

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, egyptian god, egyptian god 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 precors. de-
dit et suauissimas
lras. q̄ a principio
amiciat. sic. p̄-

et iam h̄cā et veteris amicitie noua:
p̄fectant. Et ita tū illa necessitudo ē
et xpi glorio copulata. q̄m non vali-
tas et familiaritas. nō p̄cā tuncum
corpor. nō s̄cōla et palpias adulato-
sed dei amor. et diuina: scripturarū
studia conualiant. legim⁹ in veteribz
hystoris. quosdā iustitias. p̄uicia. a.
nouos adisse p̄los. maria etā iuste.
ut eos quos et libris nouerant. corā
q̄ videret. Sicut piragoras mōphi-
nicos viros. sic plato egip̄i. et archimē-
tarcum. cantōq; oram r̄alit. que
quondā magna grecia dicebat. labo-
riōsissime peragravit. et ut qui athenis
m̄p̄ erat. et potius. n̄m̄q; dōctinas
achadum gignasū p̄sonab̄. h̄er
p̄gnus atq; discipulus. malēs alicui
veterē discere. q̄m sua sp̄denti iugē.
Deniq; tū lras quasi toto ore fugien-
tes p̄sequit. cap̄ a picanis et uenūda-
tus. orāno crudelissimo p̄uic. dūc⁹
rapimus vinct⁹ et seruus. Tamē quia
plius maior euenit se h̄c. ad orum
lūm. ladeo eloquēcie fonte manantē.
et vltimis hystorie galliarūq; h̄m̄bz.
quosdā uenisse nobiles legimus. et
quos ad exemplarōne sui roma nō
caecat. vni⁹ hōis fama p̄dure. Ha-
bit illa etas inauditiōn̄ om̄bz seculis.
celebrandūq; miracū. ut urbē tanta

ingressi. aliud terra urbem querebant.
Apolloni⁹ fuit ille mag⁹ ut vulg⁹
loquitur. fuit p̄lus. ut piragora na-
dunt. incauit plas. p̄cūnt caucasi.
albanos. scythas. mallagras. opulē-
tissima indie regna p̄uicauit. et ad
geramū lanissimo phison ampu-
cūm̄ p̄uic ad braguanas. ut
braccam in throno sedent aucto et de
cantalī fonte p̄oatōn. inter paucos
discipulos. de natura. et moribz. ac de
cūsu diei et h̄dei. audire docerant.
Iude p̄ damias. babilonios. chalde-
os. medos. alirios. parthos. h̄ros.
pharicos. arabes. palestinos. r̄isus
ad alleaudriā. p̄c̄q; ad ethiopiā.
ut gignosophistas et famosissimam
solis mensam videret in sabulo. In-
uenit ille vir ubiq; q̄ disceret. et semp
p̄dicēs. semp se melior fieret. Scrip-
sit super hoc planissime octo volumi-
nibus. phisosteano.

Quid loquar de seculi hominibus.
cū ap̄tus paulus. vas electōm̄.
et magister gentiū. qui de consensu a-
n̄i i se hospitis loquebat. dicit. An
examinā queras eius qui in me
loquit̄ xpi. Post damascū arabisq;
iustitias. alcedū iherosolimā ut videt
p̄cū et m̄s̄r apud tū diebz quindē.
H̄or tū n̄ctio ebdomadis et ogdo-
ad̄. h̄m̄q; gentiū p̄dicatōr. instructus
dus erat. R̄clūq; post ānos quior-
decim assumptō barnaba et oro. exp̄-
sue tū ap̄tus cōāgetū. ut fore in va-
cūm curaret aut curā iustit. H̄aber
n̄ctio q̄d latinis emergit. v̄nt uos
ad̄. et in aures discipuli de auctoris
ore manifestā. foreius sonat. Unde et
ethim̄s cū rodī gulara. et legatur

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

IEEE Software: Behavioural Scier | nook-experimental - Database | console.firebase.google.com/u/1/project/nook-experimental/dat... | 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)

Blaze | Pay as you go | Modify

Project Overview | Develop | Quality | Analytics | Blaze

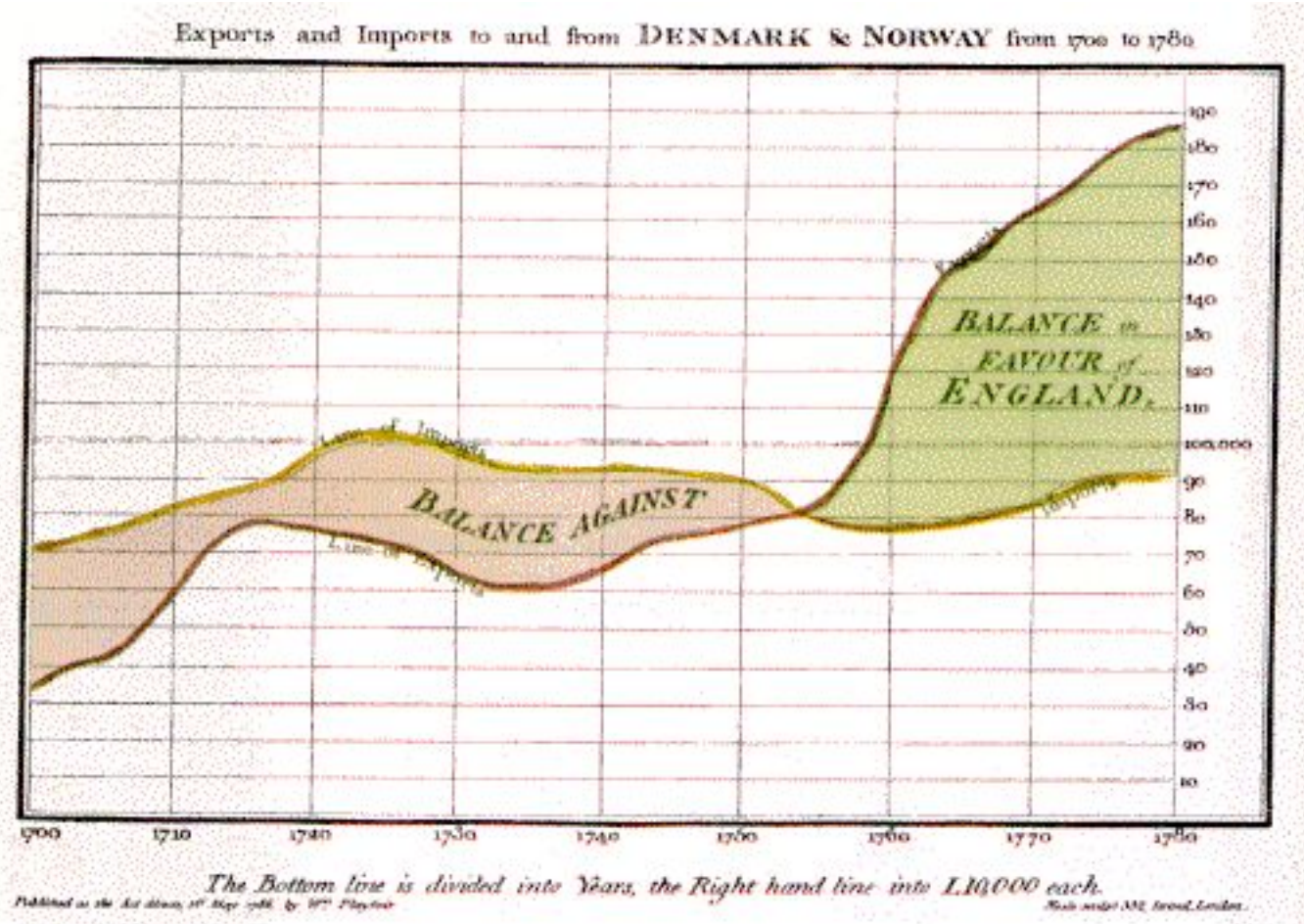
- Authentication
- Database
- Storage
- Hosting
- Functions
- ML Kit
- Crashlytics
- Performance
- Test Lab
- App Distribution
- Dashboard
- Events
- Conversions
- Audiences
- Funnels
- User Properties
- Extensions

