

Lecture 2: Visual representation

Overview of the course

- Theory driven approaches to HCI
- **Design of visual displays**
- Goal-oriented interaction
- Designing smart systems
- Designing efficient systems
- Designing meaningful systems (guest lecturer)
- Evaluating interactive system designs
- Designing complex systems

Why talk about visual design?

Visual design questions are often where discussions about HCI start

“What colour should this be?”

“Should it be 5 pixels or 7?”

“Will this work for colour blind people?”

These conversations are a lot more complicated than they seem...

The range of visual representations

(See: “Visual representation” in “The Encyclopedia of Human Computer Interaction, 2nd Ed for a detailed narrative)

TYPOGRAPHY AND TEXT

The Grid System - Mozilla Firefox
 File Edit View History Bookmarks Tools Help
 http://www.thegridsystem.org/ typographic grid

egyptian statue, egyptian god, egyp... x The Grid System

The Grid System

The ultimate resource in grid systems.

"The grid system is an aid, not a guarantee. It permits a number of possible uses and each designer can look for a solution appropriate to his personal style. But one must learn how to use the grid; it is an art that requires practice."
 Josef Müller-Brockmann

Show Grid
 Join The Forum

Search

Articles

30 Grid-Based WordPress Themes
 In this article we have 30 WordPress themes have been developed using a popular CSS Grid Frameworks such as the 960.gs, Blueprint, YUI2 and The Golden Grid.
 23.Aug.2010

Design & Build a Grid Based Web Design with CSS
 Step by step walkthrough of the design and build process of a grid based WordPress theme. From the initial Photoshop concept, through development.
 23.Aug.2010

Long Live the 12-Column Grid
 When I first crossed the great divide from print to web, one of the earliest things I tried to do was introduce a flexible multi-column grid (you know, like a magazine).
 07.May.2010

[View All Articles >](#)

Tools

960 Grid System Photoshop Action
 These actions will create a Photoshop document ideal for laying websites out in 12, 10, 8, 6 and 4 columns.
 23.Aug.2010

iPhone Grid System
 A 12:8 (480:320) modular grid system for the iPhone, with the unit of 40px and the gutter of 5px.
 23.Aug.2010

Fluid Grid
 A web grid system that allows designers to use the screen real estate on large monitors and retain great design on smaller ones.
 07.May.2010

[View All Tools >](#)

Books

Universal Principles of Design
 Universal Principles of Design is the first comprehensive, cross-disciplinary encyclopedia of design.
 04.Nov.2009

Designing for the Web
 A Practical Guide to Designing for the Web has written explanations of the core principles of graphic design in relation to the web.
 08.Oct.2009

The Way of Typography
 The book also goes into depth on how to create grid systems by hand with only pencil, straightedge and compass.
 18.Sep.2009

[View All Books >](#)

Templates

The Golden Grid Template
 A PSD template based on the CSS framework The Golden Grid by Vladimir Carrer.
 02.Mar.2010

Photoshop 4 Column Grid
 A free 4 Column Photoshop grid template for a 1024x768 screen resolution by Ray Gulick.
 08.Jun.2009

InDesign 568x792 Grid System (12)
 By Dario Galvagno. Adobe InDesign file with a grid system for a 568pts x 792pts page that is divided into 12 columns and rows using the Golden Ratio. Includes a 12pt baseline grid.
 16.Apr.2009

[View All Templates >](#)

Blog

Forum is back up!
 Sorry for the downtime on the forums. They're back up now.
 07.May.2010

Sushi & Robots
 Beautifully personal portfolio by Jina Bolton that reveals the site grid and baseline grid.
 07.May.2010

Bisgrafic
 Lovely grid site design by Barcelona based Bisgrafic.
 07.May.2010

[View All Blog Posts >](#)

Inspiration

- Ace Jet 170
- AisleOne
- Athletics
- BBDK
- Blanka
- Build
- Corporate Risk Watch
- Counter Print
- David Airey
- Design Assembly
- Dirty Mouse
- Experimental Jetset
- Form Fifty Five
- Grafik Magazine
- Grain Edit
- Graphic Hug
- I Love Typography
- Lamosca
- Mark Boulton
- Minimal Sites
- Monocle
- Neubau
- NewWork
- OK-RM
- Original Linkage
- Robin Uleman
- SampsonMay
- Schmid Today
- September Industry
- Soulellis
- Subtraction
- Swiss Legacy
- The International Office
- Thinking for a Living
- This Studio
- Toko
- Typographic Posters
- Visuelle
- Xavier Encinas
- Year of the Sheep

Done zotero

Incipit epistola sancti ieronimi ad
paulinum presbiterum de omnibus
diu et hystorie libris capituli primi.

Hanc ambrosius
tua michi munus-
cula precatus dedit
sit et suavissimas
lras q̄ a principio
amicidae. sic p̄b-

et iam h̄dā et veteris amicitie noua:
p̄fectant. Et ita tū illa necessitudo ē
et xpi glorio copulata. q̄m non vali-
tas et familiaritas. nō p̄dā tuncum
corporis. nō s̄dola et palpas adulato-
sed dei amor. et diuina scripturarū
studia conualiant. legim⁹ in veteris
hystorie. quod dā iustitiae. p̄uicia. a.
nouos adisse p̄los. maria etā iuste.
ut eos quos et libris nouerant. corā
q̄ videret. Sicut piragoras mouphi-
nicos viros. sic plato egip̄i. et archimē-
tarcum. cantonq̄. etiam ralis. que
quondā magna grecia dicebat. labo-
riolissime peraguit. et ut qui athenis
m̄p̄ erat. et potius. n̄m̄q̄. dōdinas
achadum. gignasū. p̄louab̄. h̄er
p̄gnus atq̄. discipulus. malēs. aliana
veterē discere. q̄m sua sp̄dum ingat.
Deniq̄. tū lras quasi toto ore fugien-
tes p̄sequit. cap̄. a p̄catis et viciis. a-
tus. orāno. crudelissimo p̄uic. dū.
capimus v̄nd. et seruis. Tamē quia
plius maior. euenit se h̄re. ad orum
lūm. ladeo eloquēcie fonte manantē.
et v̄lūm̄ h̄stanc. galli ar̄q̄. h̄m̄s.
quod am v̄m̄s nobiles legimus. et
quos ad exemplarū sui roma nō
caecat. v̄m̄. h̄ofa fama p̄dure. Ha-
bit illa etas inauditi om̄s seculis.
celebrandūq̄. m̄radm. ut v̄b̄. r̄m̄

ingressi. aliud terra v̄b̄m̄. querant.
Apolloni⁹. h̄re ille mag⁹. ut vulg⁹
loquitur. h̄re p̄fus. ut piragora. ra-
dunt. incaur. plas. p̄cūm̄. caucasi.
albanos. s̄ctas. mallagras. opulē-
tissima indie regna p̄uicant. et ad
geram. lanissimo p̄r̄son. am̄p̄e.
n̄m̄. p̄uic. ad braguanas. ut
braccam. in throno. s̄ctm̄. auro. et de
cantal. fonte p̄oat̄m̄. inter p̄uic⁹
discipulos. de natura. et morib̄. ac de
cū. die. et h̄de. audire. docent.
Iude. p̄. damias. babilonios. chalde-
os. medos. al̄rios. parthos. h̄ros.
pharicos. arabes. palestinos. r̄isus.
ad alleaudriā. p̄erq̄. ad ethiopiā.
ut gignasū. p̄h̄stas. et famosissimam
solis mensam. videret in sabulo. In-
uenit ille vir ubiq̄. q̄. discere. et semp̄
p̄uicēs. semp̄. se. melior. h̄er. Scrip-
sit super hoc planissime octo volumi-
nibus. phisosteano.

Quid loquar de seculi hominibus.
cū ap̄tus paulus. vas decōm̄.
et magister gentiū. qui de consensu
n̄m̄. i. se. hospis loquebat. dicit. An
examinā. queras eius qui in me
loquit̄. xpi. Post damascū. arabi. q̄.
iustitiam. al̄ed̄. iherosolimā. ut v̄d̄.
p̄erū. et m̄s̄. apud tū. dieb̄. quindē.
H̄or. tū. n̄m̄. s̄d. m̄. et ogdo.
ad̄. h̄m̄. gentiū. p̄dicat̄. instru-
tus erat. R̄cl̄. post ānos. q̄m̄.
decem. assumpt̄. barnaba. et or̄. ex-
p̄. h̄re. tū. ap̄tus. cō. ḡ. ut. fore. in. va-
cūm. curat. aut. curat̄. H̄ab̄.
n̄m̄. q̄. l̄. m̄. m̄. v̄m̄. v̄m̄.
ad̄. et. in. auro. disc̄. p̄. de. auctoris.
ore. m̄. h̄. fore. v̄. s̄. Et. de. et.
ethiō. cū. r̄. d̄. et. legat̄.

$$i\hbar \frac{\partial}{\partial t} \Psi = -\frac{\hbar^2}{2m} \nabla^2 \Psi + V \Psi$$

IEEE Software: Behavioural Scier x nook-experimental - Database x +

console.firebase.google.com/u/1/project/nook-experimental/dat... ☆

Apps Offline Gmail AVF sustainability PRs Luke Lark Other Bookmarks

Firestore nook-experimental Go to docs L

Database

Cloud Firestore

Data Rules Indexes Usage

home > conversationTa... > tag-0aa8b45a

nook-experimental	conversationTags	tag-0aa8b45a
+ Start collection	+ Add document	+ Start collection
conversationTags >	tag-0aa8b45a >	+ Add field
messageTags	tag-12be10d3	shortcut: "a"
nook_conversati...	tag-14ea0e13	text: "active case"
sms_raw_msgmap	tag-acc357d0	type: "TagType.normal"
suggestedReplies		
systemMessages		
tables		
translation_cac...		

