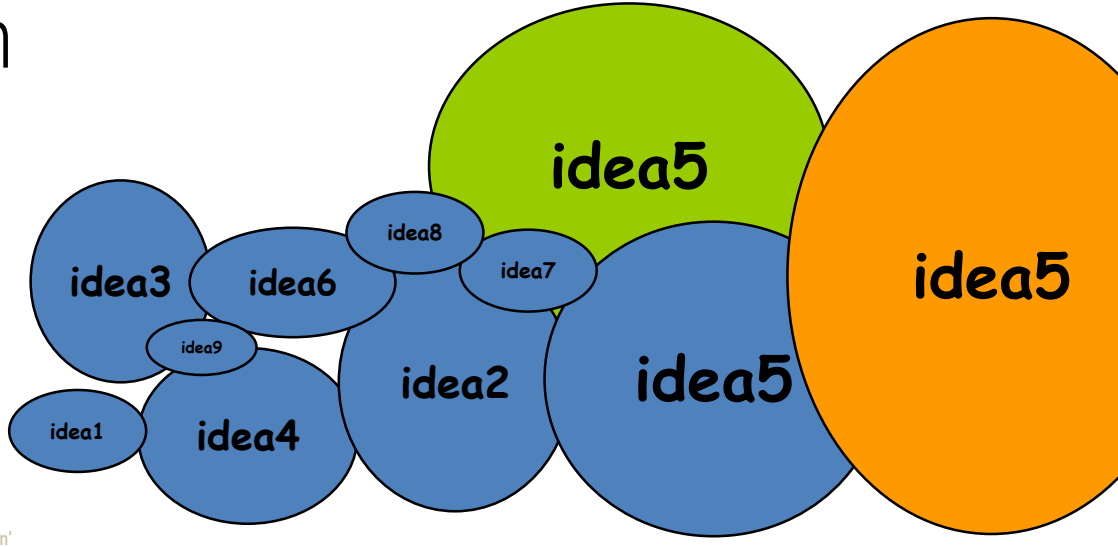
getting the design right

- generate an idea
- iterate and develop it



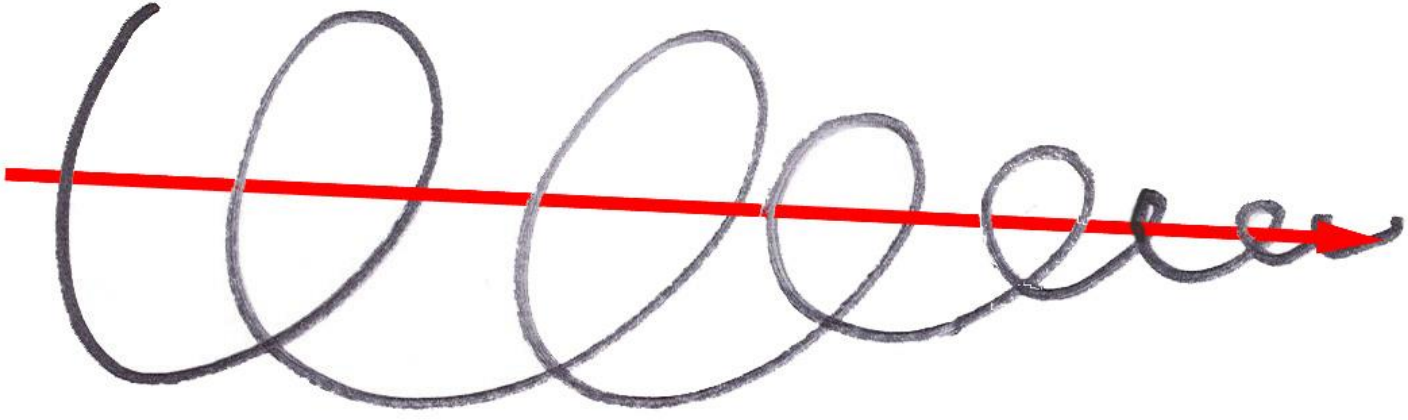
getting the right design

- generate many ideas and variations
- reflect and choose
- *then* iterate and develop your choice