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

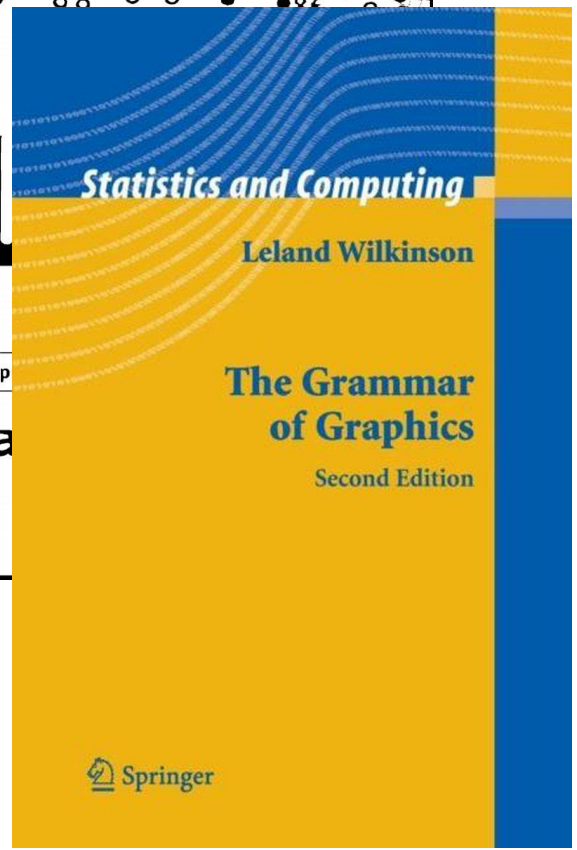
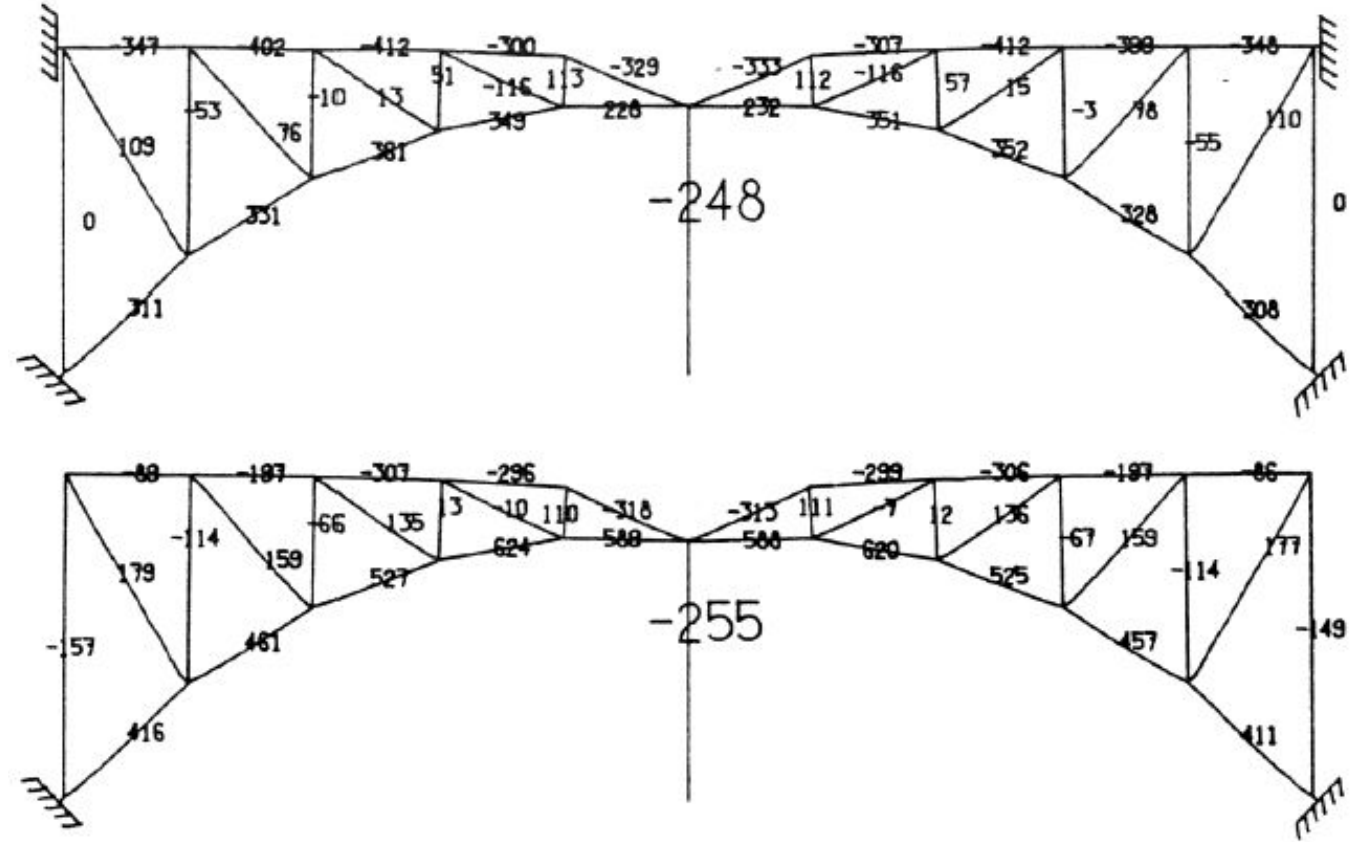
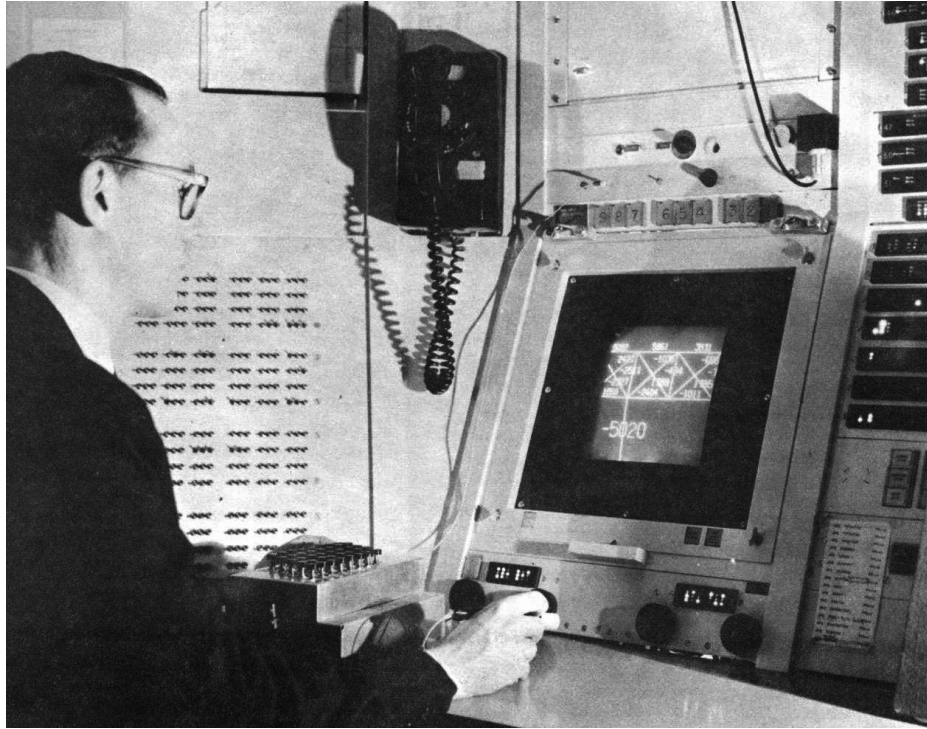


