Navigation and Information Architecture

Week 3 Lecture P1

MONASH
University

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Learning objectives

Information Architecture

- Relationship to usability

- Key components of IA

- IA design methods

Menu Types and Guidelines

- Desktop and mobile menus

- Implementation guidelines

Icon Design Guidelines

- Icon classification

- Icon visual design guidelines

Assignment Project Stage C + D

Information Architecture

What is Information Architecture?

Information architecture (IA) focuses on organizing, structuring, and labeling content in an effective and sustainable way.

- Help users find information
- Help users complete tasks.
- Understand how pieces fit together to create the larger pictures
- Understand how items relate to each other systems.

Consider: *What do you hate most about **[insert complex website here]** ?*

(Feel free to think about your own experience with websites)

Information structures should feel natural

The Interfaces we create allow users to locate, create, manage and interact with information.

"Good design, when it's done well, becomes invisible. It's only when it's done poorly that we notice it."

- Jared Spool, User Interface Engineering

Through the application of usability principles, and structuring of information with users in mind, the **information architecture becomes invisible**.

Information architects are...

ARCHITECTS OF UNDERSTANDING

We help our users to understand where they are, what they've found, what to expect, and what's around.
We help our clients to understand what's possible.

- Peter Morville

Key components of Information Architecture

Important components identified by Peter Morville and Louis Rosenfeld:

- **Organisation Systems**
  - Organisation Schemes
  - Organisation Structures

- **Labeling Systems**

- **Navigation Systems**

- **Search Systems**
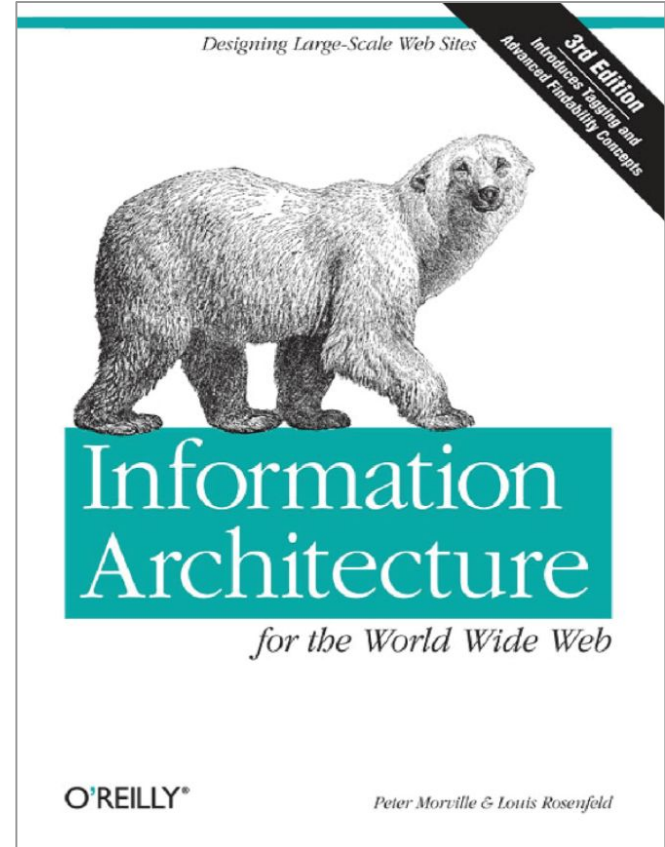
Organisation schemes

Organisation schemes consider how to categorise and sequence items of information in a way the forms meaningful relationships between them.

Organisation schemes can be:

- **Exact**, based on ==objective== rules.
  - Grouping information into mutually exclusive categories.
  - Sequence information in a consistently reproducible way.

- **Ambiguous**, based on ==subjective== rules.
  - Group information based on meaningful association to themes.
  - Sequence information in a meaningful, but convenient, way.

Organisation schemes

Department

Computers

Accessories

Components

Data Storage

Desktops

External Components

Laptop Components & Replacement Parts

Laptops

Monitors

Networking Devices

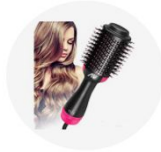Printers, Ink & Accessories

Scanners

Tablet Components & Replacement Parts

Tablets

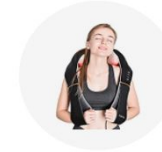**Featured categories**

Medication & Remedies

Hair Care

Shaving & Hair Removal

Household & Cleaning

Wellness

Bath & Body

Medical Supplies & Equipment

Recommended for you

20^{00}

Quilton 3 Ply Toilet Tissue (180 Sheets per Roll,...
★★★★★ 2,068

14^{95}

William Klein 50 PCS Face Mask 3 Ply Breathable E...
★★★★☆ 645

20^{72} ~~$24.00~~

HUGGIES Thick Baby Wipes Fragrance Free...
★★★★½ 799

20^{00}

Quilton 3 Ply Extra Thick Facial Tissues Hypo-...
★★★★★ 545

20^{50}

Quilton 3 Ply Double Length Toilet Tissue (36...
★★★★★ 300

21^{99} ~~$23.99~~

Curash Water Baby Wipes, 6 packs of 80 wipes (48...
★★★★½ 310

45^{00} ~~$79.95~~

Tommee Tippee Twist and Click Advanced...
★★★★½ 604

From **Amazon.com**: Which menus use exact or ambiguous schemes?

No single "best" organisation scheme

Different scenarios and task will suit different types of organisation schemes. As a designer you must think like a first-time user with goals in mind.

- **Exact organisation** when...
  - A user has an understanding of the defined categories.
  - A user already knows the labels of things they want to find.
  - **Alphabetical, chronological, geographical...**

- **Ambiguous organisation** when...
  - A user doesn't know what they are looking for and wants to explore.
  - A user doesn't know the exact label but will recognise it when they see it.
  - ***When the designer has a good understanding user mental models.***

Organisation structures

Organisation structures define relationships between information. These structures can be conceptual groupings, but usually manifest as navigation routes.