Cloud Firestore location: eur3 (europe-west)

Develop

- Authentication
- Database
- Storage
- Hosting
- Functions
- ML Kit

Quality

- Crashlytics
- Performance
- Test Lab
- App Distribution

Analytics

- Dashboard
- Events
- Conversions
- Audiences
- Funnels
- User Properties
- Extensions

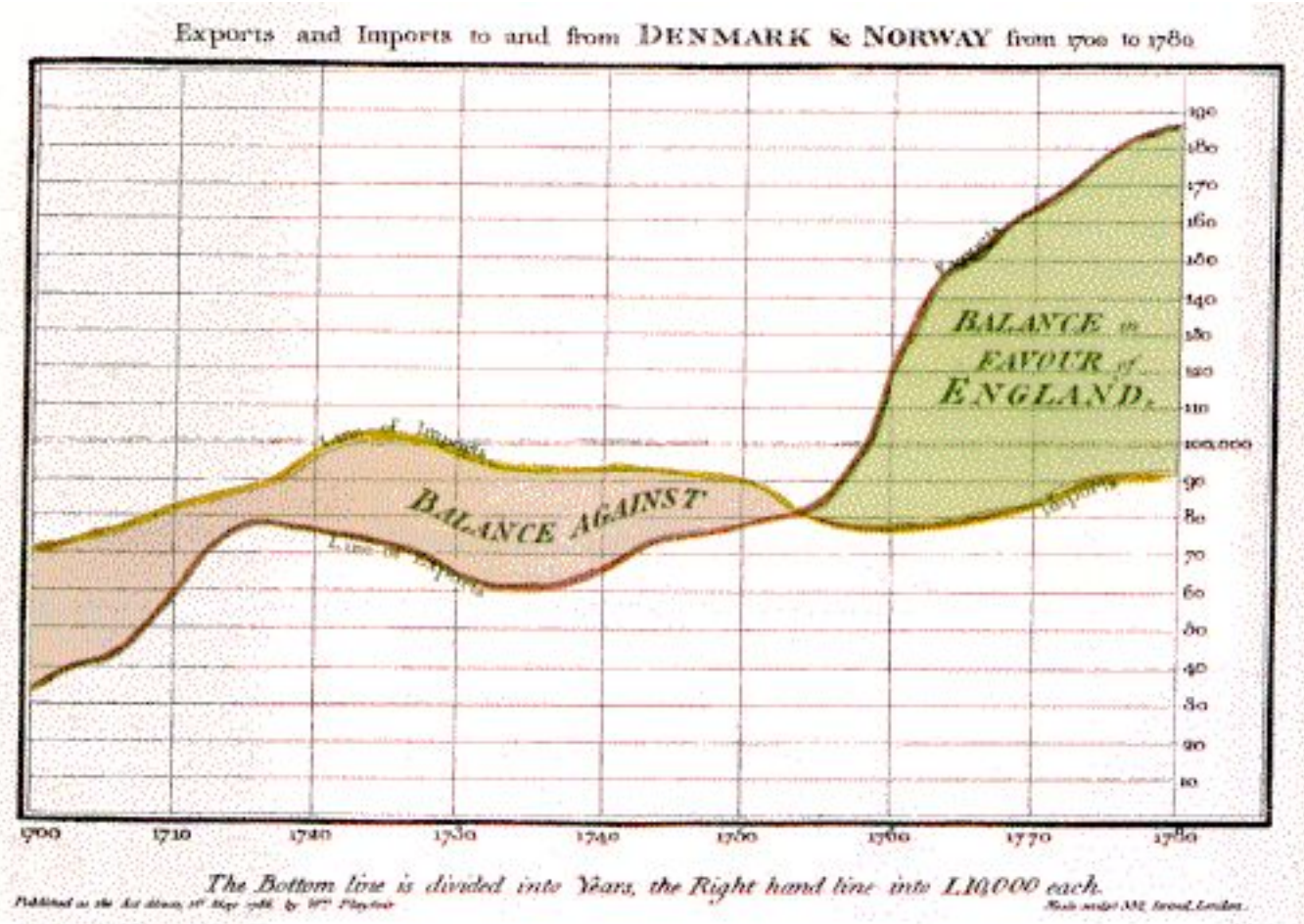
Blaze Modify
Pay as you go

MAPS AND GRAPHS

The EDSAC UI (1950s)



William Playfair (1795)



SAGE air defense (1960s)



Mappa Mundi (1300s)



Bertin's *Semiologie Graphique* (1969)

	Point features	Line features	Area features	Nominal data	Ordinal data	Interval data
POSITION				Effective	Effective	Effective
SIZE				Not Effective	Effective	Effective
VALUE				Not Effective	Effective	Marginally Effective
TEXTURE				Effective	Marginally Effective	Not Effective
HUE				Effective	Marginally Effective	Not Effective
ORIENTATION				Effective	Not Effective	Not Effective
SHAPE				Marginally Effective	Not Effective	Not Effective

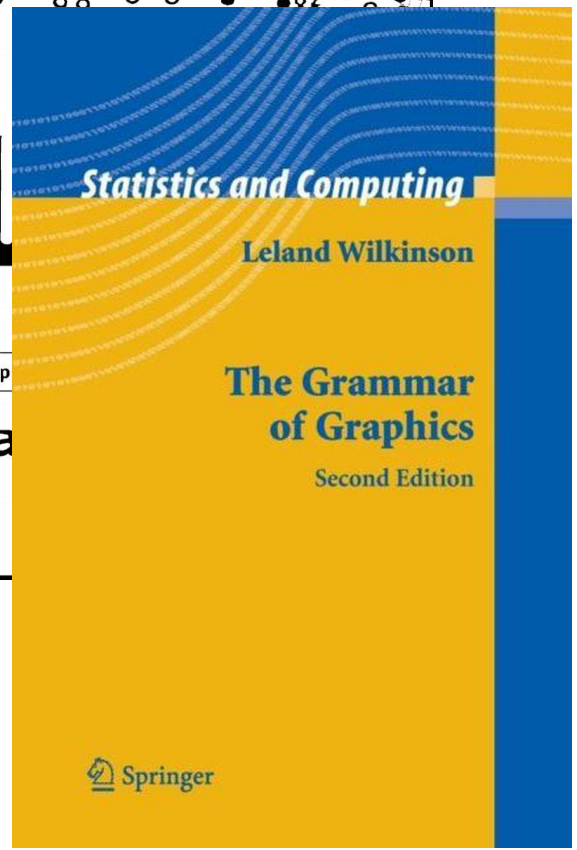
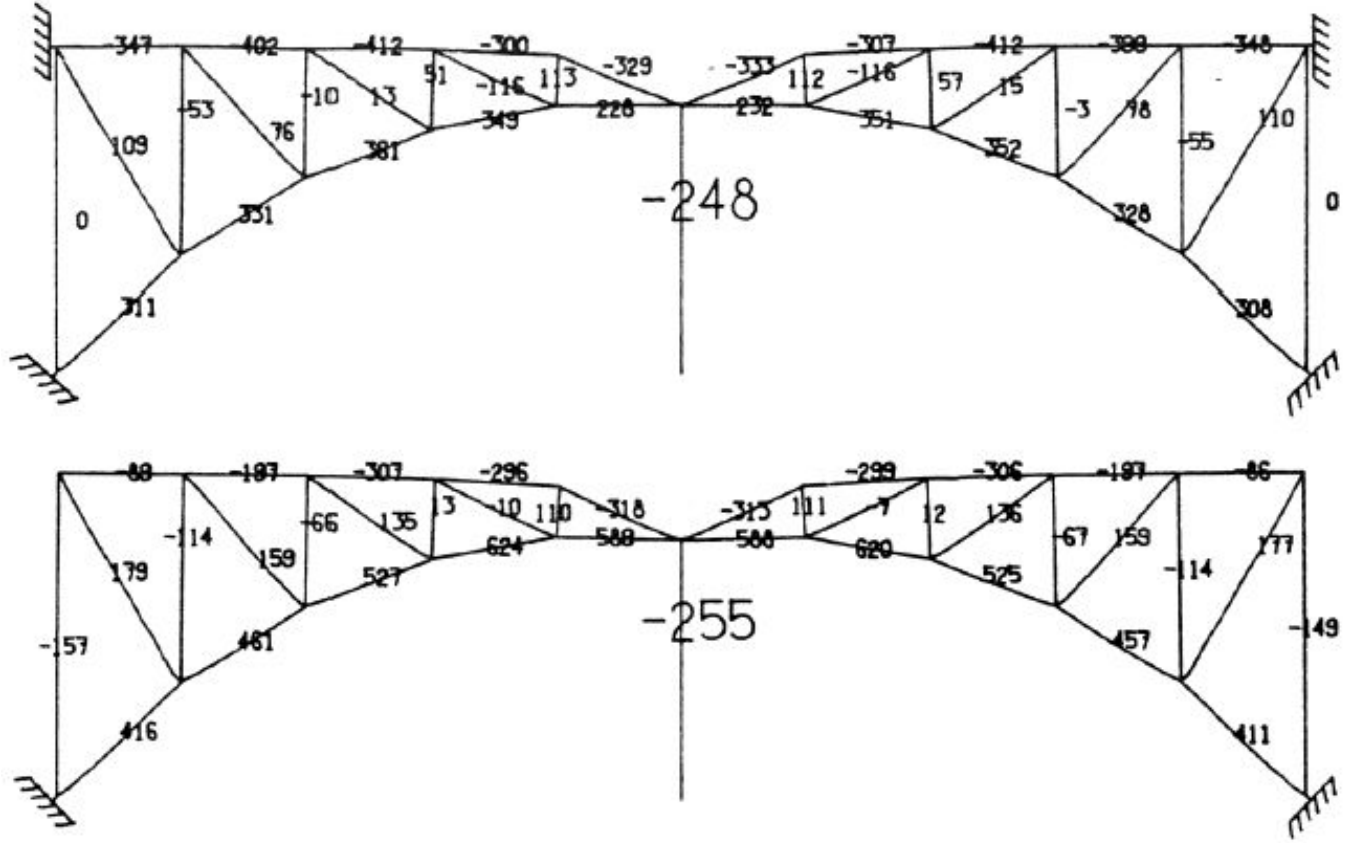