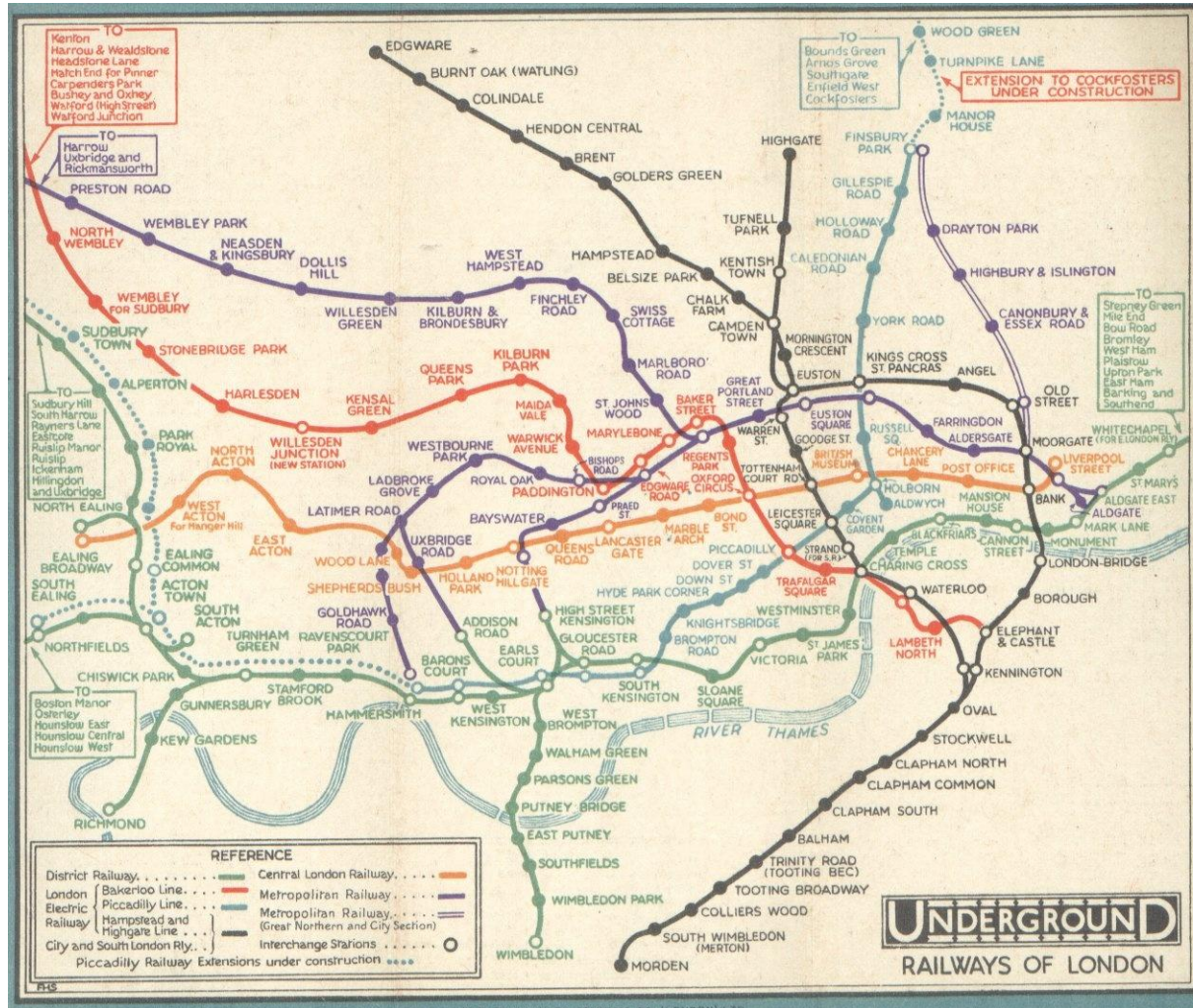
Figure 1. The visual variables and their effectiveness in signifying the three levels of measurement of data (after Bertin [1983]).

SCHEMATIC DRAWINGS

Sutherland's Sketchpad (1963)

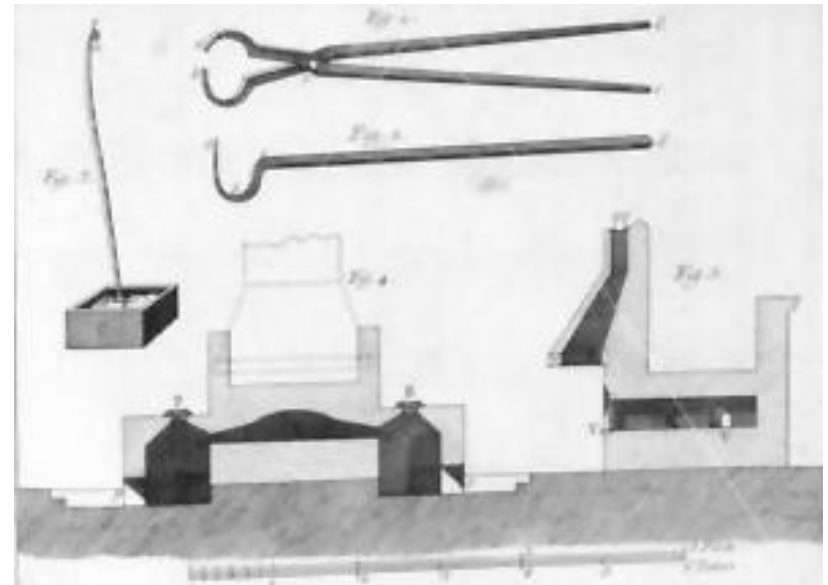
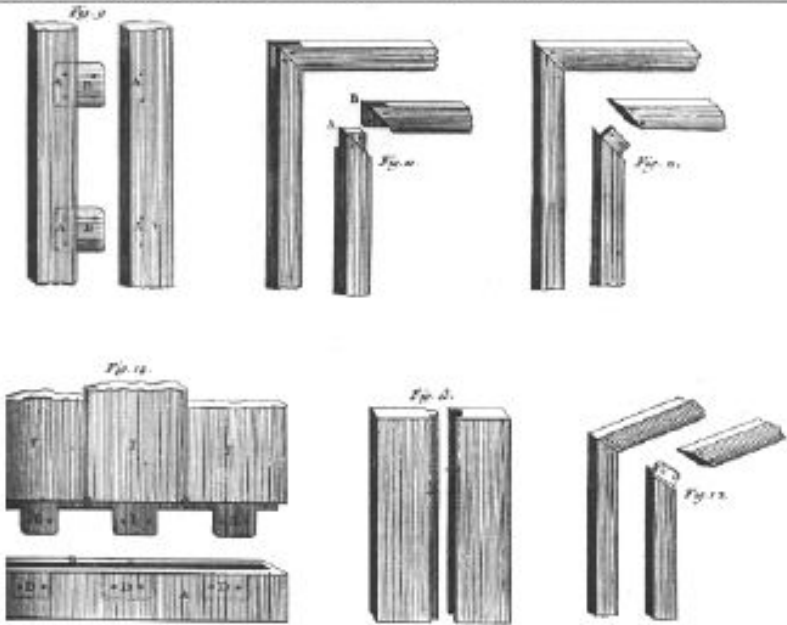
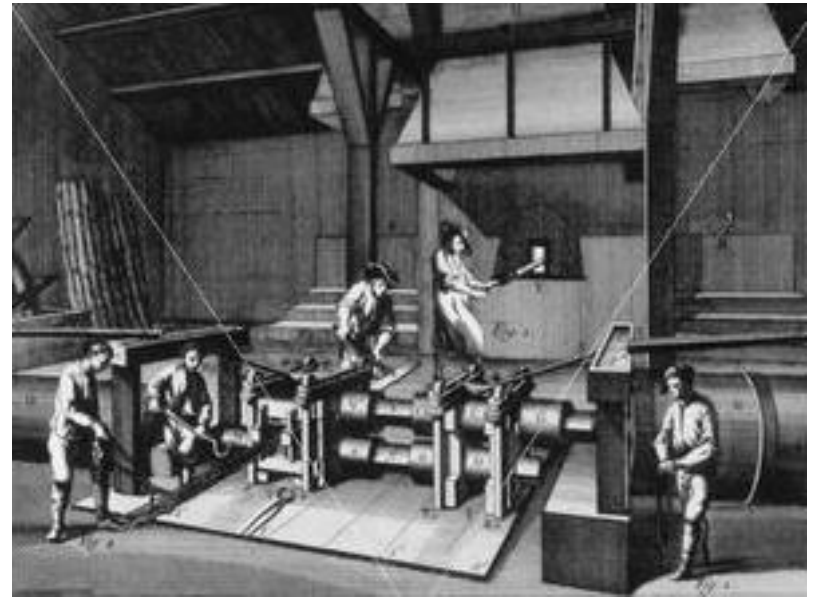
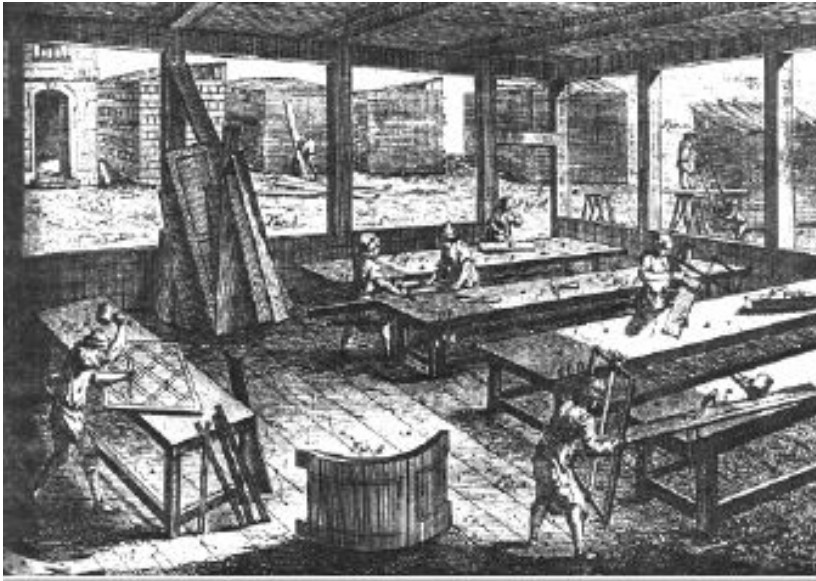