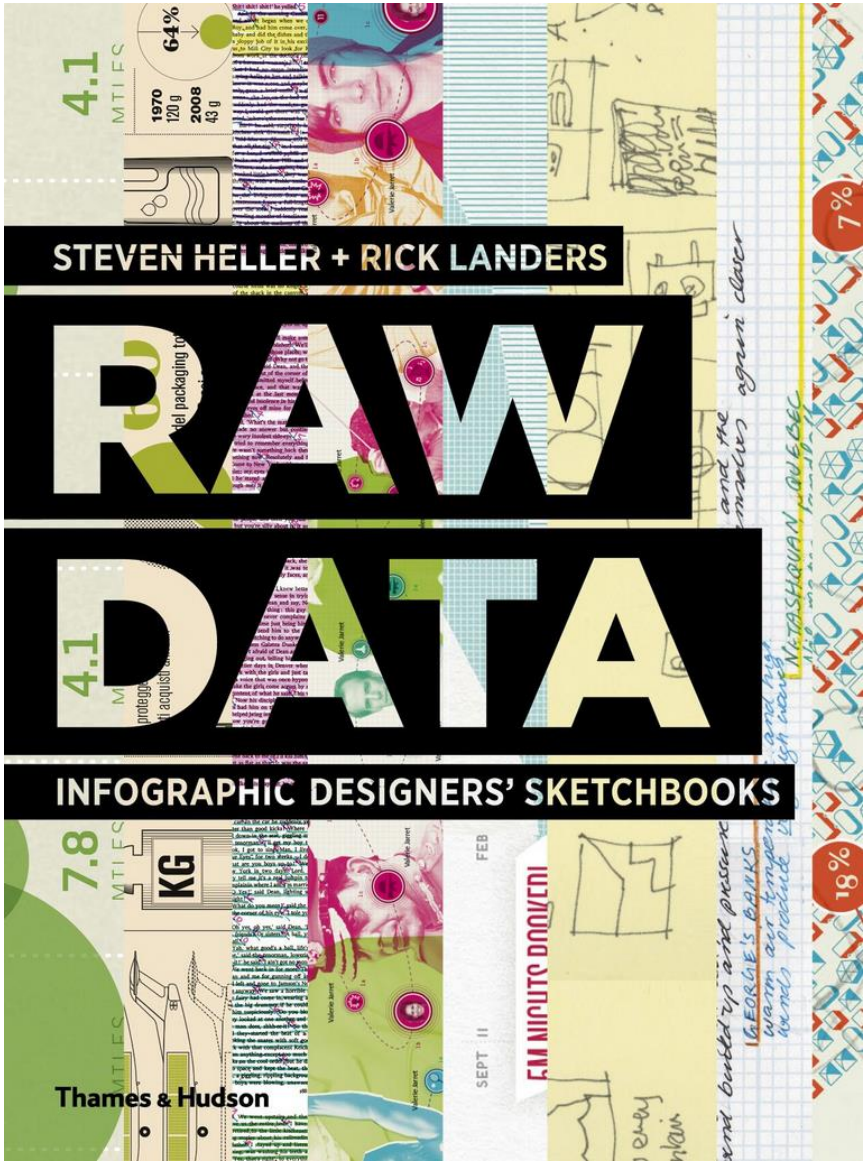


Bill Buxton coined the expression 'Getting the Design Right *vs.* Getting the Right Design'

EXPLORATION OF A SINGLE IDEA



Slide contributed by Bill Buxton


STEVEN HELLER + RICK LANDERS
RAW
DATA
INFOGRAPHIC DESIGNERS' SKETCHBOOKS
Thames & Hudson

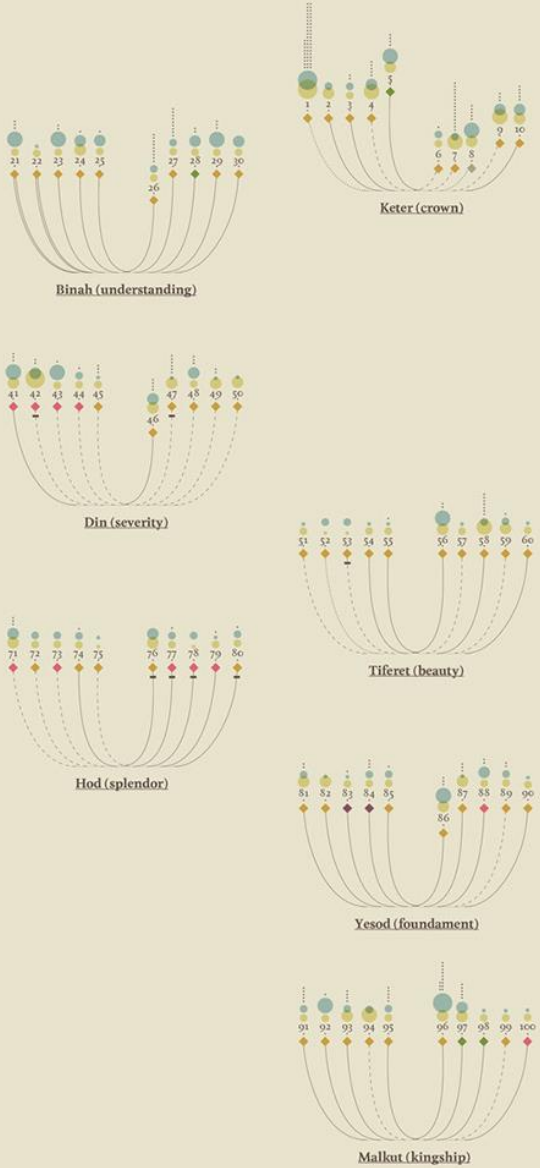
Geniuses, visualized

The visualisation explores the one hundred geniuses of language identified in the book "Genius" by Harold Bloom. The composition of the individuals mirrors the structure of the chapters in the book, using the form of the Kabbalah Sephirot. Each individual is displayed by name, historical period of activity, main profession, continent of origin, number of pages dedicated in the book, visits to the relative pages on wikipedia.org, and relationships with other historical figures.

Harold Bloom, "Genius" italian edition Rizzoli, 2002; britannica.com; toolserver.org

How to read it?

The visualization has been designed and produced by Accurat (www.accurat.it), and was originally published in italian on La Lettura the sunday cultural supplement of Corriere della Sera.