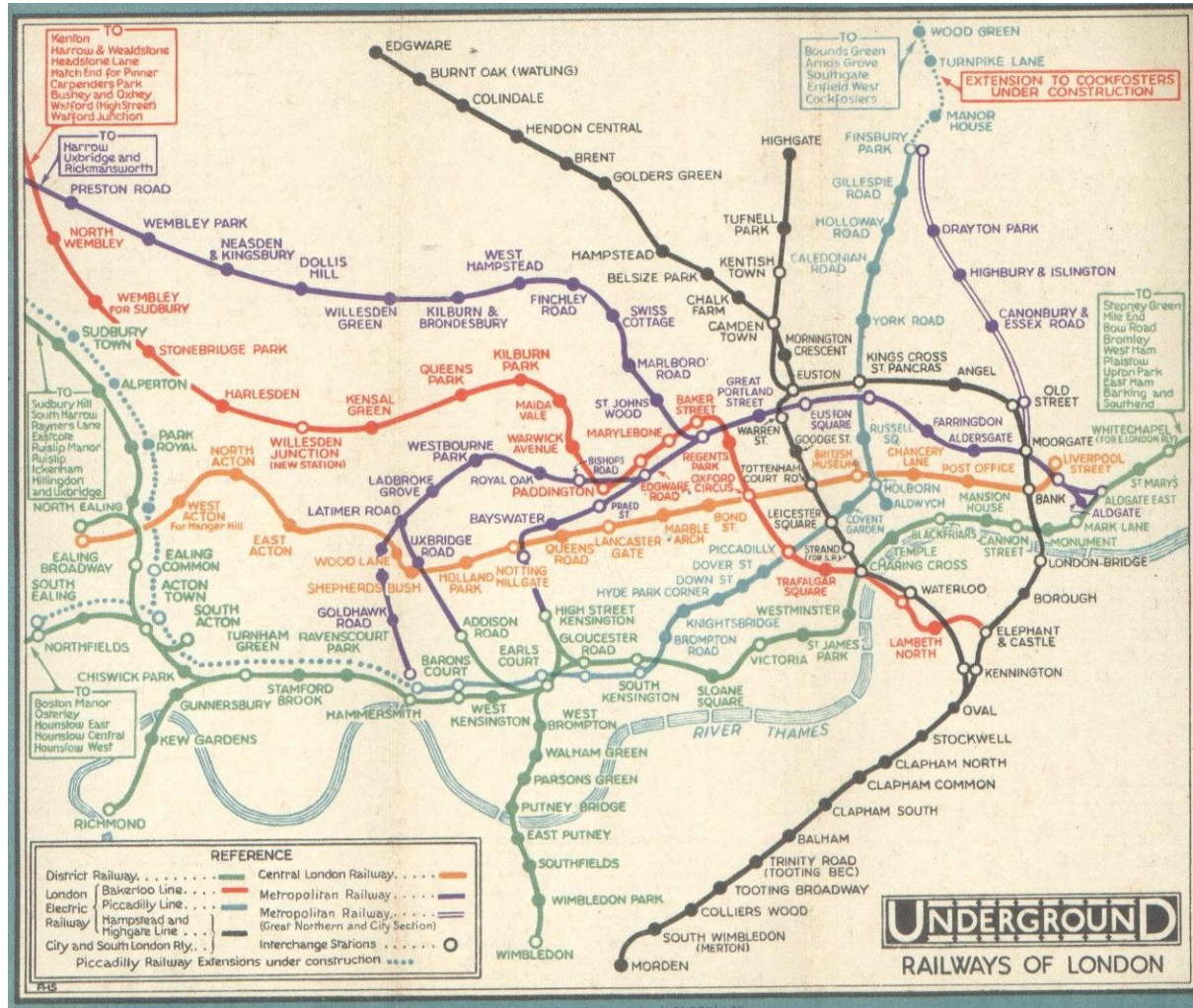
Figure 1. The visual variables and their effectiveness in signifying the three levels of measurement of data (after Bertin [1983]).

SCHEMATIC DRAWINGS

Sutherland's Sketchpad (1963)

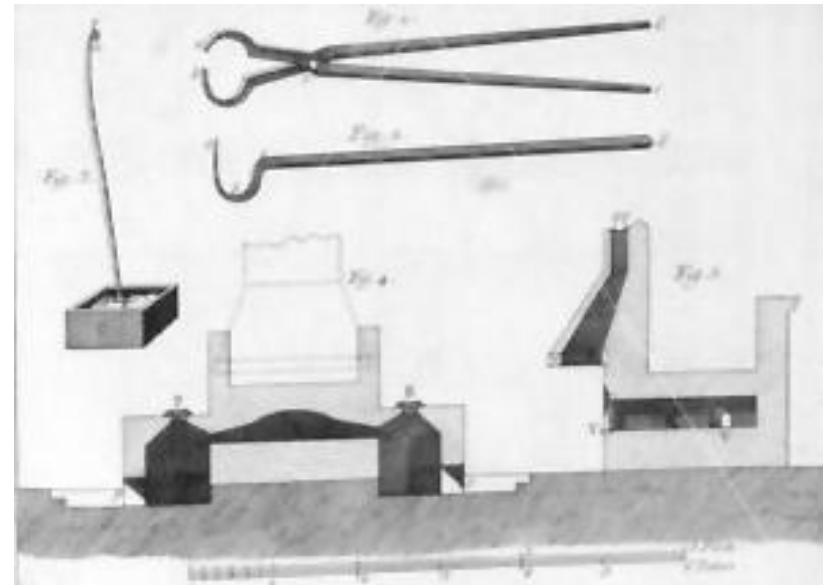
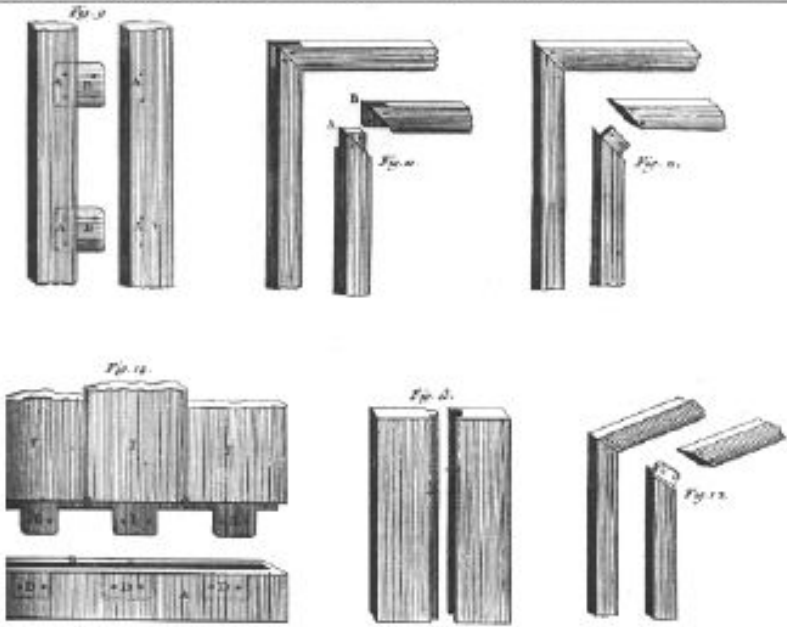
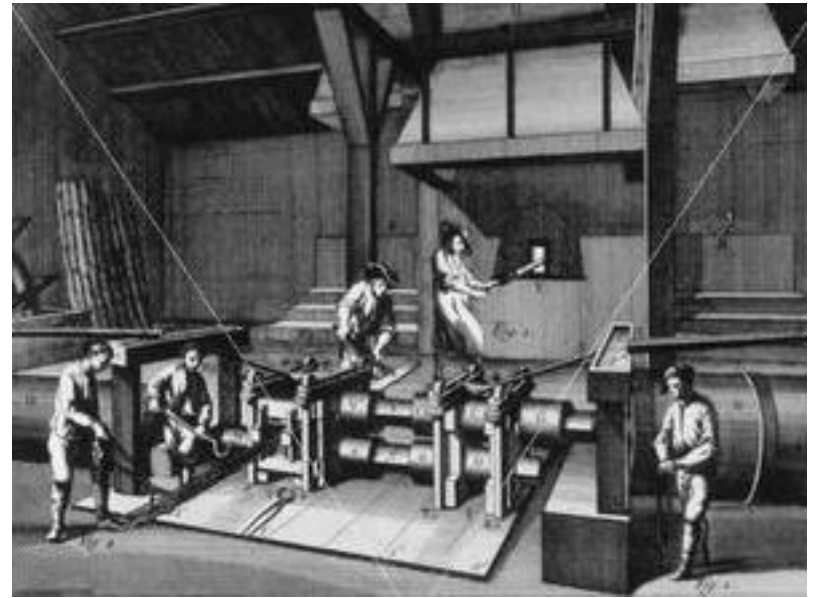
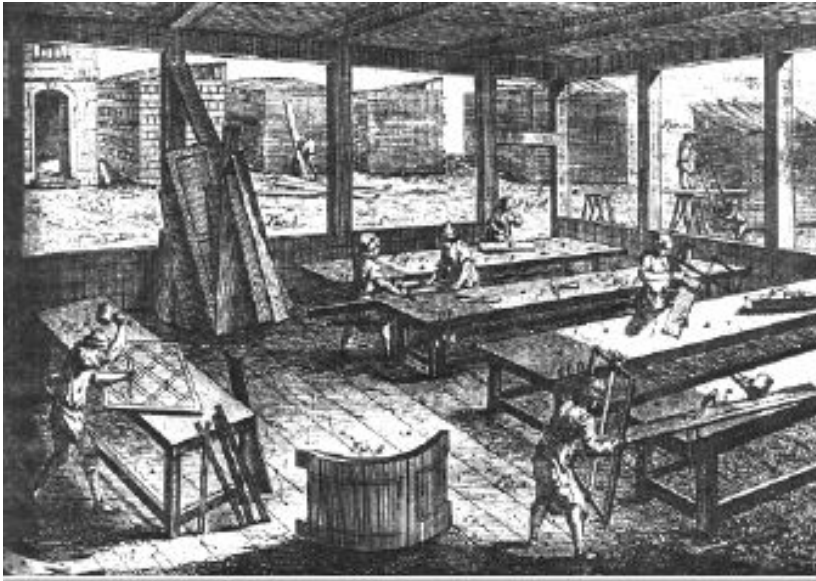