The London Underground Map (1920)



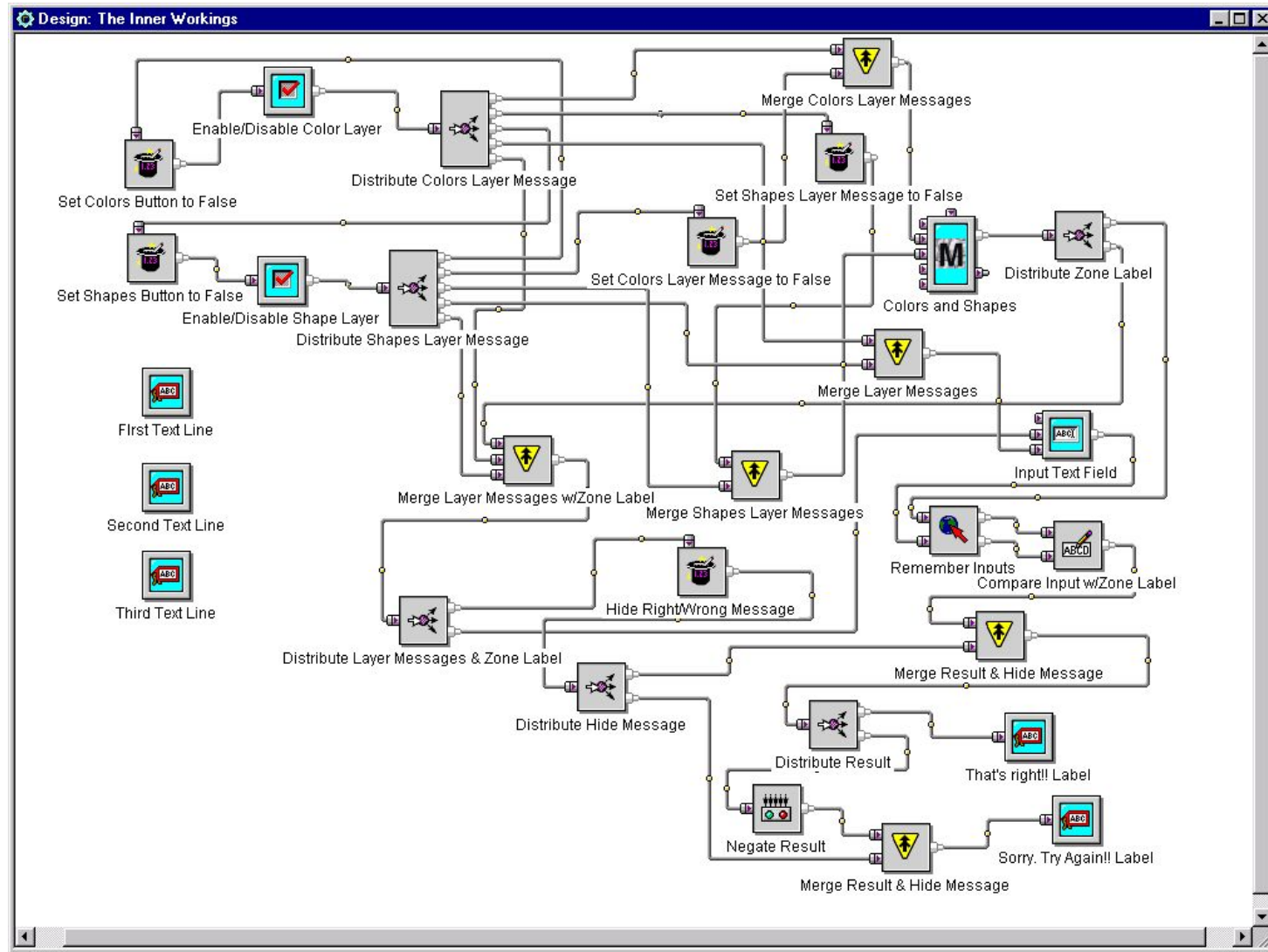
Henry Beck's London Underground Diagram (1931)





NODE-AND-LINK DIAGRAMS

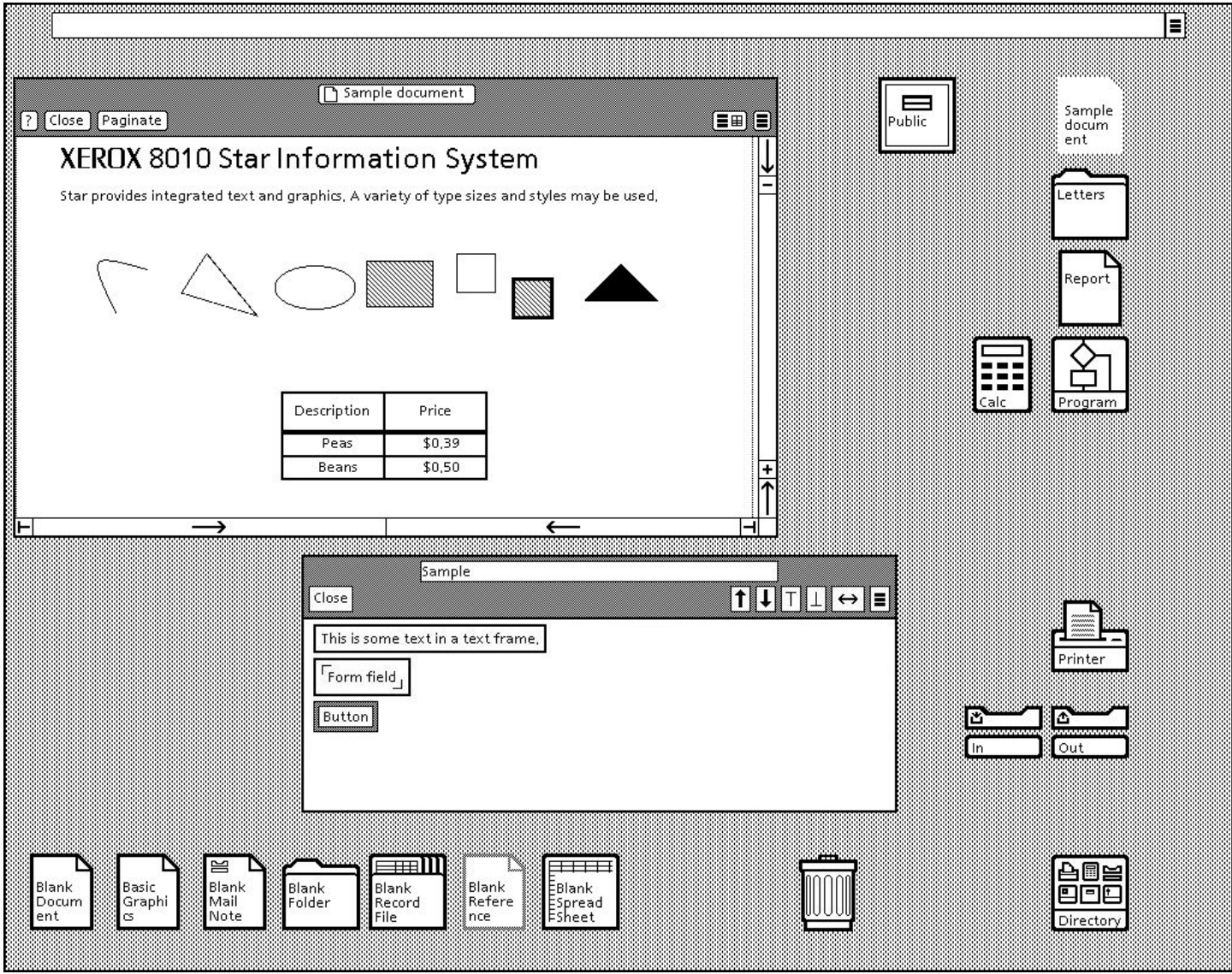
The future of “no-code / low-code”? Java Studio (1995)