Keter (crown)
1) William Shakespeare
2) Miguel de Cervantes
3) Michel de Montaigne
4) John Milton
5) Leo Tolstoy
6) Lucretius
7) Vergil
8) Saint Augustine
9) Dante Alighieri
10) Geoffrey Chaucer

Hokmah (wisdom)
11) The Yahwist
12) Socrates
13) Plato
14) Saint Paul
15) Muhammad
16) Dr. Samuel Johnson
17) James Boswell
18) Johann Wolfgang von Goethe
19) Sigmund Freud
20) Thomas Mann

Binah (understanding)
21) Friedrich Nietzsche
22) Søren Kierkegaard
23) Franz Kafka
24) Marcel Proust
25) Samuel Beckett
26) Molière
27) Henrik Ibsen
28) Anton Chekhov
29) Oscar Wilde
30) Luigi Pirandello

Hesed (kindness)
31) John Donne
32) Alexander Pope
33) Jonathan Swift
34) Jane Austen
35) Lady Murasaki
36) Nathaniel Hawthorne
37) Herman Melville
38) Charlotte Brontë
39) Emily Jane Brontë
40) Virginia Woolf

Din (severity)
41) Ralph Waldo Emerson
42) Emily Dickinson
43) Robert Frost
44) Wallace Stevens
45) T.S. Eliot
46) William Wordsworth
47) Percy Bysshe Shelley
48) John Keats
49) Giacomo Leopardi
50) Alfred, Lord Tennyson

Nezah (eternity)
61) Homer
62) Luís Vaz de Camões
63) James Joyce
64) Alejo Carpentier
65) Octavio Paz
66) Stendhal
67) Mark Twain
68) William Faulkner
69) Ernest Hemingway
70) Flannery O'Connor

Yesod (foundation)
81) Gustave Flaubert
82) José Maria Eça de Queiroz
83) Joaquim Maria Machado de Assis
84) Jorge Luis Borges
85) Italo Calvino
86) William Blake
87) D.H. Lawrence
88) Tennessee Williams
89) Rainer Maria Rilke
90) Eugenio Montale

Hod (splendor)
71) Walt Whitman
72) Fernando Pessoa
73) Hart Crane
74) Federico García Lorca
75) Luis Cernuda
76) George Eliot
77) Willa Cather
78) Edith Wharton
79) F. Scott Fitzgerald
80) Iris Murdoch

Malkut (kingship)
91) Honoré de Balzac
92) Lewis Carroll
93) Henry James
94) Robert Browning
95) William Butler Yeats
96) Charles Dickens
97) Fyodor Dostoevsky
98) Isaac Babel
99) Paul Celan
100) Ralph Ellison

Tiferet (beauty)
51) Algernon Charles Swinburne
52) Dante Gabriel Rossetti
53) Christina Rossetti
54) Walter Pater
55) Hugo von Hofmannsthal
56) Victor Hugo
57) Gérard de Nerval
58) Charles Baudelaire
59) Arthur Rimbaud
60) Paul Valéry

Accurat | Giorgia Lupi

Exploring the phenomenon of geniuses and the brain drain

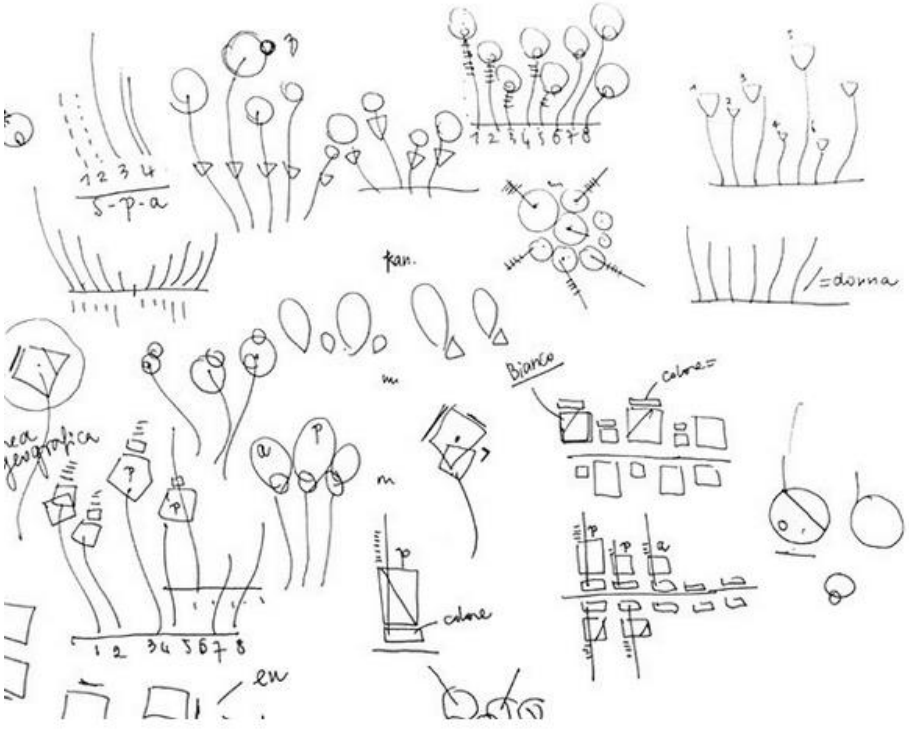
'Drawing plays an important role in the production and communication of knowledge, and in the genesis of new ideas,' says design director Giorgia Lupi, founder of Accurat, an information design agency with offices in Milan and New York. 'In addition, the act of drawing and the fact we choose to stop and draw focuses the attention. When I'm sketching, I always try to find a way to interpret both the single visual elements and the overall composition.'