The London Underground Map (1920)

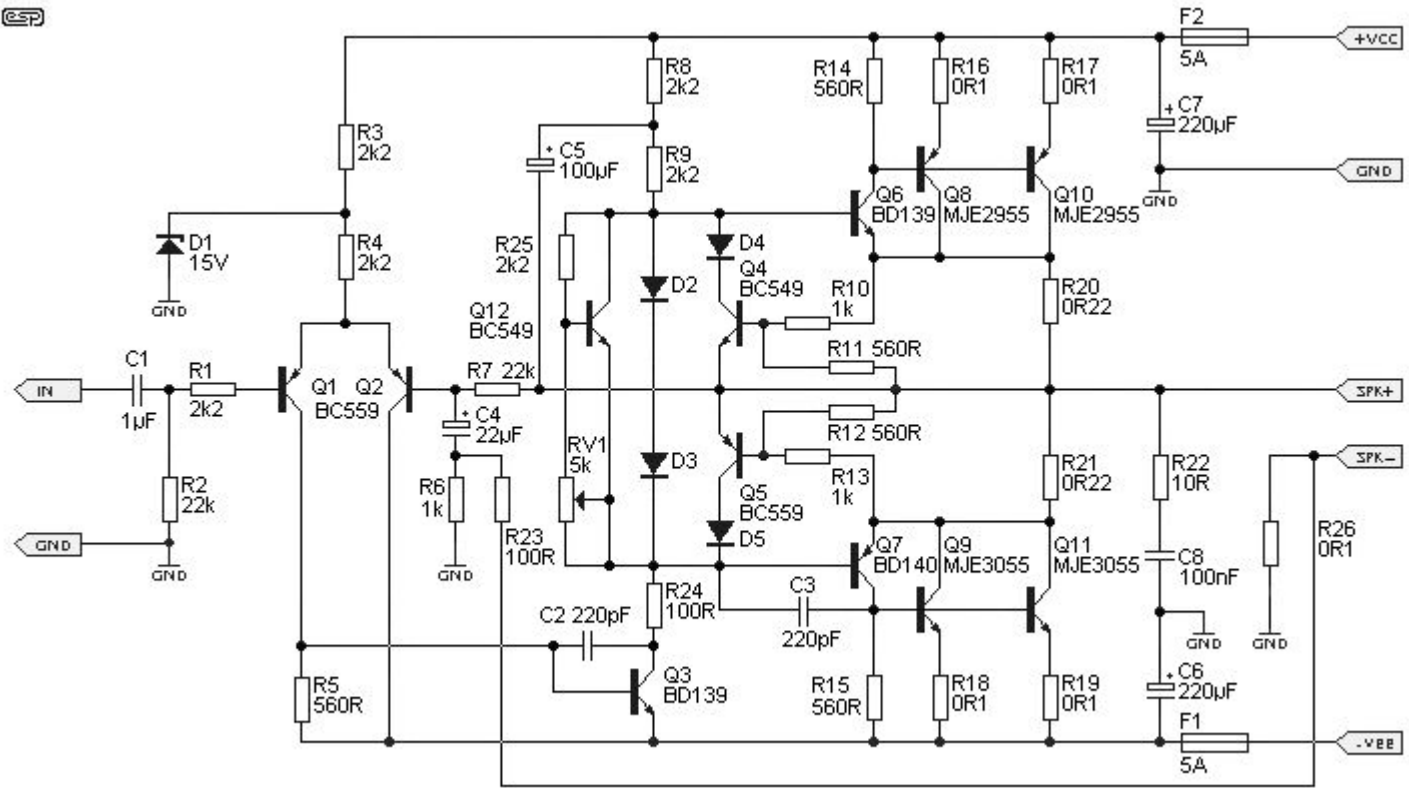


Henry Beck's London Underground Diagram (1931)