ICONS AND SYMBOLS



VISUAL METAPHOR

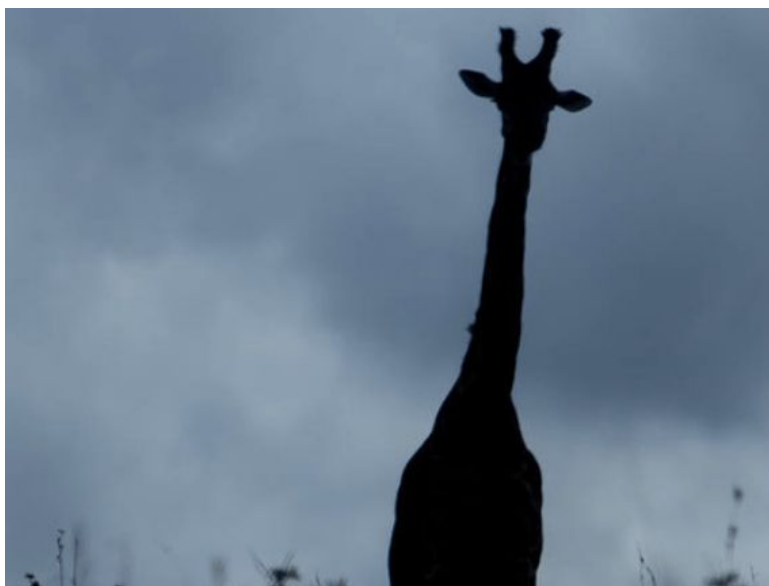




PICTURES







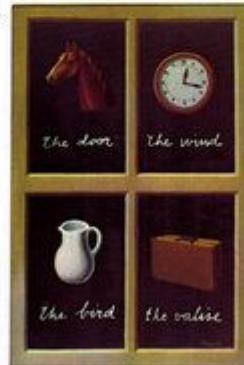


WAYS OF SEEING

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

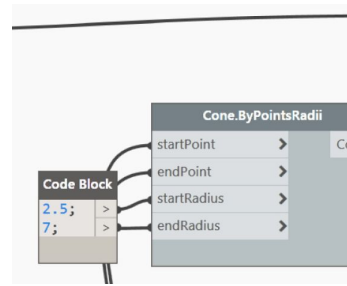


Mapping, Categorical: Off, cold, warm, hot

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

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

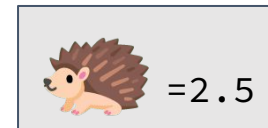
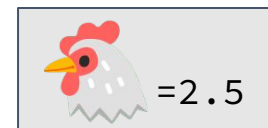
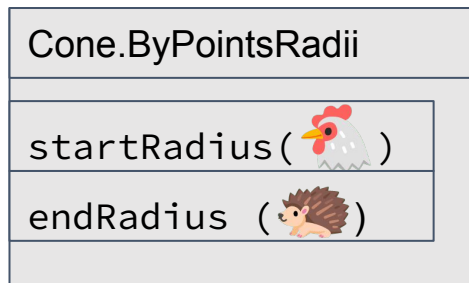
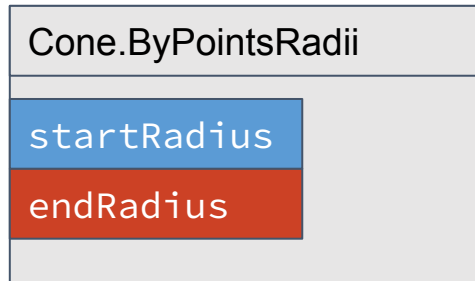
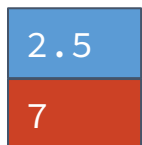
Use 2: Generating divergent designs