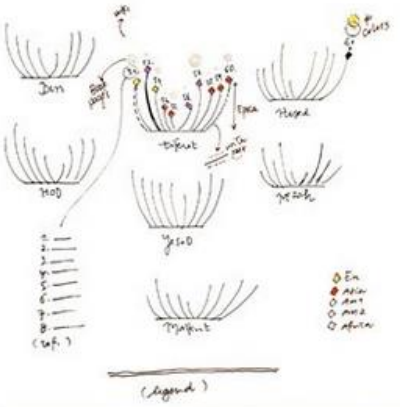
Lupi draws on white paper with Muji black-ink pens. Drawing is her primary expression, a 'functional tool for capturing and exploring thoughts and exploring ideas towards the production of the final piece'. Her team approaches problems in the way that journalists would, rather than as data analysts, understanding in which contexts they must interpret their data.

When describing Geniuses, Visualized, the company's project for *La Lettura*, a magazine supplement in the Italian newspaper *Corriere della Sera*, Lupi says: 'We aim to deliver rich visual narratives, able to maintain the complexity of the data but still making this complexity more accessible and understandable through the visualization.'

They also provide several layers of exploration on the data set being analysed. 'We call it "non-linear storytelling", Lupi says, 'where people can get lost in singular elements, minor tales and "last-mile" textual elements within the greater visualization.'

Lupi and her team regularly push the boundaries on how to 'compose' data-visualizations that achieve aesthetic beauty and elegance through new visual metaphors, intentionally avoiding the more usual and already tested styles of representation.