Flat/Sequential
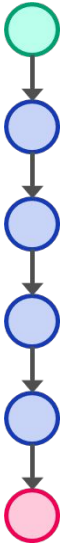
Hierarchical
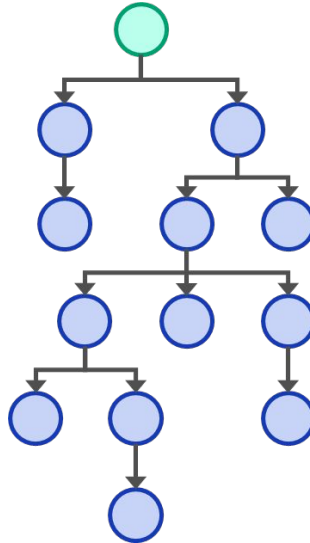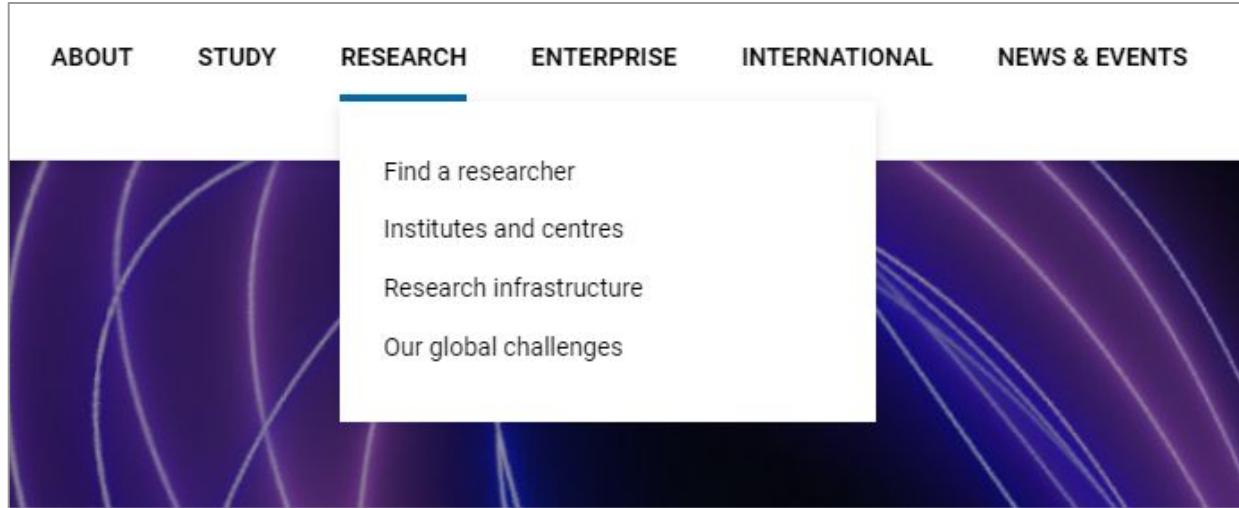
Matrix/Network
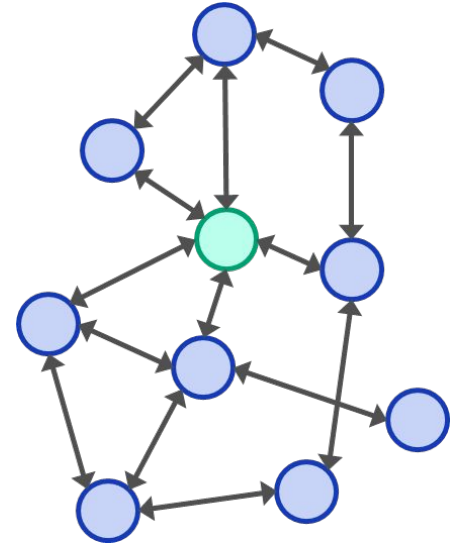
Applying conceptual groupings

Logical and meaningful grouping and sequencing of content allows users to mentally plan navigation.

Understand taxonomy of your content:

- Items of information
- Types and groups
- User mental models and terminology
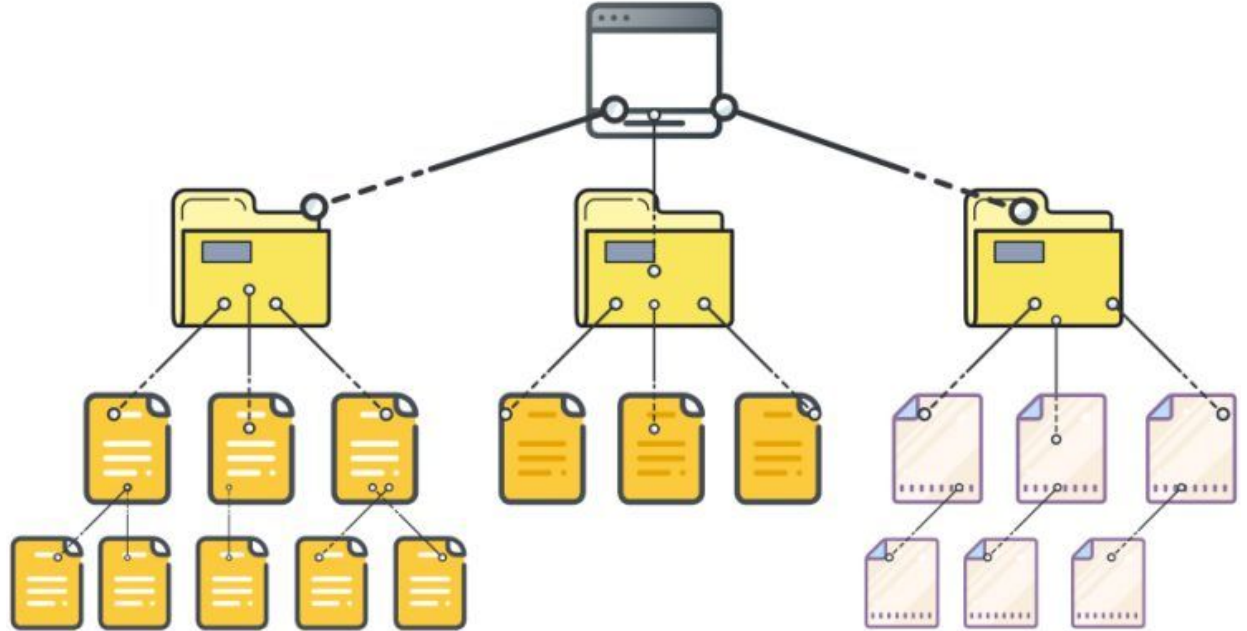
Organisation structures implemented as navigation

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Information architecture

From Wikipedia, the free encyclopedia

Information architecture (IA) is the structural design of shared information environments; the art and science of organizing and labelling websites, intranets, online communities and software to support usability and findability; and an emerging community of practice focused on bringing principles of design, architecture and information science to the digital landscape.[1] Typically, it involves a model or concept of information that is used and applied to activities which require explicit details of complex information systems. These activities include library systems and database development.

Today there is a growing network of active IA specialists who constitute the Information Architecture Institute.[2]

Can you identify the following relationships?