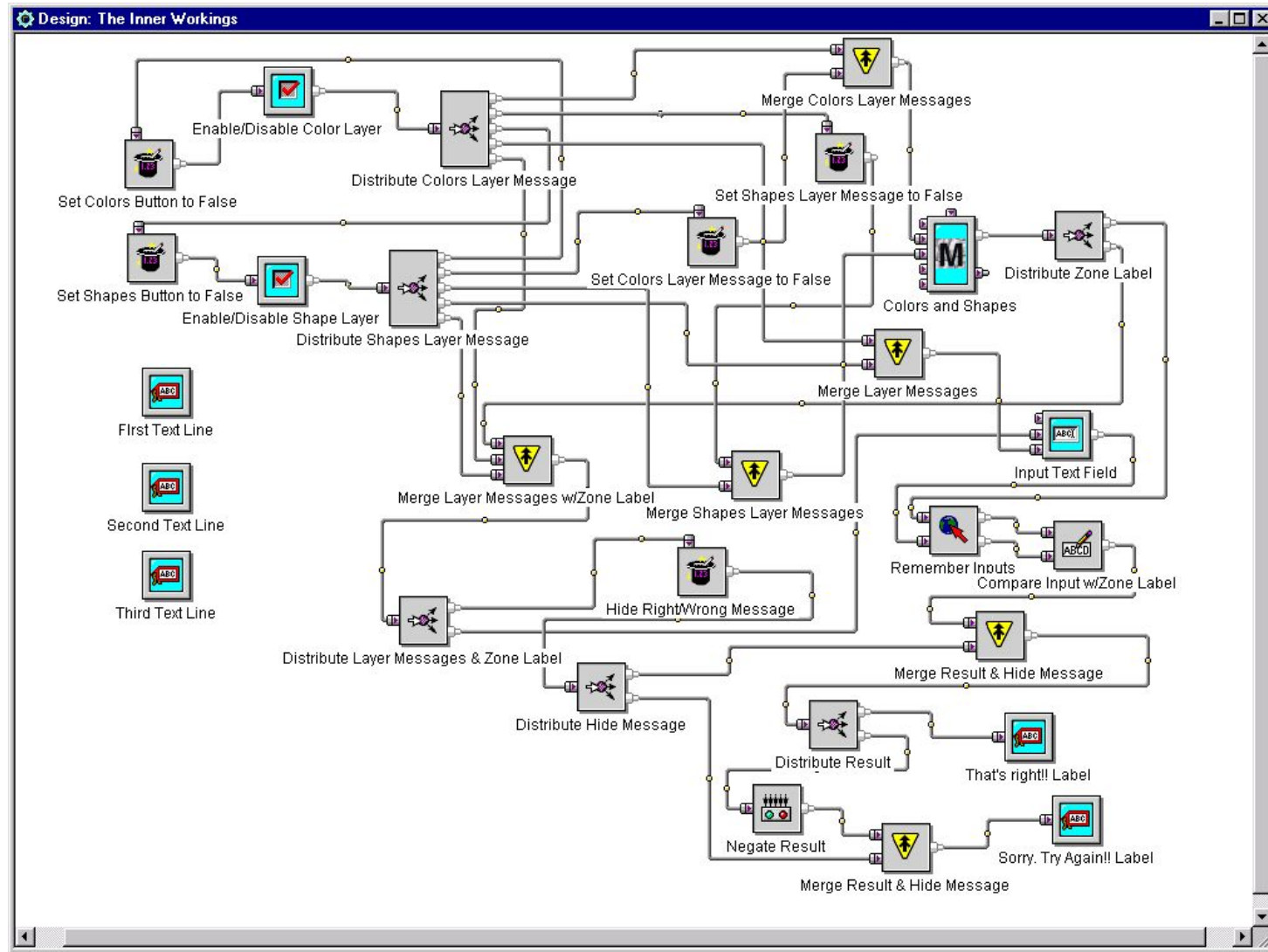




NODE-AND-LINK DIAGRAMS



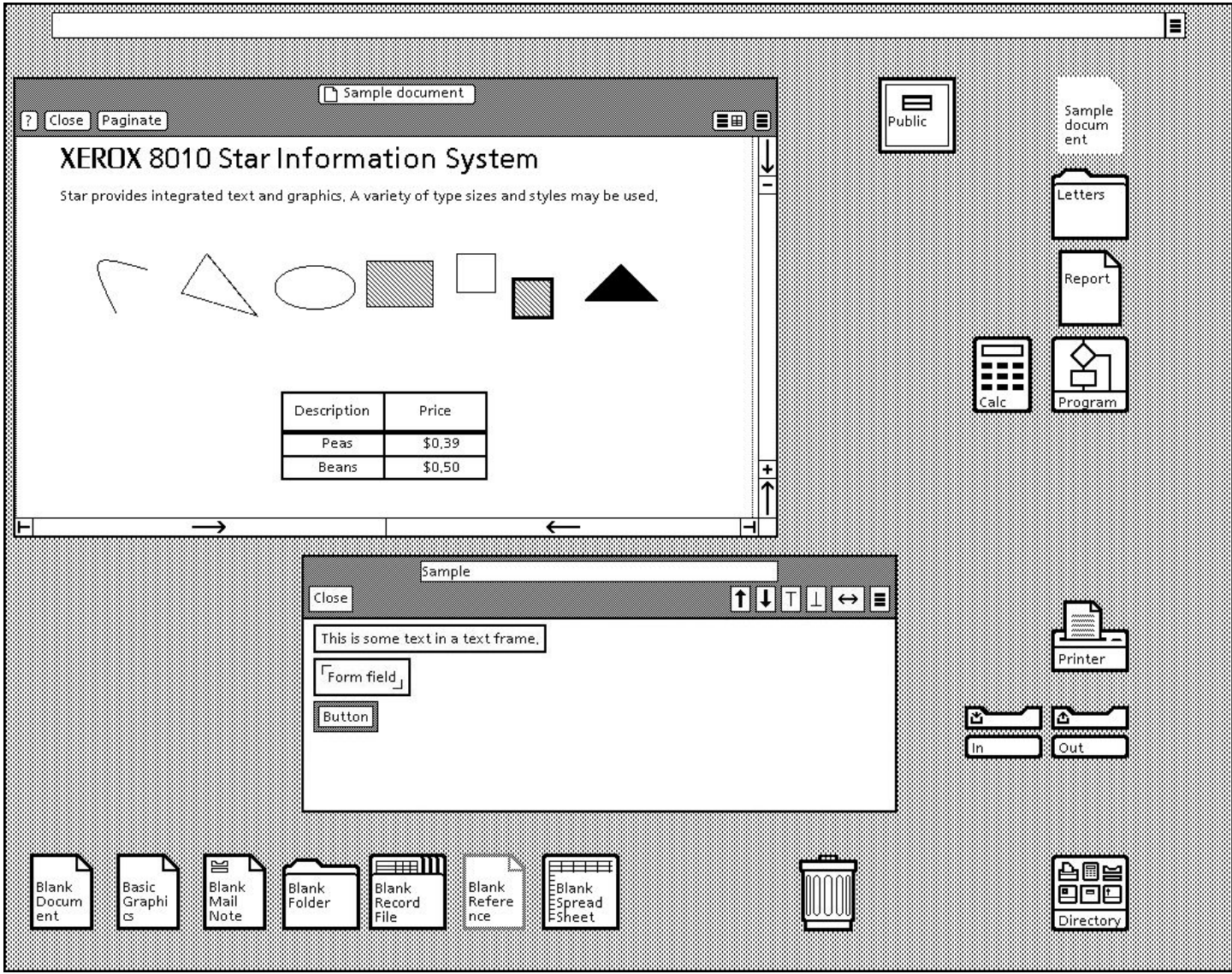
The future of “no-code / low-code”? Java Studio (1995)



ICONS AND SYMBOLS



VISUAL METAPHOR

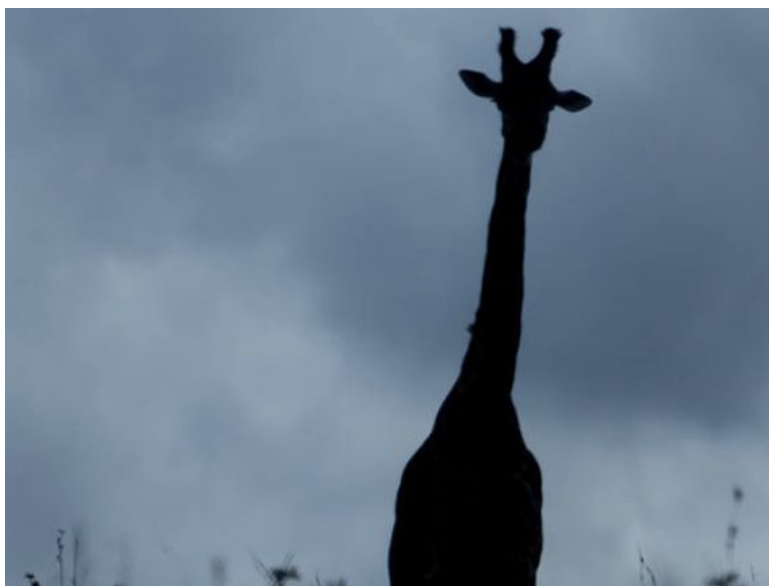




PICTURES







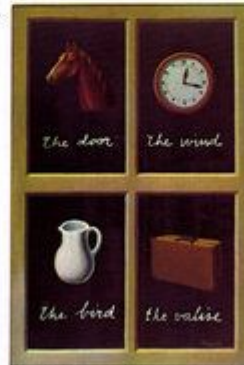


WAYS OF SEEING

JOHN BERGER

Seeing comes before words. The child looks and recognizes before it can speak.

But there is also another sense in which seeing comes before words. It is seeing which establishes our place in the surrounding world; we explain that world with words, but words can never undo the fact that we are surrounded by it. The relation between what we see and what we know is never settled.



The Surrealist painter Magritte commented on this always-present gap between words and seeing in a painting called *The Key of Dreams*.

The way we see things is affected by what we

Theories of visual design

	Graphic Resources	Correspondence	Design Uses
Marks	<ul style="list-style-type: none"> Shape Orientation Size Texture Saturation Colour Line 	<ul style="list-style-type: none"> Literal (visual imitation of physical features) Mapping (quantity, relative scale) Conventional (arbitrary) 	<ul style="list-style-type: none"> Mark position, identify category (shape, texture colour) Indicate direction (orientation, line) Express magnitude (saturation, size, length) Simple symbols and colour codes
Symbols	<ul style="list-style-type: none"> Geometric elements Letter forms Logos and icons Picture elements Connective elements 	<ul style="list-style-type: none"> Topological (linking) Depictive (pictorial conventions) Figurative (metonym, visual puns) Connotative (professional and cultural association) Acquired (specialist literacies) 	<ul style="list-style-type: none"> Texts and symbolic calculi Diagram elements Branding Visual rhetoric Definition of regions
Regions	<ul style="list-style-type: none"> Alignment grids Borders and frames Area fills White space Gestalt integration 	<ul style="list-style-type: none"> Containment Separation Framing (composition, photography) Layering 	<ul style="list-style-type: none"> Identifying shared membership Segregating or nesting multiple surface conventions in panels Accommodating labels, captions or legends
Surfaces	<ul style="list-style-type: none"> The plane Material object on which the marks are imposed (paper, stone) Mounting, orientation and display context Display medium 	<ul style="list-style-type: none"> Literal (map) Euclidean (scale and angle) Metrical (quantitative axes) Juxtaposed or ordered (regions, catalogues) Image-schematic Embodied/situated 	<ul style="list-style-type: none"> Typographic layouts Graphs and charts Relational diagrams Visual interfaces Secondary notations Signs and displays

Use 1: Usability analysis

- Analyse a design using this taxonomy
(e.g. Uses connotative correspondence)
- Determine if the uses are appropriate
(e.g. do people think that blue is 'off' or 'cold'?)