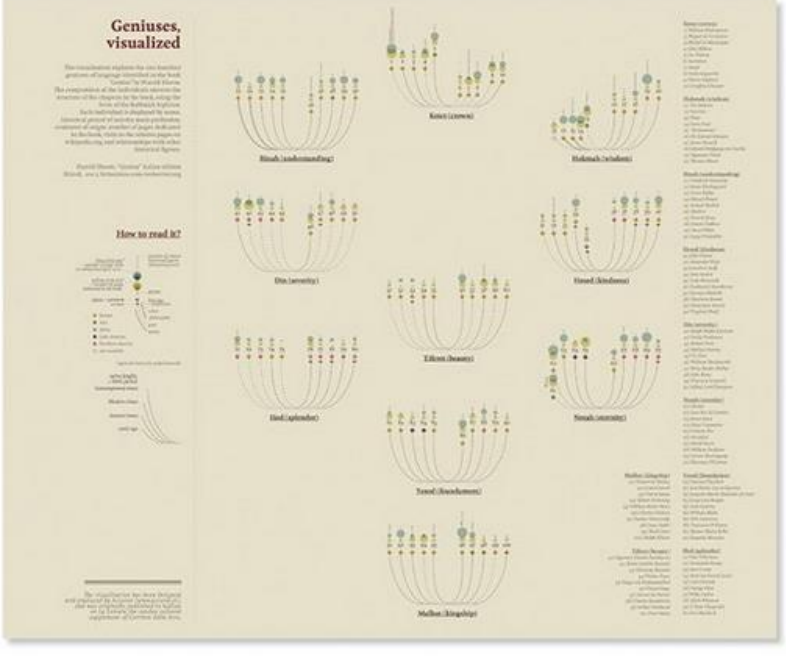


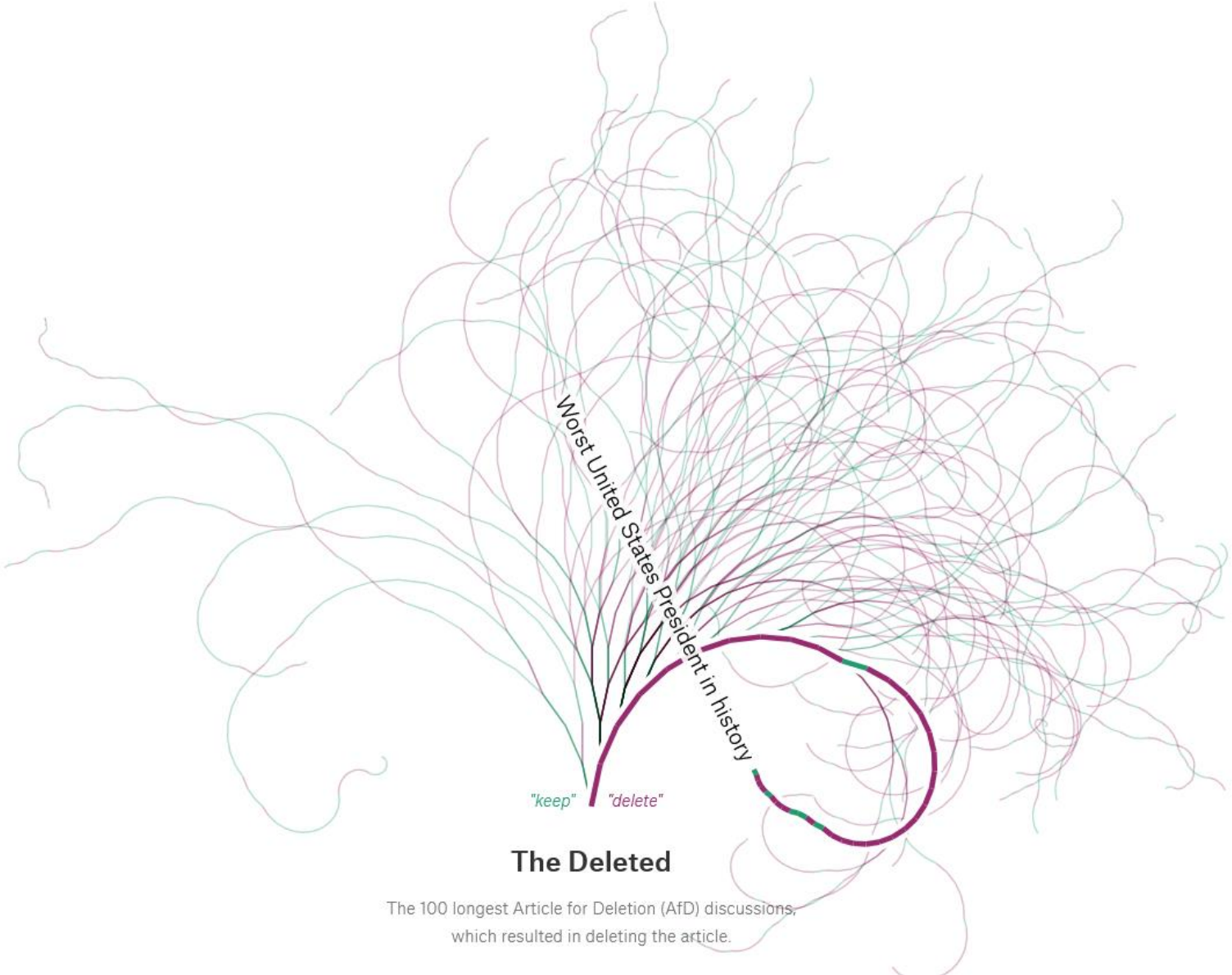


Geniuses, Visualized

***La Lettura*, 2012**

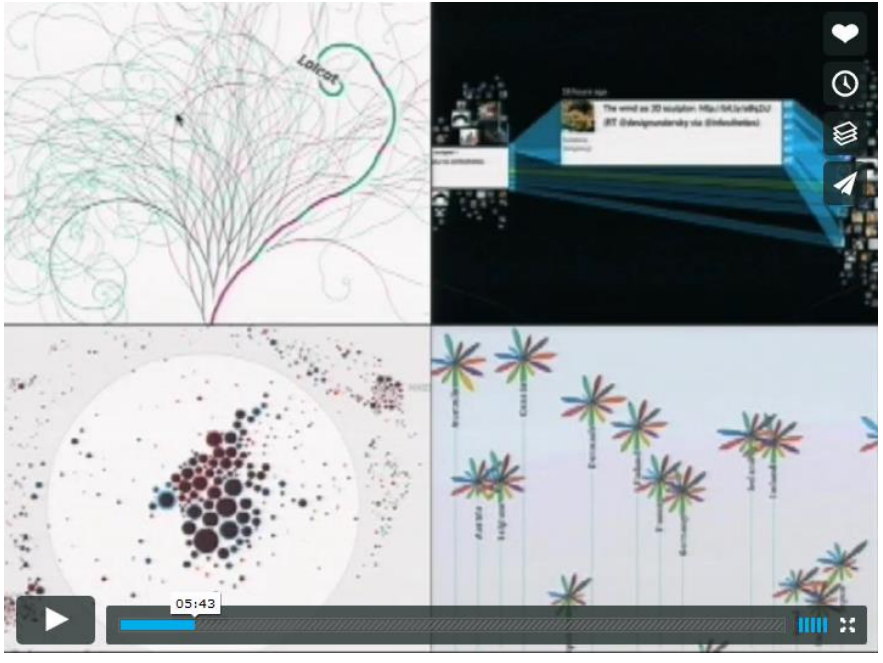
This infographic looked at the 100 'exemplary creative minds' identified in literary critic Harold Bloom's book Genius. Playing off Bloom's use of the Sefirot, the ten emanations of the Kabbalah, to organize the taxonomy of his chosen 'geniuses' of language – from Shakespeare to Lewis Carroll – the visualization depicts the geographic origin, time period and field of each genius, correlated with number of Wikipedia hits and connection to related historical figures.





The Deleted

The 100 longest Article for Deletion (AfD) discussions,
which resulted in deleting the article.



https://vimeo.com/28443920

https://vimeo.com/28443920#t=660s

SKETCHING

Workshop

SKETCHING ACTIVITY (30 MINS)

- sketch a number of different things
- *DO NOT* put your name on your sketches
  - One page per sketch
- we will then put the sketches together on the wall

BUT: “I CAN’T DRAW…”

SOME PRINCIPLES FOR SKETCHING

- use as few lines as you can
- communicate the essence of the idea
- details only if they are important
- choose the detail you put in deliberately
- one piece of paper per sketch!!!!!