- Flat/sequential
- Hierarchical
- Network/matrix

Labelling systems

Labels provide representation of information chunks that a user needs to access:

- Locate within the system (navigation, headings)
- Provide to the system (form fields, interactions)

Well-designed and well-implemented labels minimise cognitive processing.

Faculty Skunkworks Office for Instructional Technology K12 PDN Projects Web Page Digital Libraries Project Office of Technology Management Extension Services The New Media Center Project 1999 Institute for Information Technology English Composition Board Technology Dissemination Office	Arts & Humanities Business & Employment Communication Computers & Information Technology Education Engineering Environment Government & Law Health & Medicine Places & Peoples Recreation Science & Mathematics Social Sciences & Social Issues

Right: *Unplanned and planned labeling systems.*

Which one is easier for users to understand?

Label types

Labels come in many forms:

- Page titles and section subheadings
- Navigation link text and icons
- Input field labels and exemplar placeholders

Users will make use of labels to decide if content is worth their time.

A clear label help the user understand:

- Where they are
- What options are available
- What action to perform

Labels must be accurate... but also useful

Textual labeling systems

Textual labels are the easiest to create, yet Web Interfaces are full of poorly designed labels.

- Describe destinations accurately but concisely
- Use familiar language and avoid jargon
- Consider the context and provide clues
- Consider providing multiple representations
- Give a "call to action"

Ideally, a label should be able communicate its purpose on its own.

If you would learn more about this topic, **click here**.

Click here to learn more about buying a cat.

Learn about buying a cat.

Iconic labeling systems

"A picture is worth a thousand words" **... but which thousand?**

Icons can represent information in a compact and visually appealing way.

	Meaning: Geographic view of the company	**Interpretations:** World, global view, planet, the world, Earth.
	Meaning: Benefits.	**Interpretations:** Health, money, health care, Clinton's health plan
	Meaning: Public relations	**Interpretations:** TV set, video, TV, TV
	Meaning: Product catalog.	**Interpretations:** System oriented, disk, CD, Computer, CD-ROM
	Meaning: Specialized tools	**Interpretations:** Briefcase, personal info, briefcase, toolbox
	Meaning: What's new	**Interpretations:** Bulletin board, bulletin board, bulletin board, laundry
	Meaning: World Wide Web.	**Interpretations:** World network, map, location, dimensions of the planet

Left: A 1994 user study performed by Jakob Nielsen for Sun Microsystems.

These icons were intended for use in a company intranet interface.

4 test users provided many different (and sometimes very odd) interpretations

https://www.nngroup.com/articles/1994-design-sunweb-sun-microsystems-intranet/

Consider the design of forms

From the **user's perspective** - filling in a form requires a range of cognitive skills

- What information can I perceive?
- What is the question being asked?
- What information is required to answer the question?
- How do I to enter the data? Where and in what format?

"If you understand people, you design better forms."

- Jarrett and Gaffney, **Forms that Work: Designing Web Forms for Usability**

Forms are conversations with users that are communicated through label design.

Labelling examples
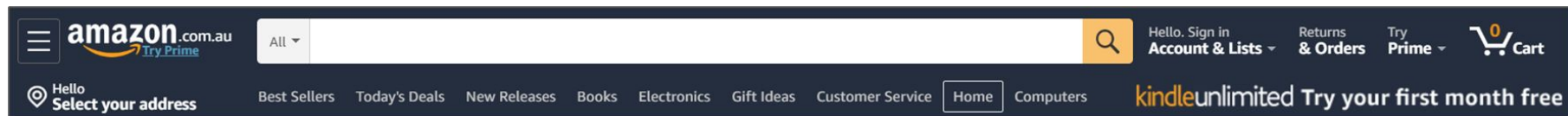
Top: Amazon.com.au

- Clear succinct label text
- Several "call-to-action" links
- "Home" link may be confusing in this context

Left: Payment form

- Clear field and option labels
- Exemplar placeholders for expiry and CVC
- Iconic labelling for quick recognition

Navigation systems

Navigation makes use of labels, textual and iconic, to provide a representation of and facilitate movement through information organisation.

Well-designed navigation systems are tools to prevent people from getting lost.

Concepts from Lecture 4's "navigation menus" are also information architecture.

Reminder: Navigation is...
- Movement between different screens or pages of information
- Movement between UI elements within a single screen
- Direct movement between different systems, such as websites

Homepages and homescreens as navigation systems

The homepage or home screen is a user's first-impression of your system.

Users arrive with different goals

- Present a navigation gateway
- Provide useful options to support common goals.
- Capture the high-level concept of the system's purpose.
- Guide the user while supporting their own sense of agency.

Avoid "mystery-meat" navigation
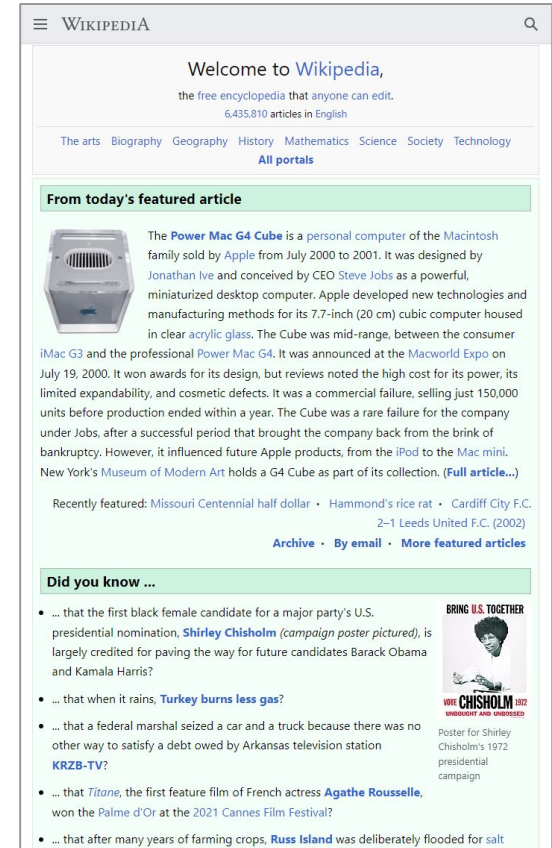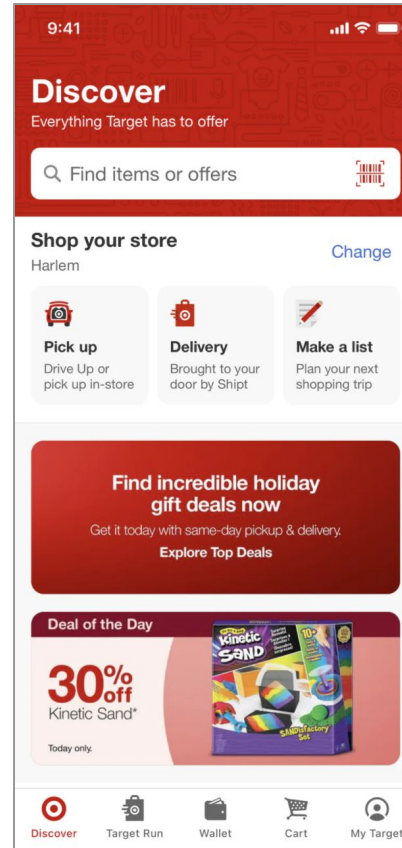
Search systems
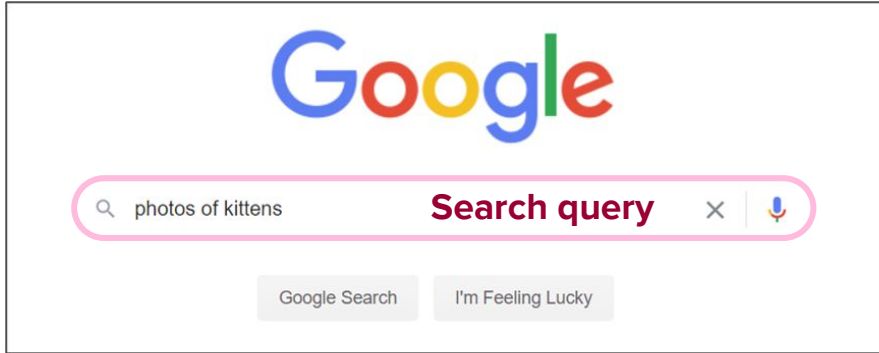
Search should not be a replacement for good labelling and navigation.