Cases where the visual analysis implies one connection but the operation implies another will create substantial usability problems

Use 1: Usability analysis



Use 1: Usability analysis



Mapping, Categorical: Off, cold, warm, hot

Mapping, Magnitude, Colder -> Warmer

Use 1: Usability analysis

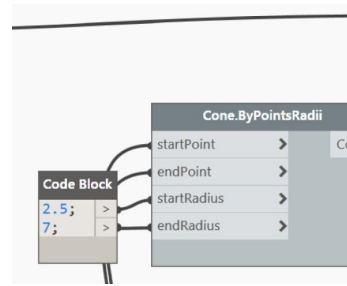


Mapping, Categorical: Off, cold, warm, hot

~~Mapping, Magnitude, Colder -> Warmer~~

Mapping, Direction(!!!), Colder -> Warmer

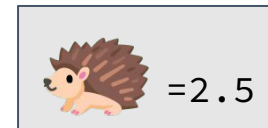
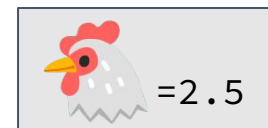
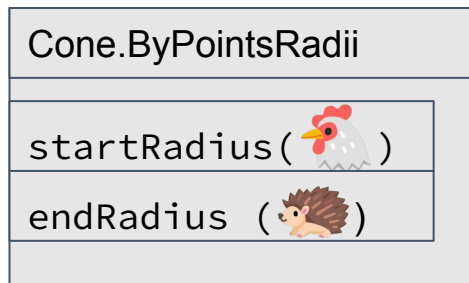
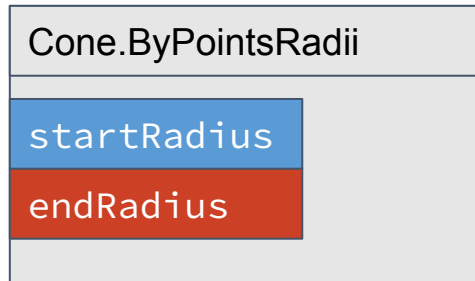
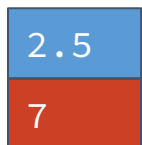
Use 2: Generating divergent designs



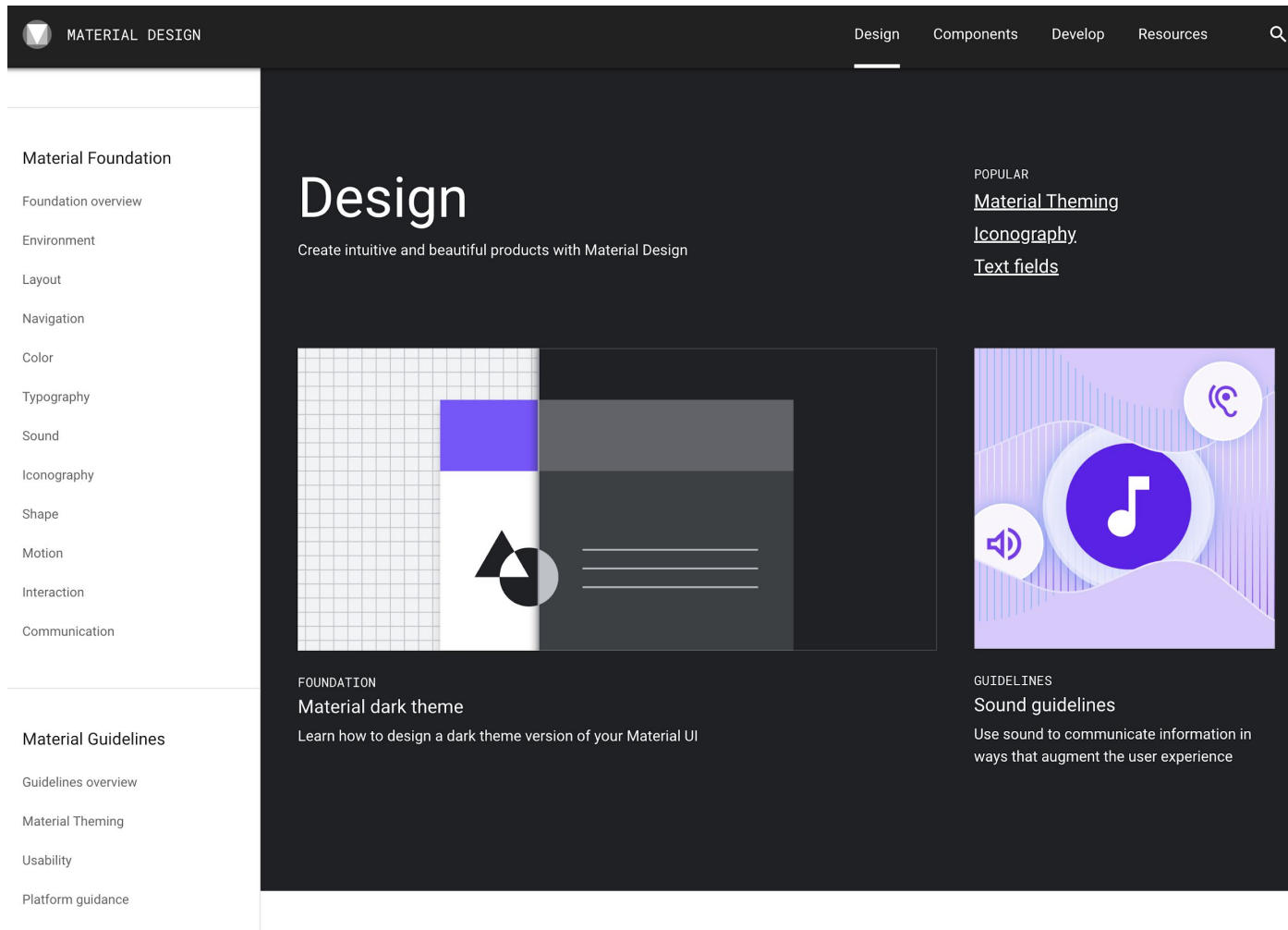
- Topological linking

=>

- Arbitrary conventional



Use 3: Design systems



Color usage

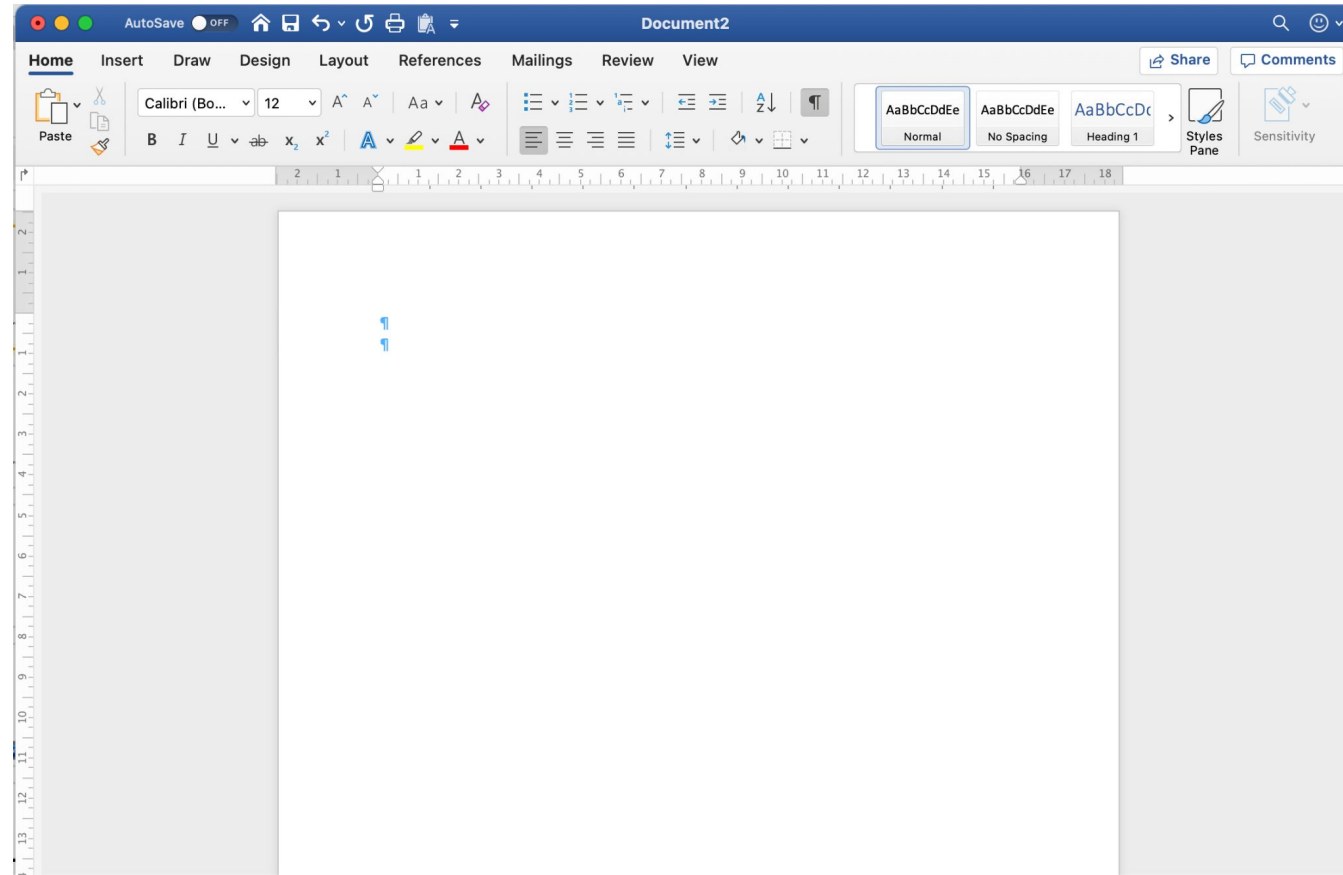
Color helps express hierarchy, establish brand presence, give meaning, and indicate element states.