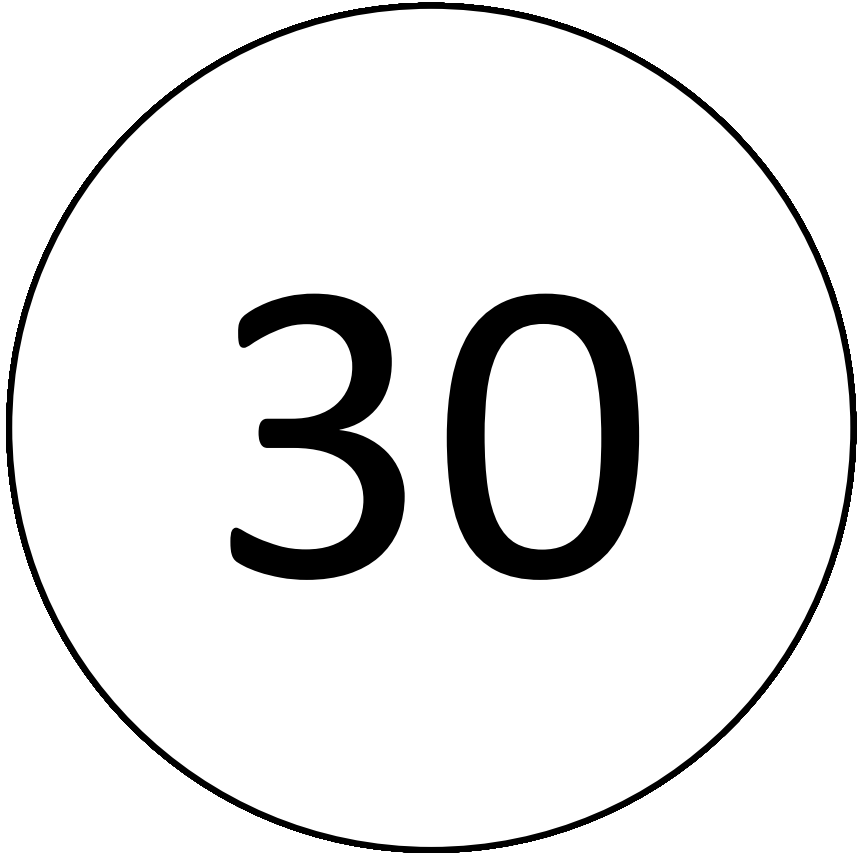
SKETCHING

Principles

- Use as few lines as you can
- Communicate the essence of the idea
- Details only if they are important
- Choose the detail you put in deliberately
- One piece of paper per sketch!!!!!

Exercise

Sketch a cellphone (30s)


30

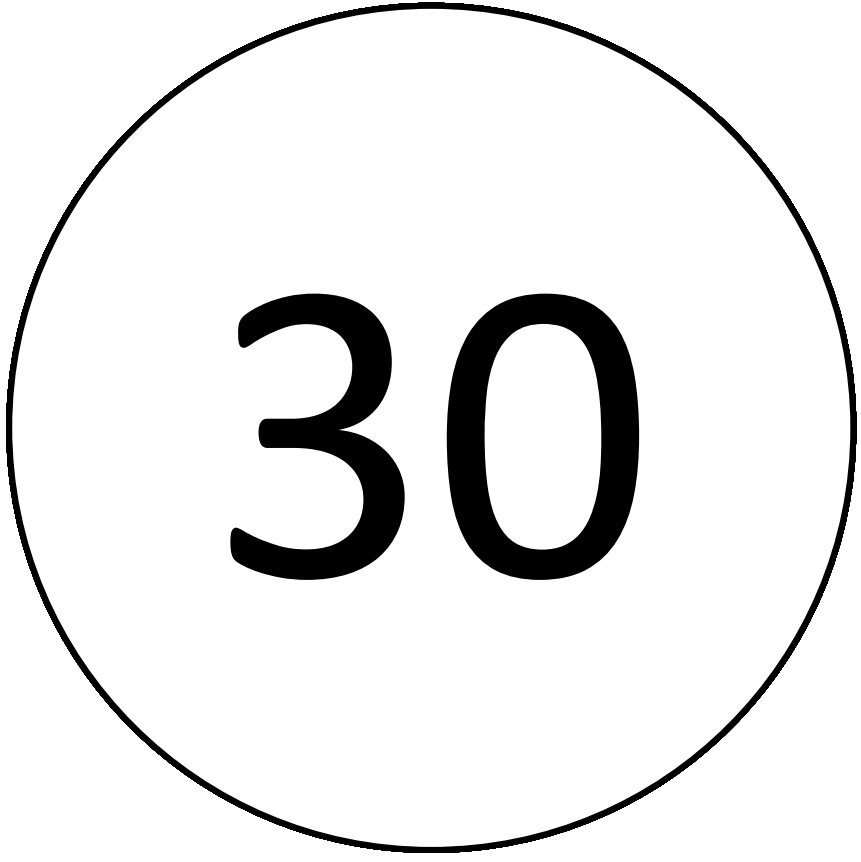
SKETCHING

Principles

- Use as few lines as you can
- Communicate the essence of the idea
- Details only if they are important
- Choose the detail you put in deliberately
- One piece of paper per sketch!!!!!