Search can be a great supplemental shortcut if implemented properly:
- Designing search methods
  - Search complexity vs. potential accuracy/inaccuracy
  - Search context (e.g. search entire site or only products?)
- Designing search results
  - Result order and filter controls
  - Highlighting of search terms
  - Term corrections, pagination, etc.
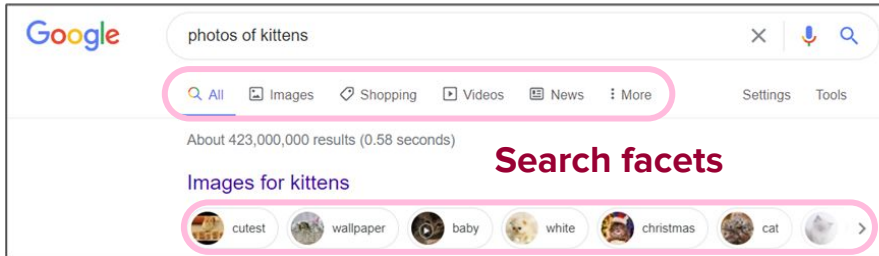
Search systems

Exact search

Search query

Faceted search

Search facets

Parametric search

Search parameters

Search context

Different users and contexts will have different search needs. A well-designed search considers what is relevant to show in results and if further search tools are needed.
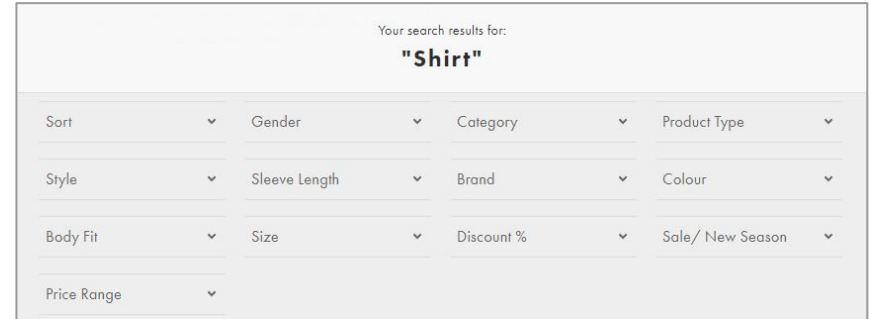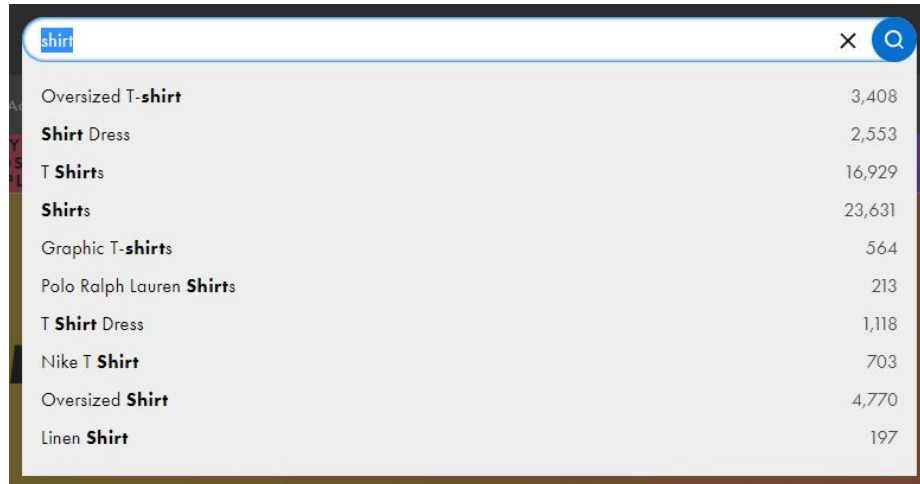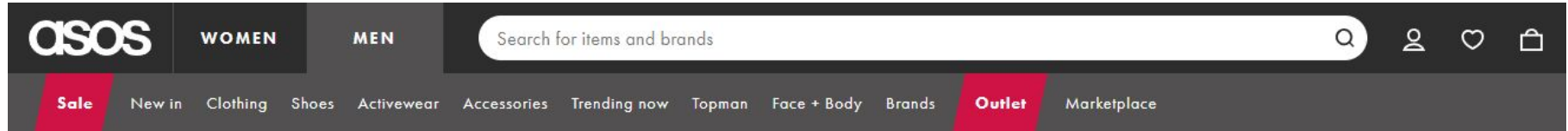
*ASOS.com provides an exact search, suggestions and history, as well as results with facets/filters to refine context.*
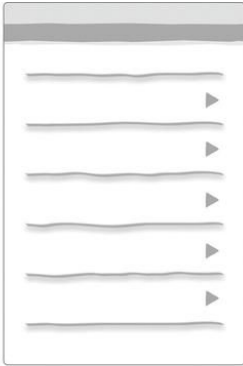
Menu Types and Design Guidelines

Recap: Menus in GUIs

Any structured collection of options that a user can select from is a menu.