- CONTENTS
- Hierarchy
 - Brand
 - Meaning
 - State

(<https://material.io>)

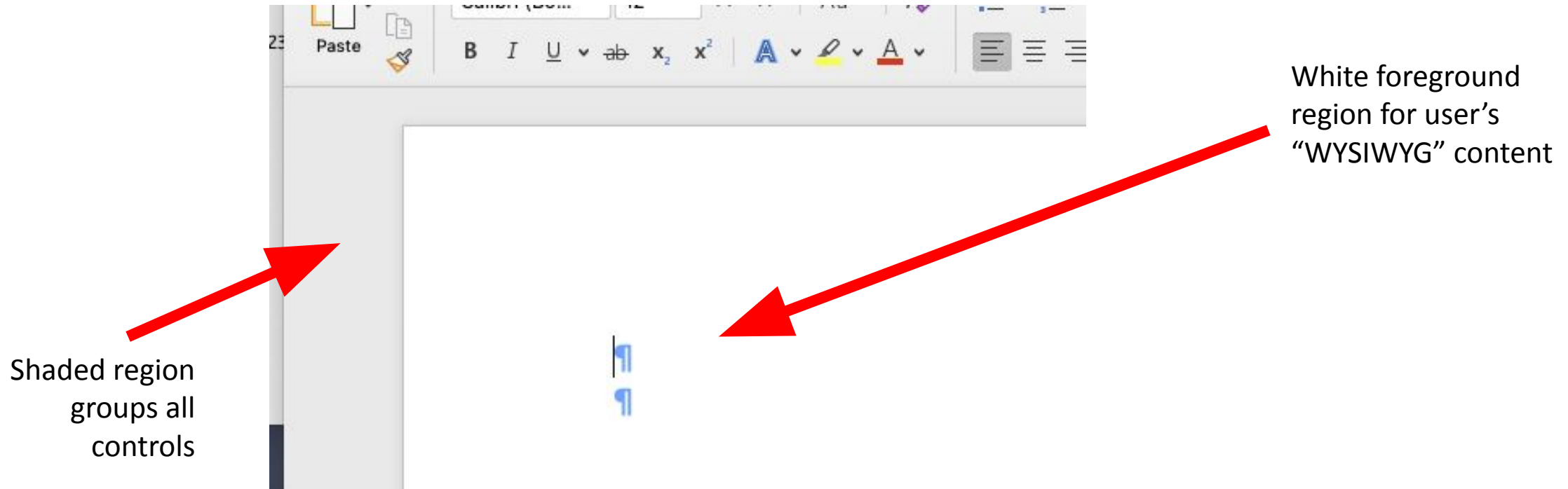
Analysing visual representation in a UI

Look more carefully at familiar things ...