Exercise

A game (30s)


30

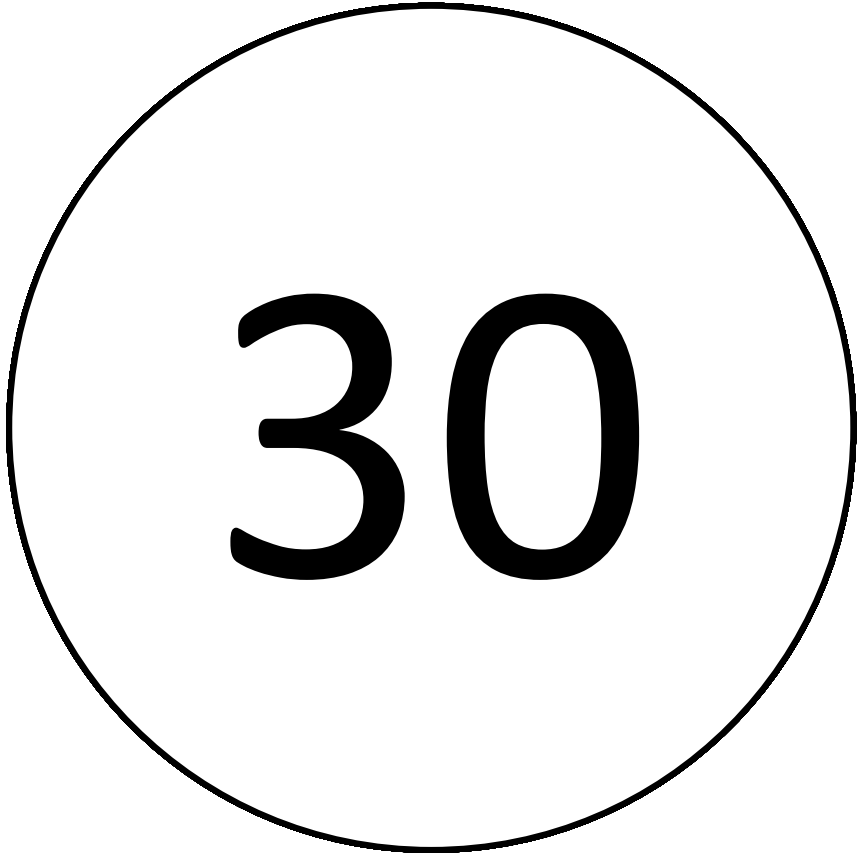
SKETCHING

Principles

- Use as few lines as you can
- Communicate the essence of the idea
- Details only if they are important
- Choose the detail you put in deliberately
- One piece of paper per sketch!!!!!

Exercise

A hand (30s)


30

DISCUSSION (10 MINS)

- post up your sketches
- what worked well?
- what didn't work well?
- what things were important to communicate the idea?
- what wasn't important to communicate the idea?

- Note: DO NOT "defend" your sketch (better yet: don't identify it is yours). Remember that your peers are the "users" of your sketch. If they find something incomprehensible, this is telling you something.

SKETCHING DATA

GET MORE PAPER READY

SKETCH THE RELATIONSHIP BETWEEN TWO NUMBERS

(10 MINUTES)

75 37

(there are at least 45 different ways)

75 and 37

1. writing, number notation

2. squares

3. repeated icon

https://rockcontent.com/blog/45-ways-to-communicate-two-quantities/

GENERAL ADVICE

Get to know your data first

- what attributes are included? How do the attributes relate to each other?
- what are the types of attributes included?
- can I derive new attributes from the existing attributes?
- what questions does the data trigger in you? Write them down

SKETCHING TUTORIAL PART II

YOUR PROJECT

Visualization For Social Good

YOUR NEXT ASSIGNMENT

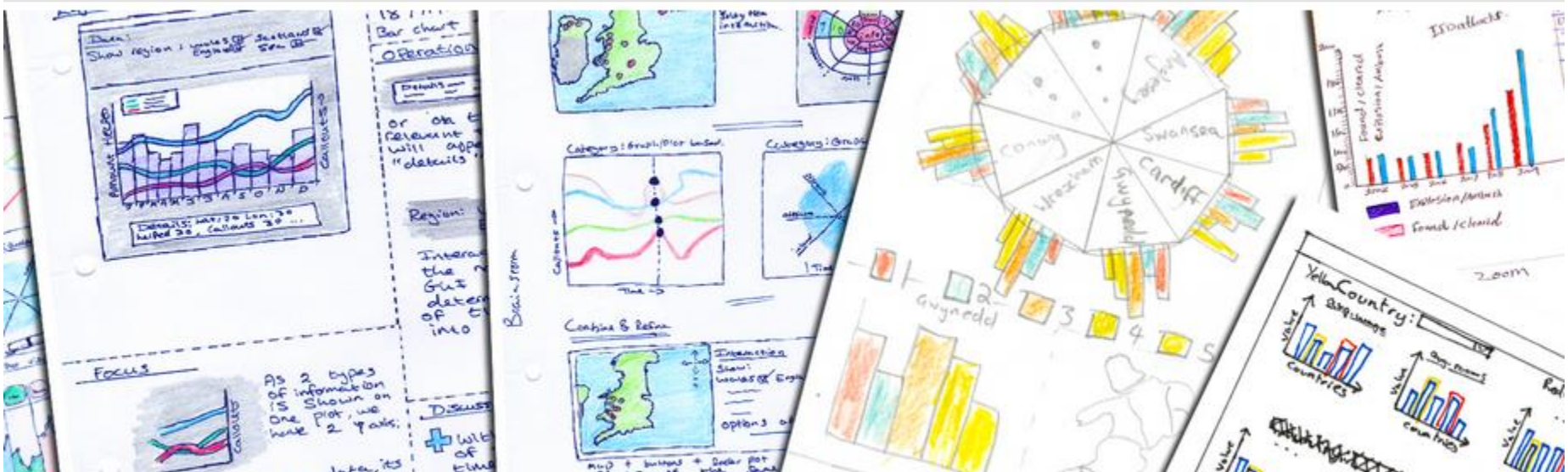
brainstorming session (spend 1h together)