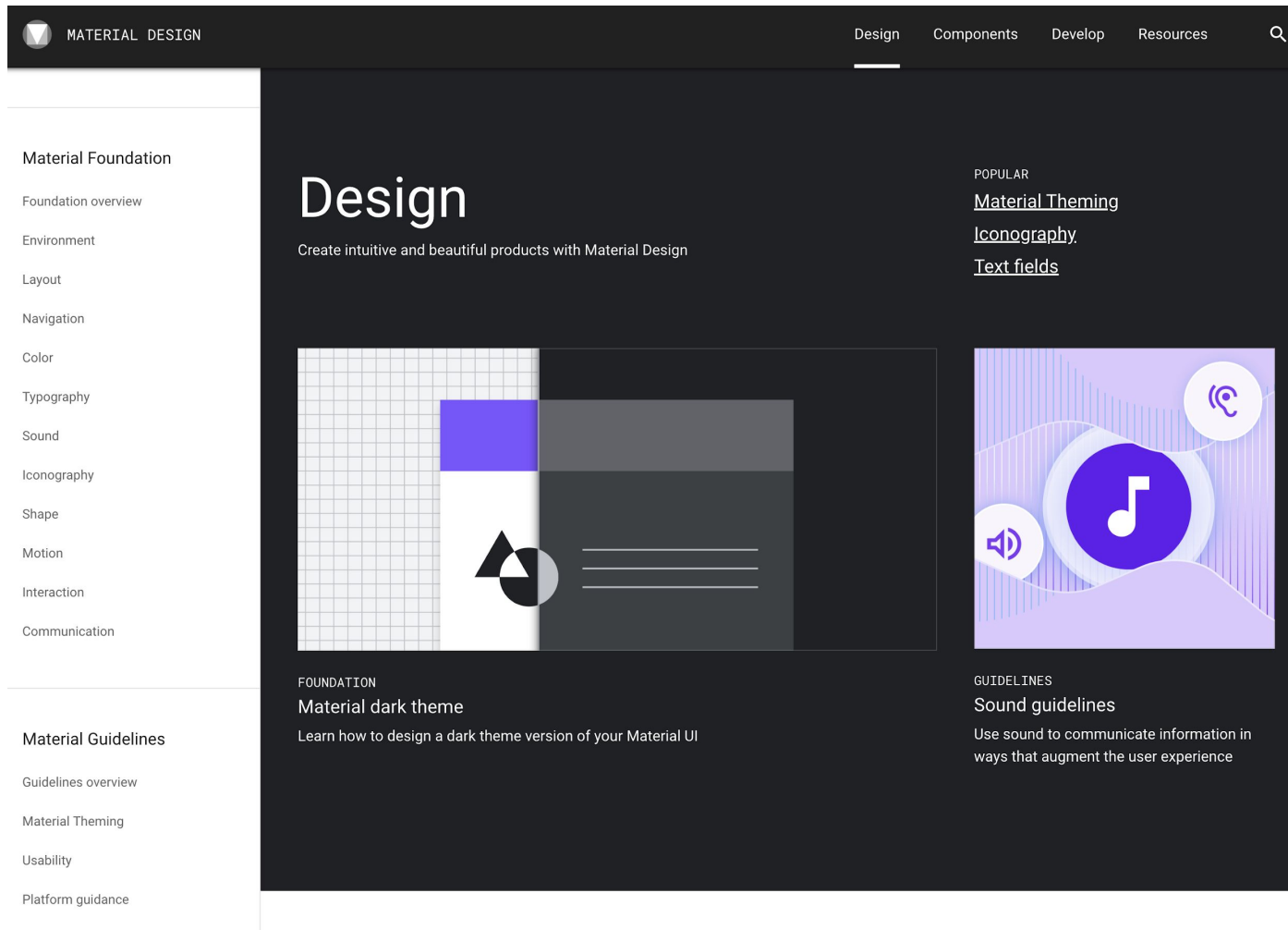
- Topological linking

=>

- Arbitrary conventional



Use 3: Design systems



Color usage

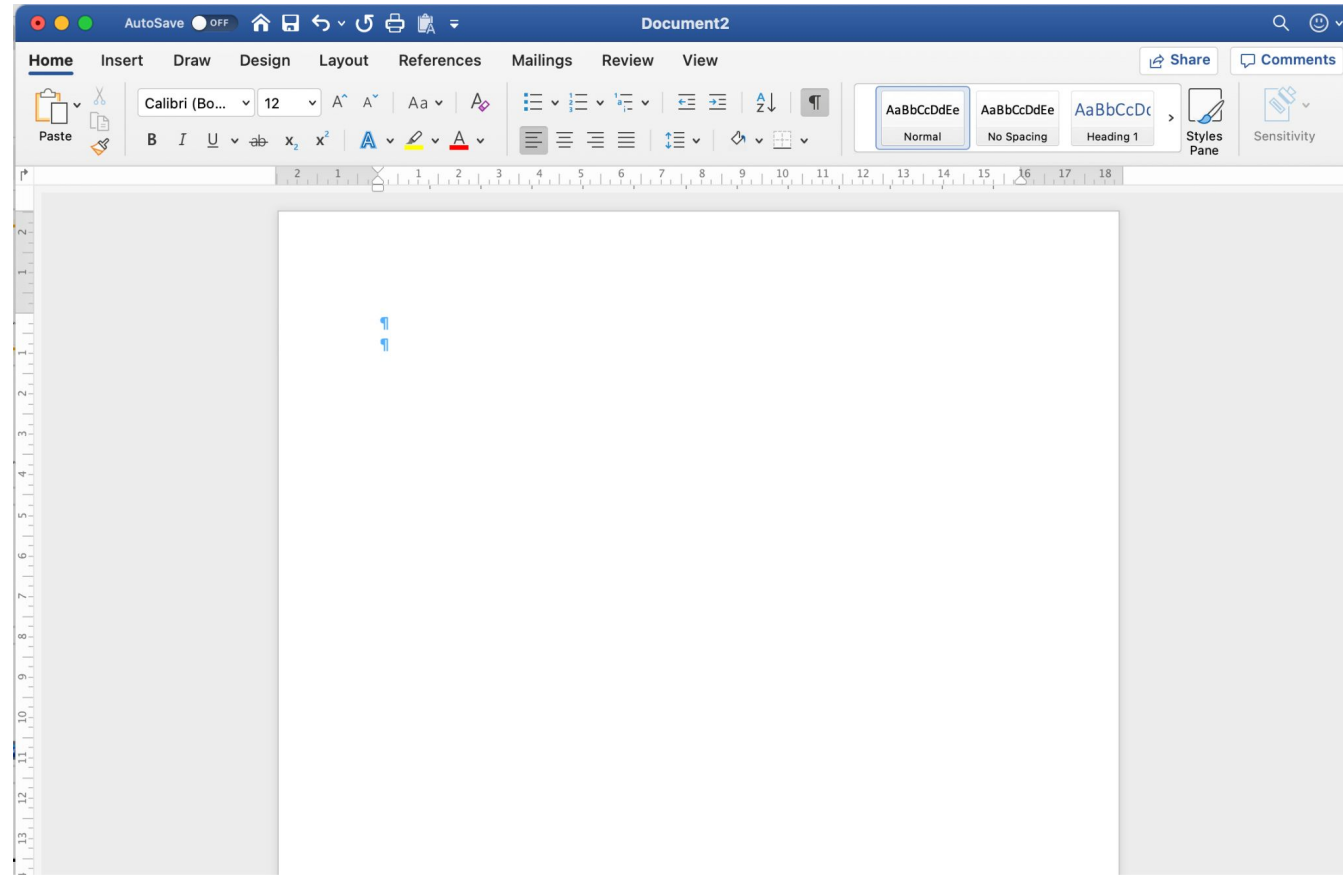
Color helps express hierarchy, establish brand presence, give meaning, and indicate element states.

- CONTENTS
- Hierarchy
 - Brand
 - Meaning
 - State

(<https://material.io>)

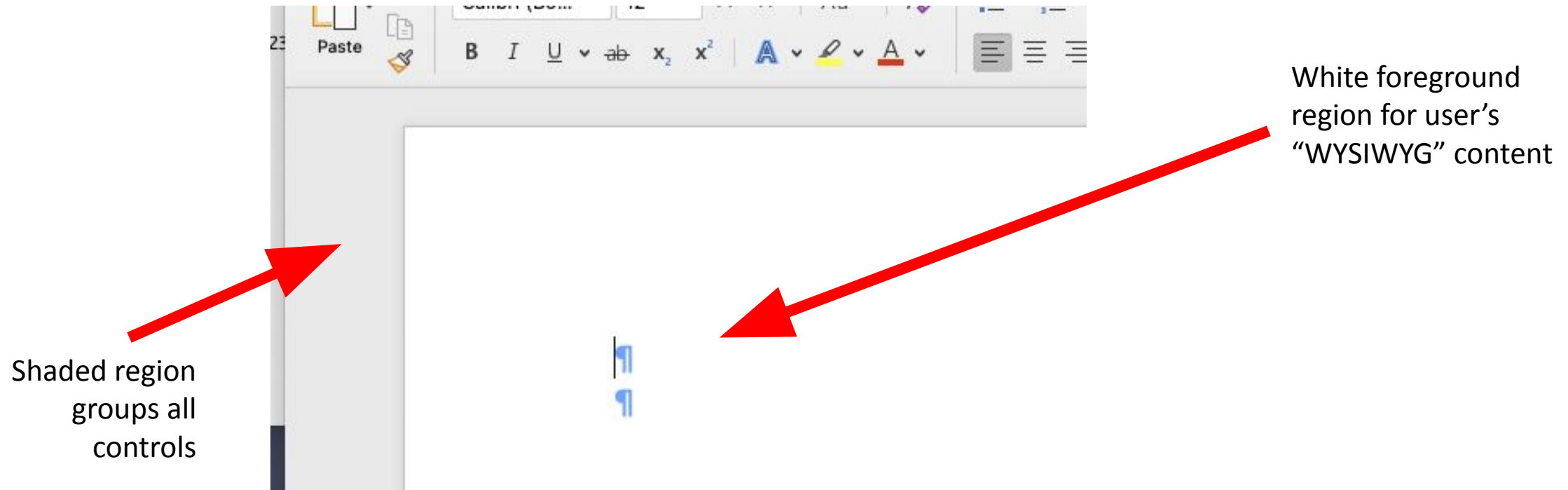
Analysing visual representation in a UI

Look more carefully at familiar things ...