These are common design patterns for navigation - they are not just based on layout.

- **Dashboard menus** focus on providing overviews of data
- **Metaphor menus** base their visual appearance on the conceptual model.
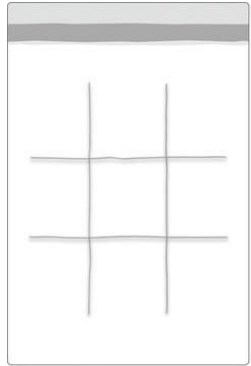
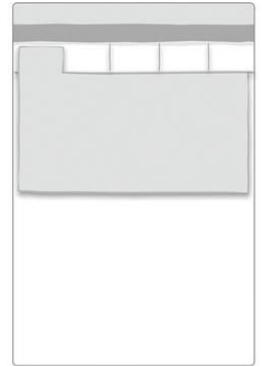Springboard   List Menu   Tab Menu   Gallery   Dashboard   Metaphor   Mega Menu
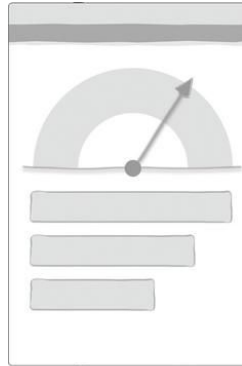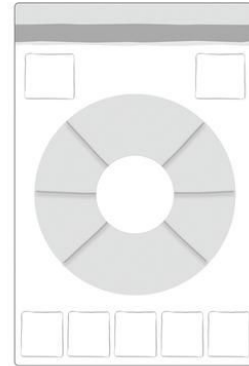
Drop-down menus and ribbons

Menu bar

- Items displayed in one bar
- Textual or iconic

Drop-down menus

- Usually accessible from a menu bar
- May include cascading

Ribbons

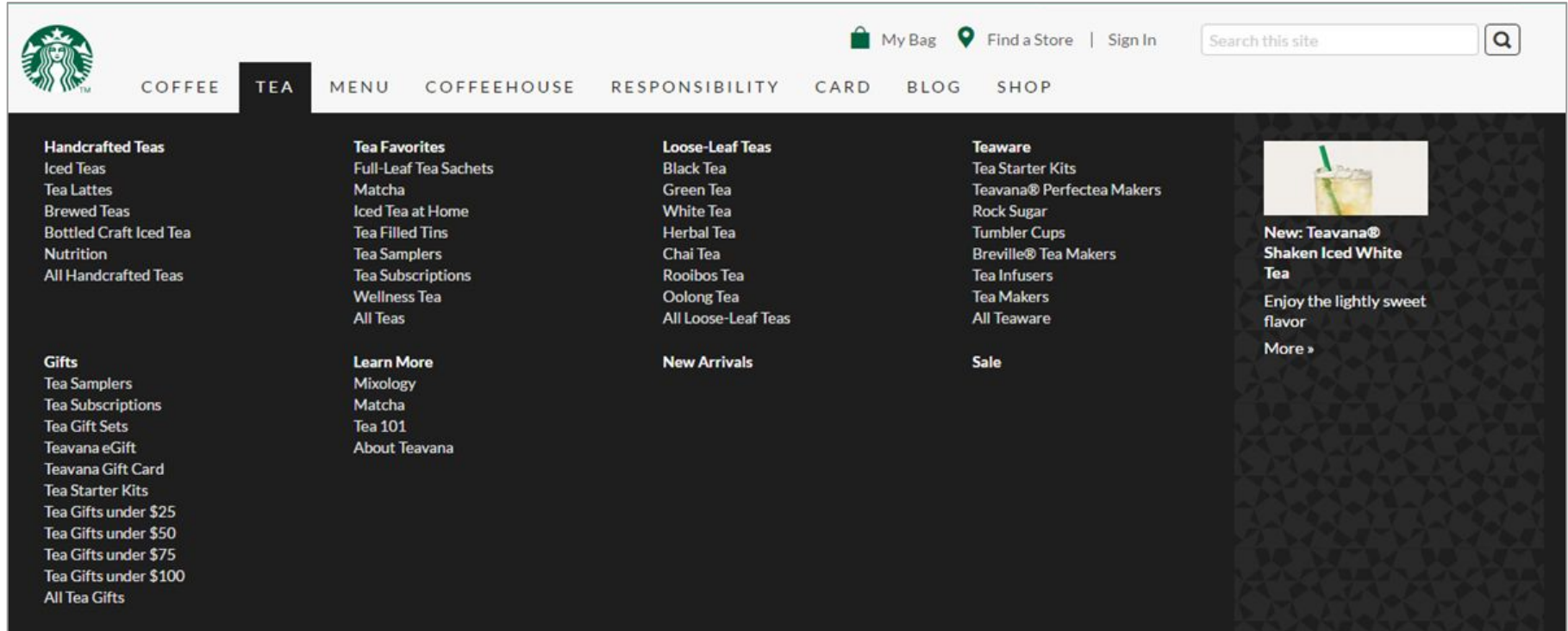- Task-based grouping of menu bars.
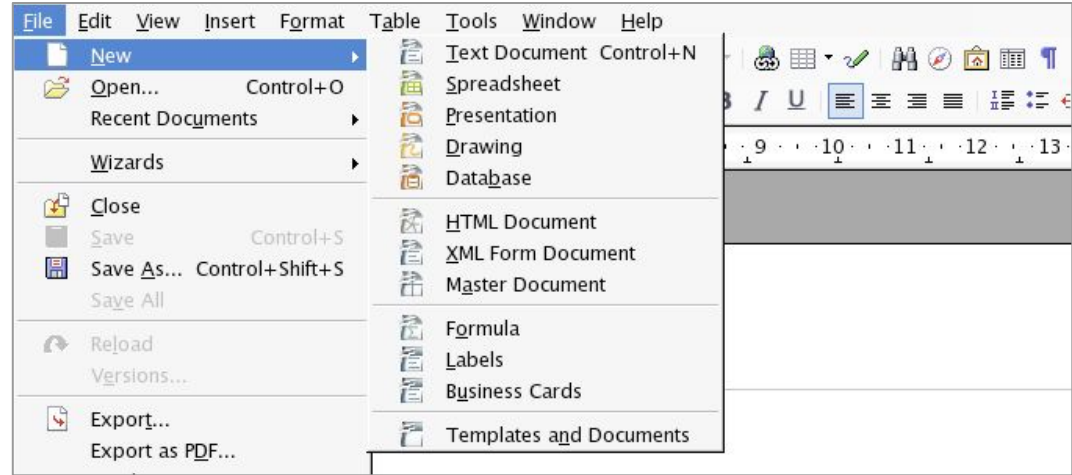
Cascading hierarchical menus