submit one sketched idea per person

5 DESIGN SHEETS

An alternative methodology for sketching visualizations

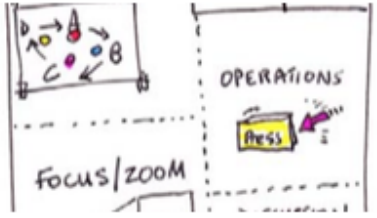
Roberts, Jonathan C., Chris Headleand, and Panagiotis D. Ritsos. "Sketching designs using the Five Design-Sheet methodology." IEEE Transactions on visualization and computer graphics 22.1 (2016): 419-428.



Sheet 1 : Brain storm

The idea of brain-storming is to enlarge the design space of possibilities. There should be a focus on quantity – to generate all the possible designs.

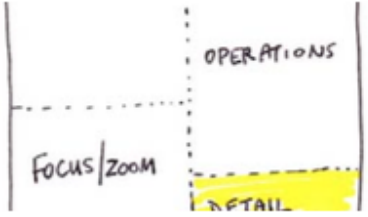
Read More »



Sheet 2/3/4: initial designs

The individual design sheets are used to record three ideas from the brain-storming exercise in greater detail. These sheets should represent three completely different designs.

Read More »



Sheet 5: Realization design

This is the realization design. This is what you think the visualization tool may look like, what specific visualization technique it principally uses and how users operate it.

Read More »

10 PLUS 10 TECHNIQUE

- the 10 plus 10 technique is a great way to generate ideas, PLUS refine those ideas
- this is a technique that you can use in generating ideas/refining them for the purpose of your project

10 PLUS 10 TECHNIQUE

- Generate 10 sketches individually that relate to the design problem (individually) (10 mins)
  - These sketches must be meaningfully different (i.e. avoid variations on the same idea)
  - Take risks: do not limit yourself to the realities of "today"
  - Avoid judging the quality of these ideas now; the point is to get diversity
- Discuss within your group each of the design ideas represented in the sketches, then select the most promising 3 design ideas (10 mins)
- Using these promising design ideas, generate each an additional 10 sketches that are variations of these 3 design ideas (20 mins)
- Discuss within your group each of these variations, and select the 2 best variations for each design idea (5 mins)
- Present these best ideas to the class and discuss (5 mins for each presentation, plus 5 mins of discussion)

PHASE 1: MAKE 2 SKETCHES (10 MINS)

Generate ~~10~~ 2 sketches individually that relate to the design problem

- These sketches must be meaningfully different (i.e. avoid variations on the same idea)
- ***Take risks: do not limit yourself to the things you know how to implement.***
- Avoid judging the quality of these ideas now; the point is to get diversity

PHASE 2: INTERNAL DISCUSSION (5MINS)

- Discuss within your group each of the design ideas represented in the sketches
- Select the most promising 3 design ideas

PHASE 3: “PLUS 10” (10 MINS)

- Using the 3 promising design ideas, generate an additional 10 sketches that are variations of these 3 design ideas

- On a per-person basis, it might be best to stick to one of the design ideas

This is the original method. In class, we might be out of time by now…
if not take ONE promising idea and try to generate variations

PHASE 4: INTERNAL DISCUSSION 5MINS

- Discuss within your group each of these variations

- Select the 2 best variations for each design idea

PHASE 5: PRESENT (5 MINS/GROUP)

Present these best ideas to the class and discuss (5 mins for each presentation, plus 5 mins of discussion)

LESSONS FROM 10 PLUS 10

- 10+10 is a great technique for brainstorming
- This is a great way to “unstick” yourself if you feel stuck on a design problem.
- Note: there are phases where you discuss with others—in principle, you can do this on your own.
- But, one thing to remember is that it is always valuable to discuss the sketches with others—forces you to communicate something, and forces you to be concrete.

ACKNOWLEDGEMENTS

Slides in were inspired and adapted from slides by

- Nicolai Marquardt (University College London)
- Uta Hinrichs (University of St. Andrews)
- Saul Greenberg (University of Calgary)
- Tony Tang (University of Calgary)
- Visualization for the Future Workshop at IEEE VIS 2020