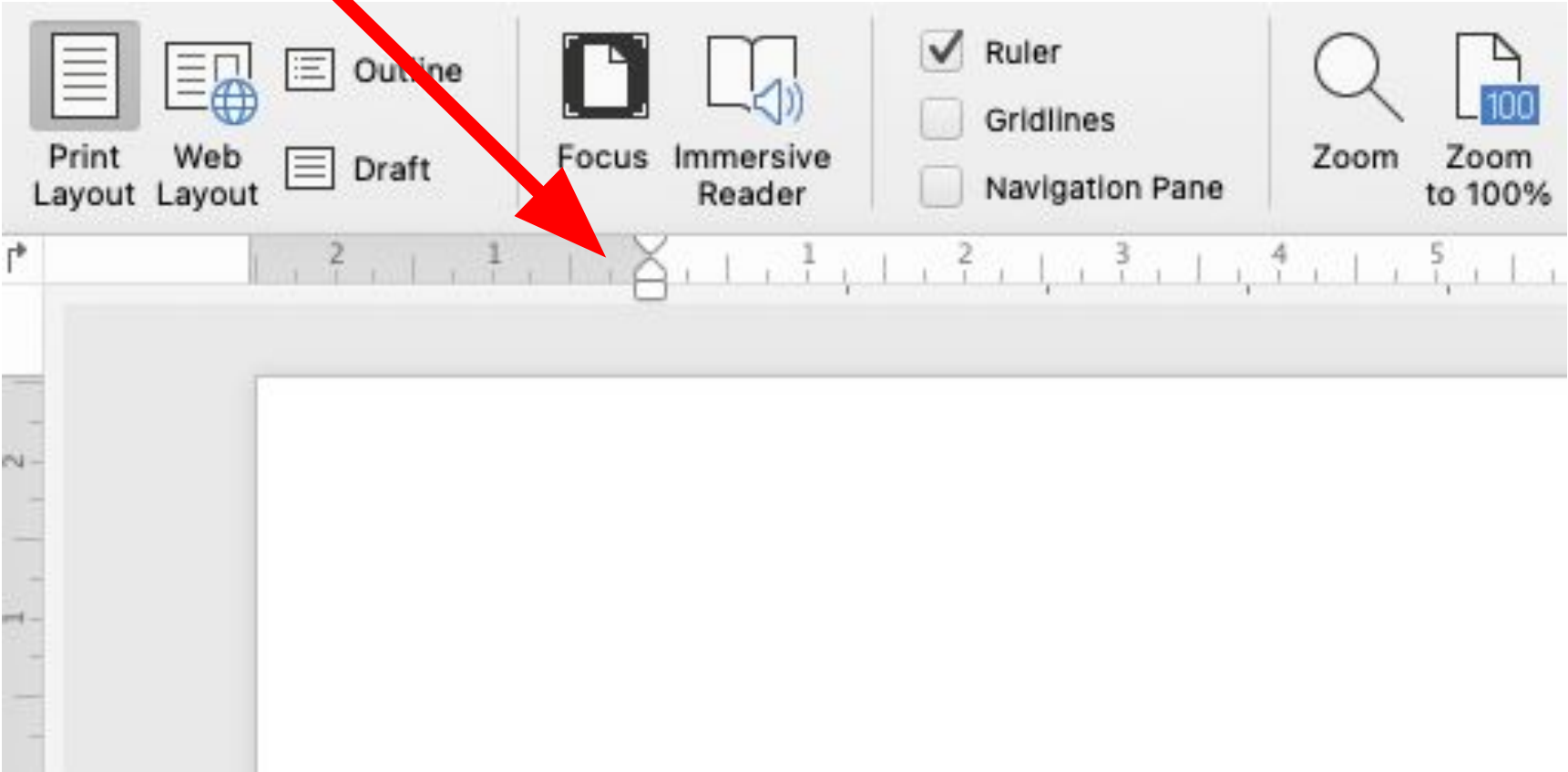
Analysing visual representation in a UI

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

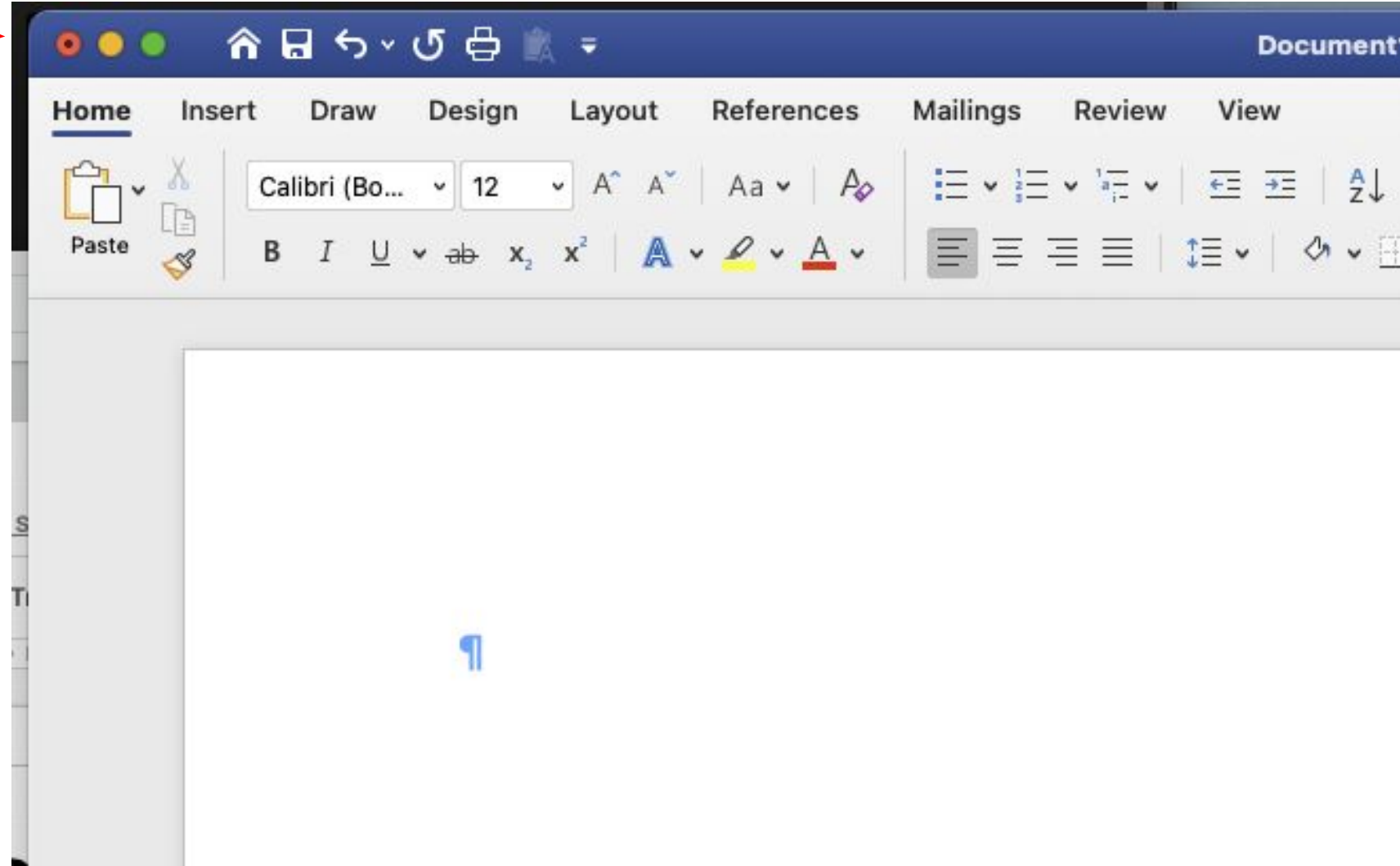
Blue coloured border:

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

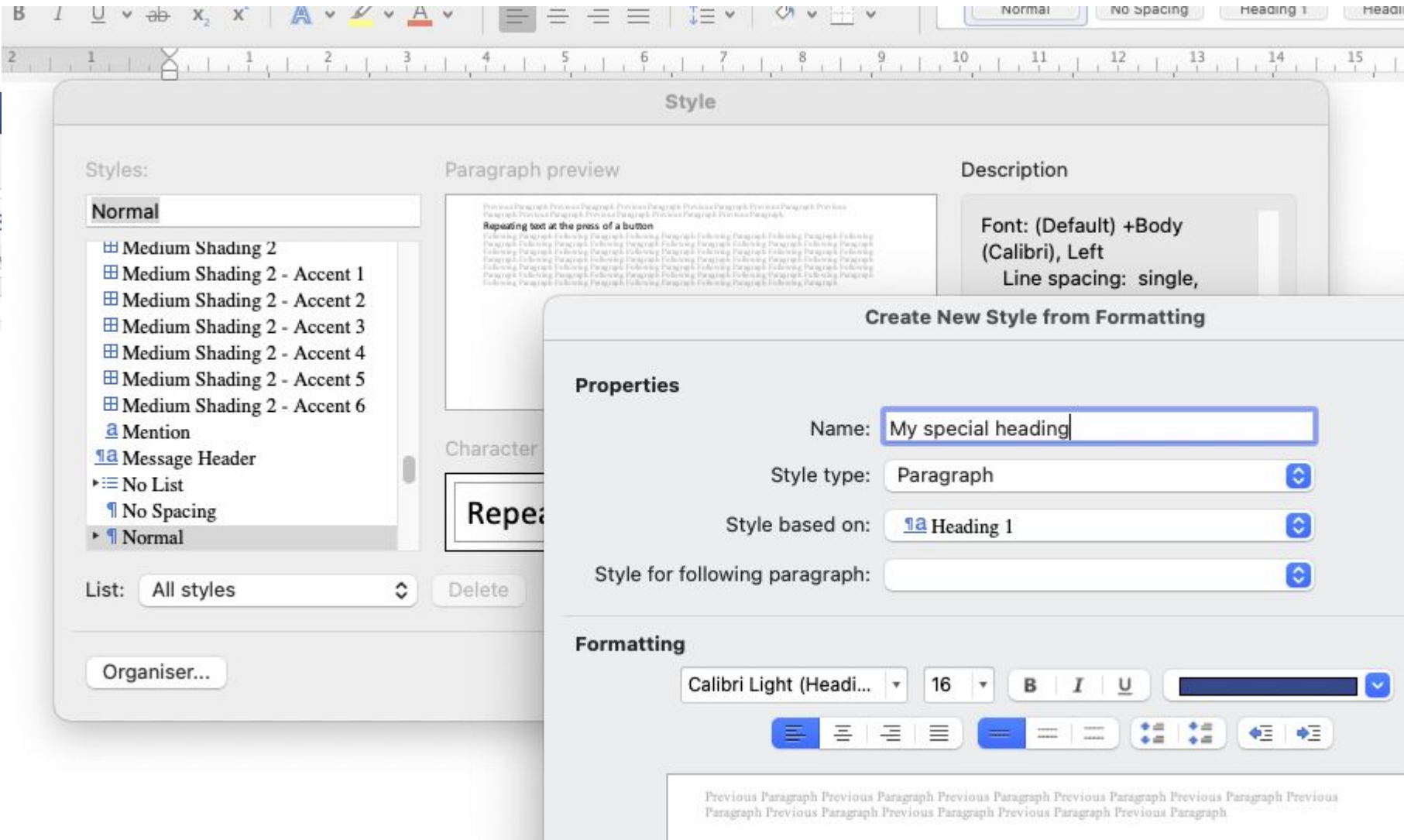
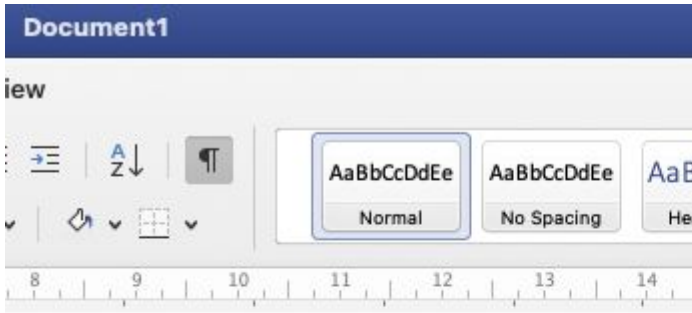
How do we read these?