Cascading menus allow more functions to be offered on one single top-level menu item

- Use of a signifier to indicate hidden hierarchy level.
- Less visibility of available options
  - Difficult to remember where items are located
  - Requires careful planning of organisation scheme and structures
- Requires precise mouse movements
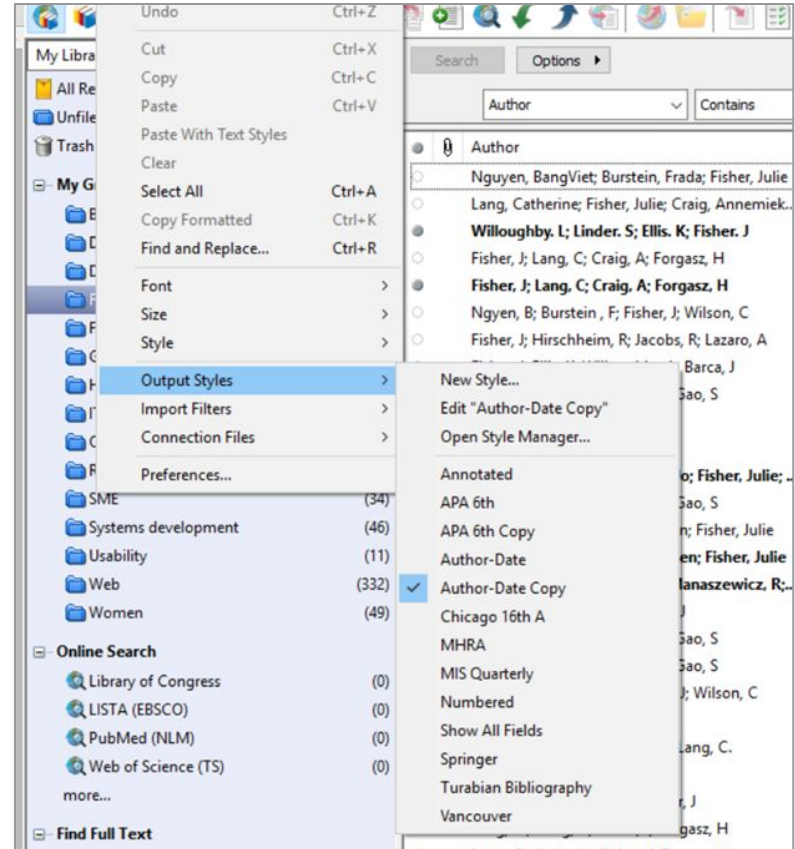
Mega-menus

Useful when a large number of categorised options have relatively equal importance.

Mega-menus

They improve visibility
- They provide users with a wider view and a big picture of the available options
- They show all the lower level options within the hierarchy

When designed well, they reduce memory load
- The use of category labels and white space to separate groups.
- Implement categories that are familiar to the user.
- Users can easily compare the items at a glance.

**They generally improve efficiency**
- Less effort to operate compared to nested hierarchical menus.
- Less time browsing within menus to make options visible.

Hick-Hyman Law (Hick's Law)

How could the number and complexity of menu options affect menu performance?

Research by psychologists William Edmund Hick and Ray Hyman, describes logarithmic increase in reaction time as the number of possible choices increases.

Right: Data from two participants charting reaction time (RT) vs. number of choices. Participant #1 was asked to perform the task accurately, while the other was asked to perform the task quickly.

$0.626 \log_{10}(n+1)$

$0.518 \log_{10}(n+1)$

RT (s)

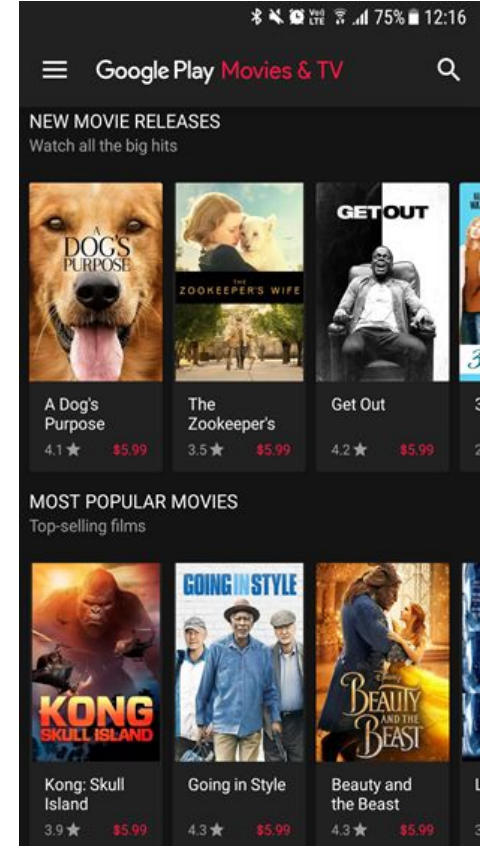Degree of choice
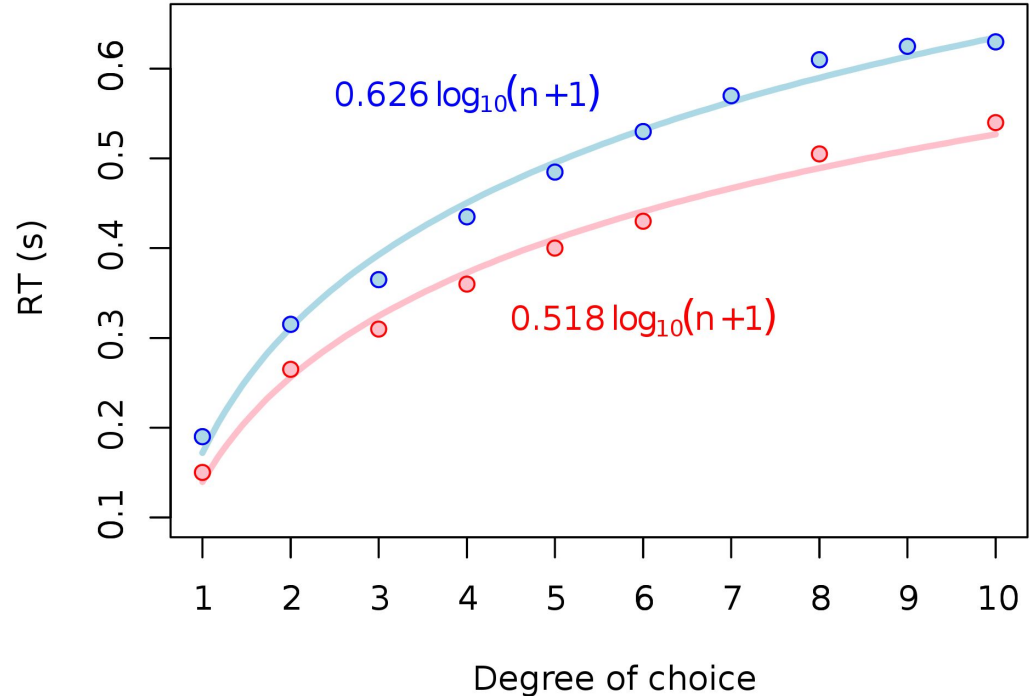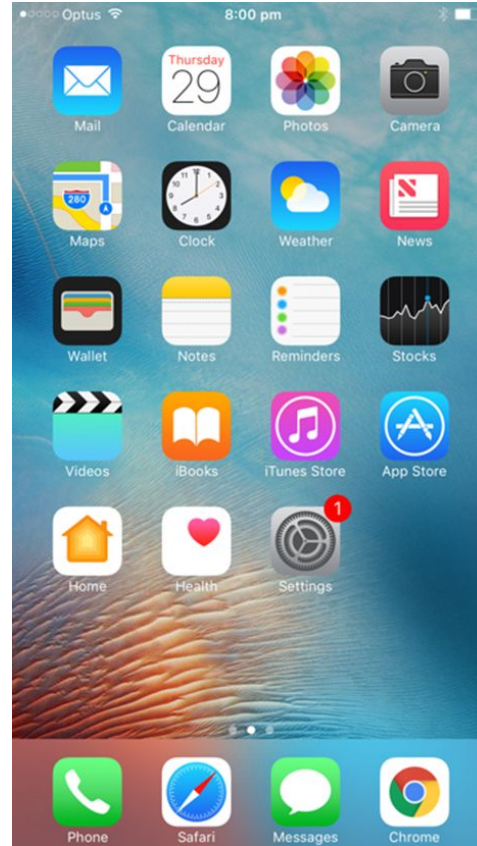
Springboards, tiles and galleries