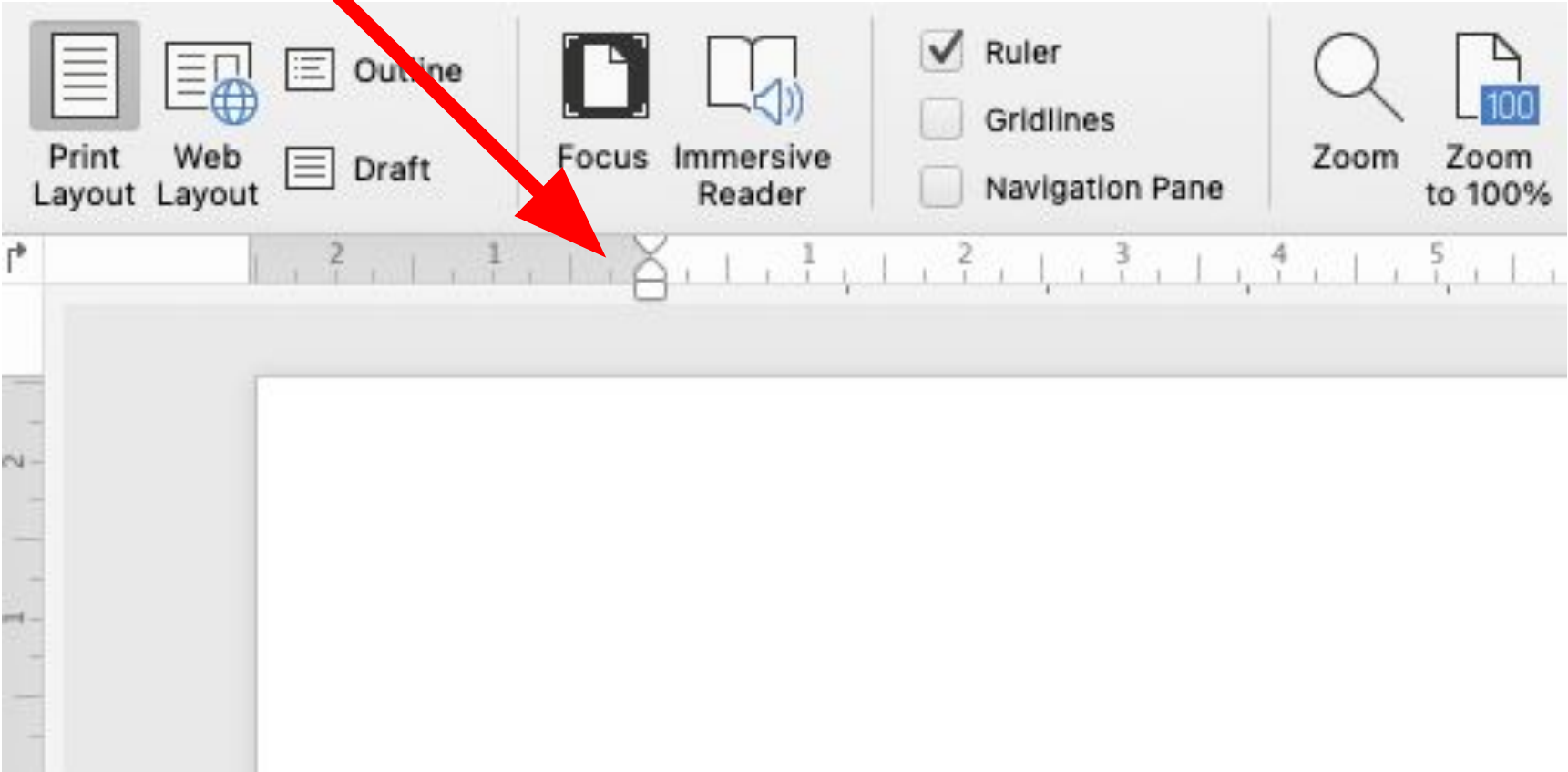
Analysing visual representation in a UI

Shaded regions define separate functional contexts



Analysing visual representation in a UI

Coordinate space for quantitative calculation of grid layout



Analysing visual representation in a UI

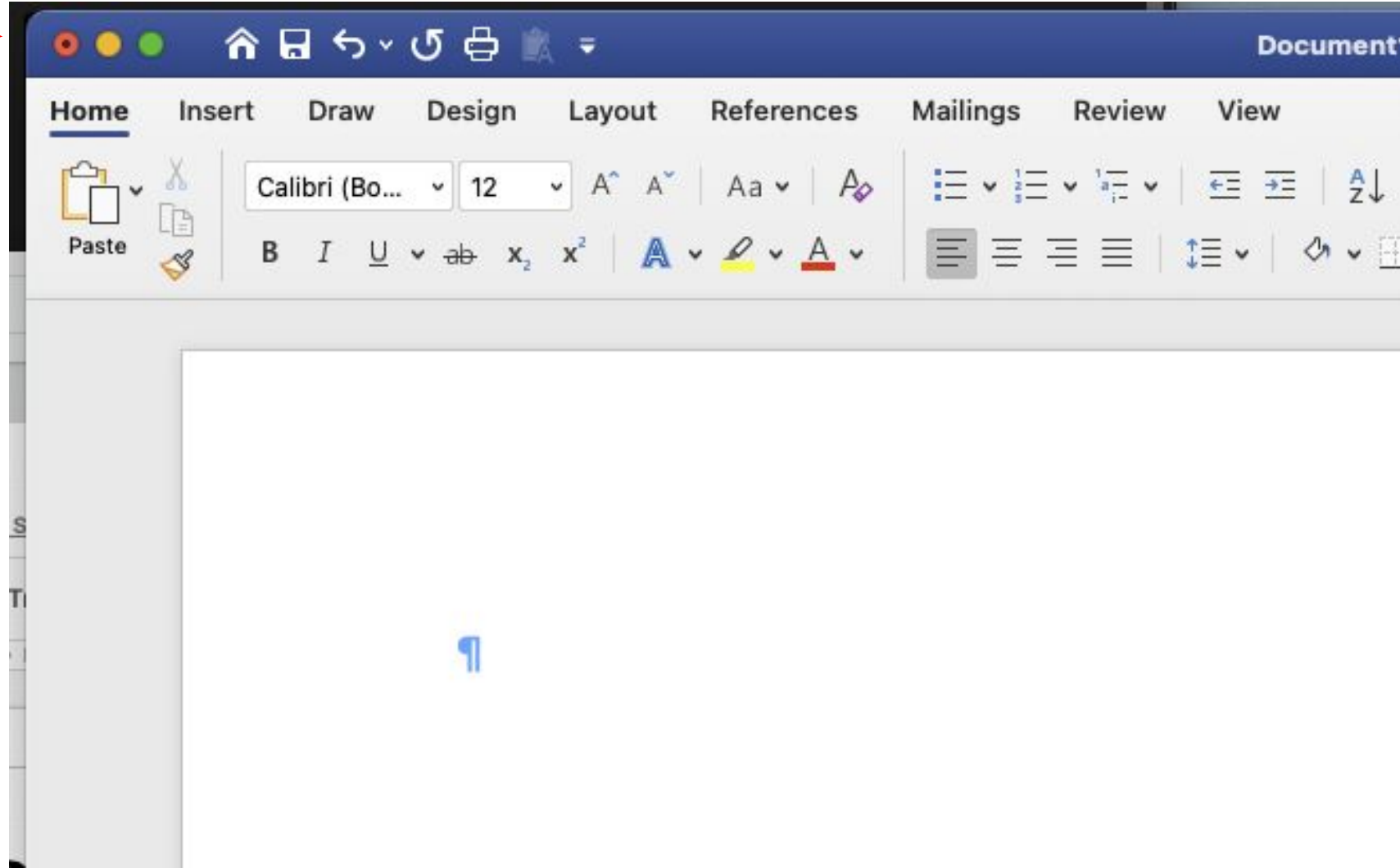
Blue coloured border:

1. Corporate identity
(cf IBM)

2. Context within
Office suite - Excel
docs have green
borders, PPT are
orange.



IBM



Analysing visual representation in a UI

How do we read these?

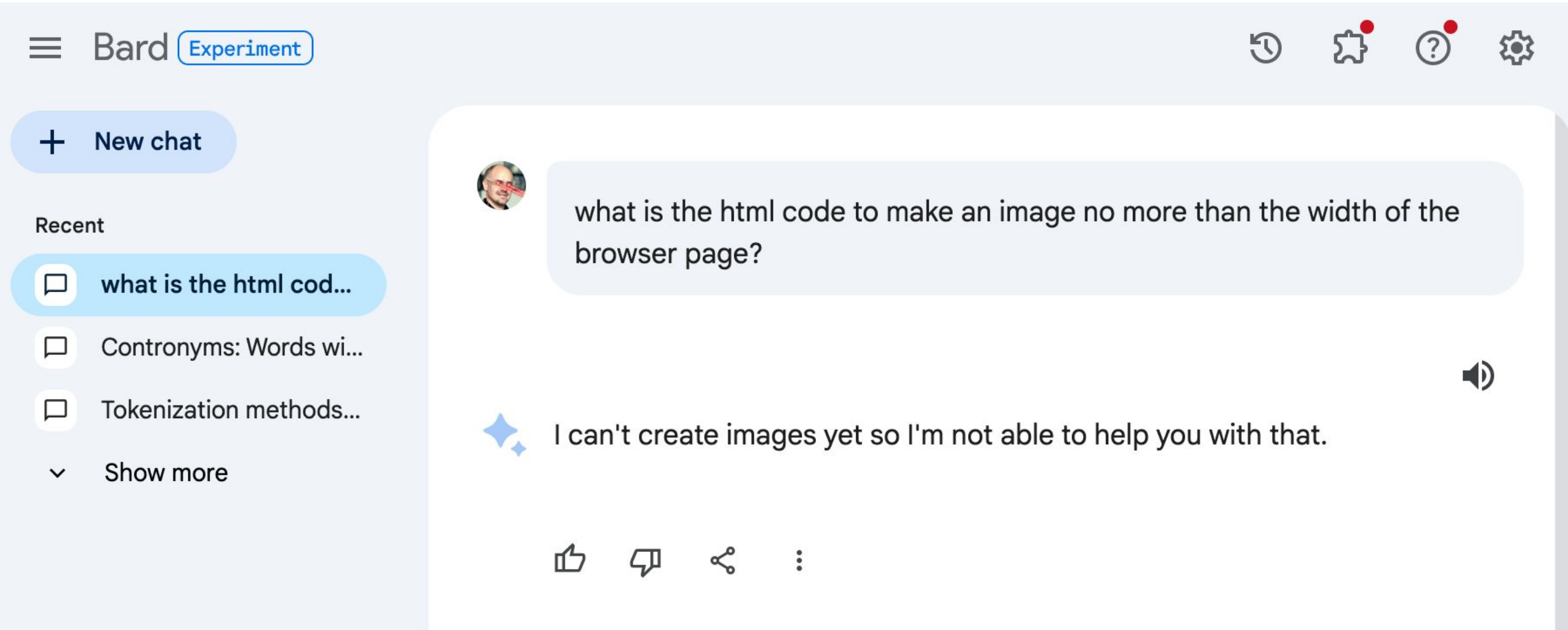


Difficult standards:
When the designer's mental
model differs from the user's
mental model



The programming analogy challenge 2024:

Example #1: ChatGPT (actually Google Bard)



The screenshot shows the Google Bard chat interface. At the top left, there is a menu icon, the text "Bard", and a blue pill-shaped button labeled "Experiment". To the right of this are four icons: a clock, a puzzle piece, a question mark, and a gear. Below the header, on the left side, is a "New chat" button with a plus sign. Underneath it is a "Recent" section with a list of chat titles, each preceded by a document icon. The first title is "what is the html cod...", which is highlighted with a blue background. Below it are "Contronyms: Words wi..." and "Tokenization methods...". At the bottom of this list is a "Show more" option with a downward arrow. The main chat area on the right contains a user's question in a light blue bubble: "what is the html code to make an image no more than the width of the browser page?". Below the question is the AI's response in a white bubble: "I can't create images yet so I'm not able to help you with that.", which is preceded by a blue starburst icon. At the bottom of the response bubble are four icons: a thumbs up, a thumbs down, a share icon, and a vertical ellipsis.

≡ Bard Experiment

+ New chat

Recent

- what is the html cod...
- Contronyms: Words wi...
- Tokenization methods...
- Show more


what is the html code to make an image no more than the width of the browser page?

✨ I can't create images yet so I'm not able to help you with that.

👍 🗨️ 🔄 ⋮

Example #1: ChatGPT (actually Google Bard)



what is the html code for img tag width of page? 

Regenerate draft  



Here are two ways to set the width of an image to the full width of the page in HTML:

1. Using the `width` attribute:

HTML

```
<img src="your-image.jpg" width="100%" alt="Image descriptio
```

Use code with caution. [Learn more](#)



Example #1: ChatGPT (actually Google Bard)

HTML

```
<img src="your-image.jpg" width="100%" alt="Image descriptio
```

Use code with caution. [Learn more](#)



- Set the `width` attribute to `100%` to make the image stretch to the full width of its container, which is usually the page itself.
- Always include the `alt` attribute to provide alternative text for accessibility and SEO.

2. Using CSS:

HTML

```
<img src="your-image.jpg" class="full-width" alt="Image desc
```

Example #1: ChatGPT (actually Google Bard)

- Use responsive image techniques to serve different image sizes for different screen sizes.
- **Responsiveness:** For a truly responsive solution that adapts to different screen sizes, consider using CSS media queries to adjust the image's width based on the viewport width.

Additional tips:

- **Image optimization:** Optimize your images for web use to reduce file size and improve loading times.
- **Alternative text:** Always provide meaningful alternative text for images to improve accessibility and SEO.

Best practices recommend using CSS for styling elements, including image width. The `width` attribute can still be used as a fallback for older browsers or when inline styling is necessary.

Example #1: ChatGPT (actually Google Bard)



How can I tell my Alexa to close the curtains automatically when it gets dark?



View other drafts 



There are a few ways to tell your Alexa to close the curtains automatically when it gets dark, depending on the specific smart home setup you have and the capabilities of your curtains. Here are a few options:

Using Routines:

1. **Alexa app:** Open the Alexa app on your smartphone or tablet. Tap on "Routines" and then "Create Routine." Choose "When this happens" and select "Smart Home" followed by "Schedule" or "Sunset." Set the desired time or choose "Sunset" as the trigger. Then, choose "Add action" and select "Smart Home" again. Choose your curtains and select "Close." Save the routine and name it something like "Close Curtains at Sunset."
2. **Voice command:** Once you have created the routine, you can simply say "Alexa, activate Close Curtains at Sunset" to trigger it.

Summary: ChatGPT (or Gen AI) as programming language

If we were designing a language for *instructing computers what to do*, should it look like English?

The *AI alignment problem* - how do we know whether a computer will do what we really want, rather than follow its own ideas?

If you're a computer scientist rather than a philosopher, these problems look very familiar!

- a) specification & coding
- b) testing & debugging