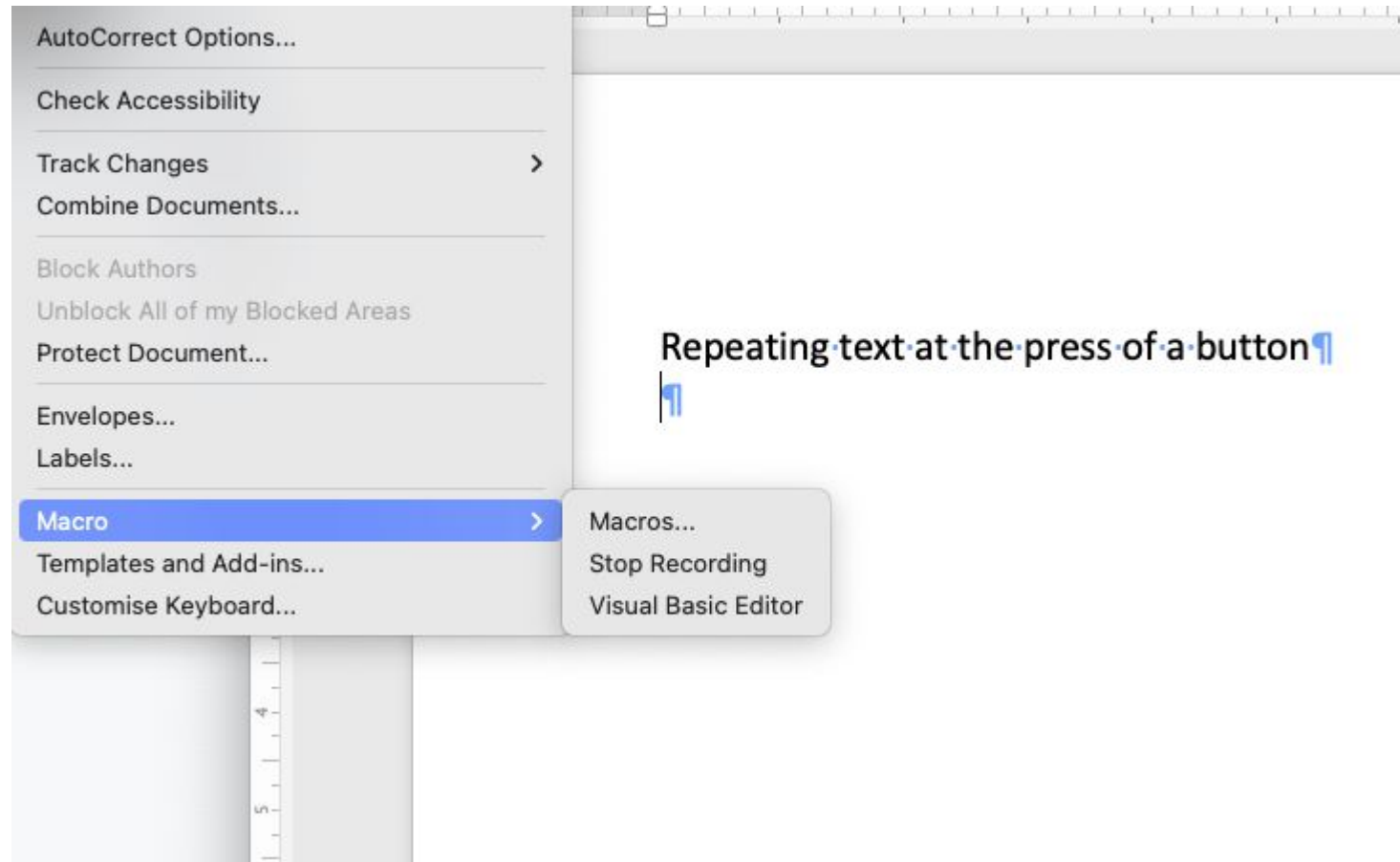
Difficult standards:
When the designer's mental
model differs from the user's
mental model



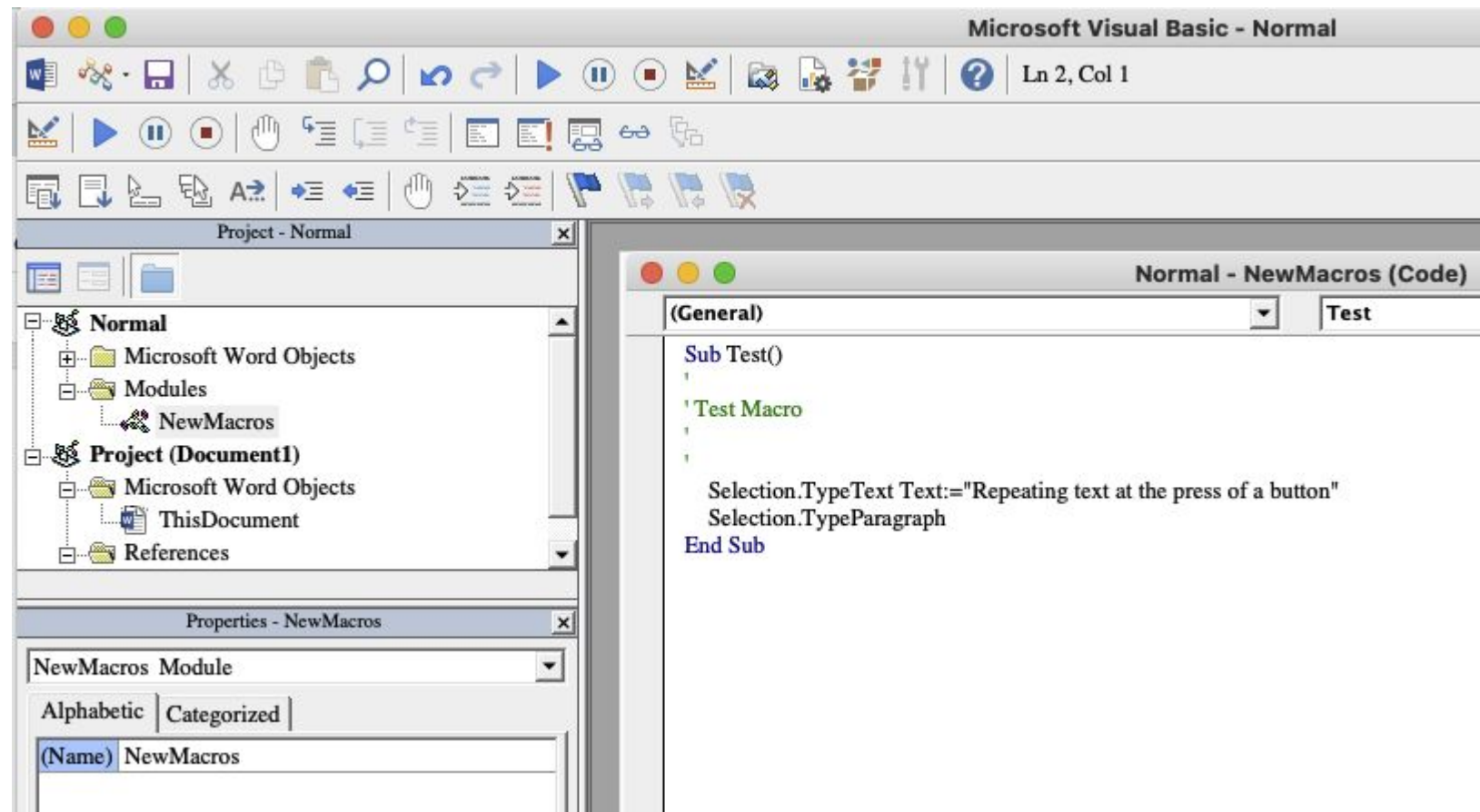
The programming analogy challenge 2023: text editors



The programming analogy challenge 2023: text editors



The programming analogy challenge 2023: text editors



The programming analogy challenge 2023: text editors

Repeating text at the pre
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