Mobile interfaces in particular need to make economical use of space.

A **springboard** provides a high-level overview of menu items in a 2D grid.
- Good for options with a similar level of importance.

Galleries are menus with dynamic tiles of content.
- 1 or 2-dimensional

Tabs and navigation bars

Fixed tabs display all the options in fixed positions - greatly limited by screen width.
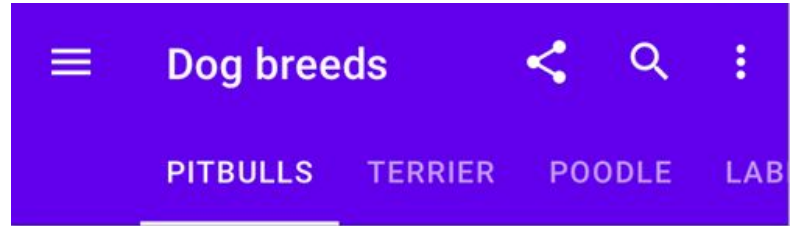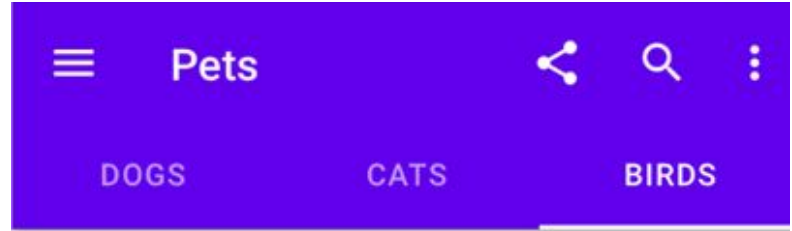- If the number of options are limited (3-5)
- If the tab items are equally important

Scrollable tabs shows a subset of options
- Limit the number of categories to 5-7 tabs to reduce navigational effort.

Bottom navigation bars
- As primary navigation for top-level items.
- As utility navigation for frequent actions.

Summary of menu design guidelines

- Choose menu types that are effortless and natural to find and use
- Don't suddenly change the navigation type or organisation
- Limit the use of deep cascading menus
  - Place frequently used functions at higher levels.
  - Group options in logical ways
- Reduce errors through disabling/greying out inapplicable menu items
- With mega menus
  - Broad-shallow menus are preferred to narrow-deep ones
  - Create categories where options options have similar importance
    - Hierarchical categorisation
    - Associative categorisation

Icon Design Guidelines

Icons and graphics in navigation

Icons are a widely used mechanism for navigation.

As a primary or only label
- Communicates in a compact form-factor
- Adds personality to a design
- Can be misinterpreted

As support for a textual label
- Provides quick visual identification
- Builds strong mental models through association

Well-implemented icons promote **recognition over recall** to reduce cognitive processing requirements.
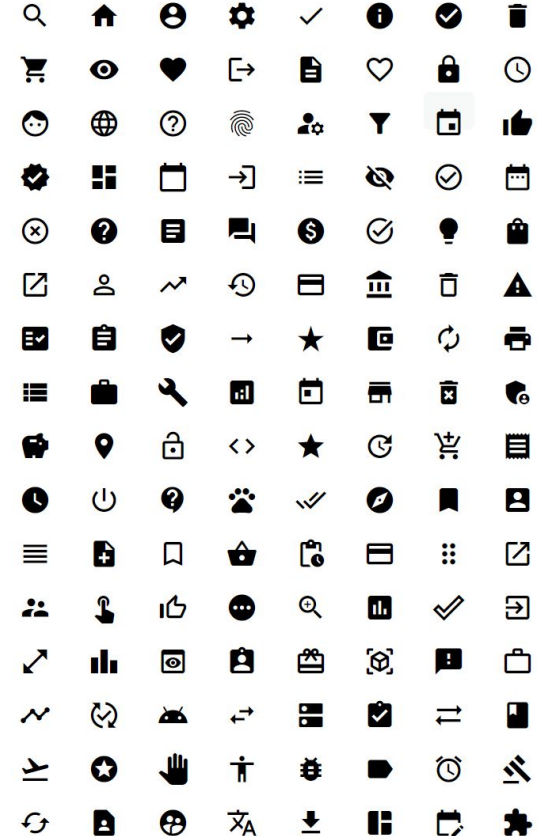
Classification of icons

Resemblance icons

A graphical depiction of the object it intends to represent.

Exemplar icons

Depiction of a concept using an example from that class.

Symbolic icons

A metaphorical depiction using a reference or analogy.

Arbitrary icons

Have learned meanings, often relying on knowledge of conventions.

A good icon should have

Clarity in the meaning that it communicates to users.

Readability when its details are presented at small sizes.

Recognisability compared with other icons in the interface

Balance in how its sub-elements are aligned in space.

Consistency in design style and in the meaning it conveys.

Personality that communicates the values product or brand.

Skeuomorphism and metaphors in icon design

Recall lecture 4: Skeuomorphic interfaces use GUI elements whose visual design mimic their real-world counterparts.

Skeuomorph ← ——————————————— → Metaphor

- Skeuomorphs depict real-world details that are identifiable, but also very specific.
- Metaphors abstract the design to hint at the concept of the meaning.

Representing similar concepts
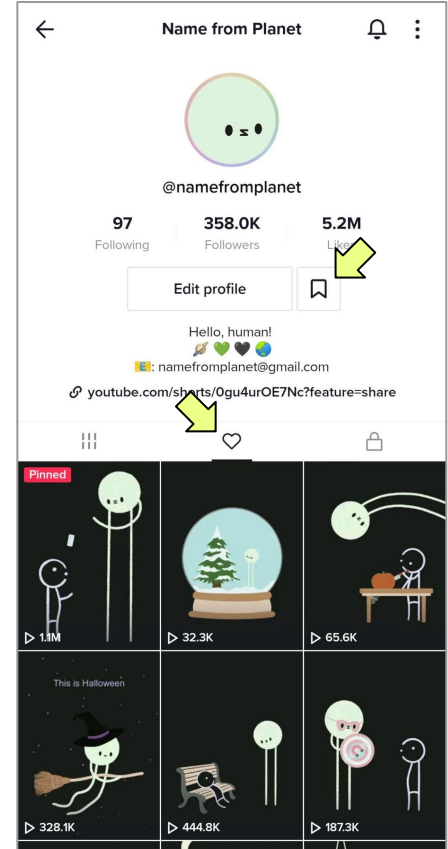
Vastly different icons can represent similar concepts.

Avoid using multiple icons within a single interface that have overlapping meanings.

When icons with similar meanings are used together:

- Users may accidentally choose the wrong action.
- Users might not notice an important action.

Right: TikTok has "like" and "favourites" - many users are only aware of "likes".

Differences in conceptual representation

Some ideas - particularly abstract concepts **without inherent visual appearance** are difficult to design.

- *Which icon is most successful design for your understanding? Why?*
- *How is the concept of the action portrayed in each icon design?*

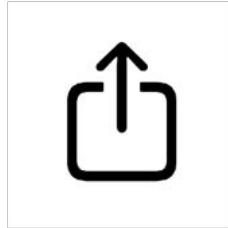In most cases, platform consistency aids familiarity.
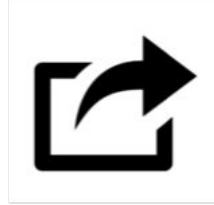
Apple
(prior to iOS 7)

Youtube
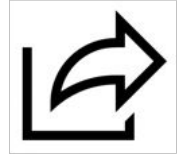
Windows
(since 2017)

Apple
(since iOS 7)

Windows
(prior to 2017)

Android

Abstraction of meaning

A user's understanding of icons may come from:

- Knowledge of the real world
- Knowledge of concepts
- Knowledge that is purely learned

As real-world experiences change, standard and conventional visual depictions may become less meaningful:

- Icons based on resemblance become metaphorical.
- Icons based on metaphor become symbolic.
- Icons based on symbolism become more arbitrary.

Designing for scale and flexibility

Icons are part of a platform or application's design system. They may need to be used in different ways.

- Attractive appearance at large sizes
- Legible at small sizes
    - Maintain consistent line weight
    - Add or remove design details
    - Recognisable shape and proportion
    - Details fit to a pixel grid.

Right-top: Windows icons manually refined for size and colour depth.
Right-bottom: Apple size requirements for application icons.

Device or context	Icon size
iPhone	60x60 pt (180x180 px @3x)
	60x60 pt (120x120 px @2x)
iPad Pro	83.5x83.5 pt (167x167 px @2x)
iPad, iPad mini	76x76 pt (152x152 px @2x)
App Store	1024x1024 pt (1024x1024 px @1x)

Maintaining consistent visual style of icons

Assignment Stage C + D

Stage C - Scenario and Acceptance Criteria

Select one of your Stage B user stories and develop a user scenario for it using the following template.

Write a short paragraph explaining the decisions made when creating the scenario

Identify 3 specific acceptance criteria that need to be implemented for your mobile app to be successful.

You may make minor updates to the user story provided you justify the changes.

Actor	
Motivator	
Intention	
Action	
Resolution	
Acceptance Criteria 1. ... 2. ... 3. ...	

Stage C - Journey Map

Create a journey map that depicts the persona's experience in your previously defined scenario.

The journey map must include:
- At least **5 phases** in the journey.
- Lanes containing **user thoughts, actions and feelings**.
- Identification of **insights and opportunities in at least 3 phases**.

The New Patient's Journey

Opportunities to impact the experience at ABC Health

Newbie Natalie

Age	34
Background	This is Natalie's first time for an MRI, so she's a bit anxious about it.
Insight	Natalie's doctor's office printed out some WebMD pages about MRIs to help her understand what to expect.

Expe

Health

Pre-Appointment | **Drive & Arrive**

Select Provider | Schedule/Pre-reg | Drive & Park | Check-in/Reg | Wa

Touchpoint / Interaction

Natalie receives the prescription from her doctor, who tells her to schedule it soon.

Natalie can't find a place to park, and isn't sure about the valet. After driving around the lot for a while she finds an open spot.

As Natalie appointme the front d

The registration desk is nice, and tells her where to find radiology.

Natalie first gets a list from her insurance provider, then googles the locations on the list. ABC has 4 stars, so she calls there and a few other places. ABC calls her back very quickly, so she schedules there.

Thoughts

"My doctor didn't help me find a place at all. They just gave me a script."

"It seemed strange to me that only one hospital called me back. But they seemed really nice on the phone, and they were close to my home."

"I've never been here before. Which entrance do I use?"

"This place is in the basement?"

"Wow, ho unprofes make the coming h

Stage D - Low-fidelity Prototype Exploration

Each group member must sketch 2 low-fidelity screen prototypes showing different ways the acceptance criteria they defined in Stage C could be implemented. Each sketch will be a hand-drawn wireframe of a different interface concept.

In each screen, clearly label and annotate where your acceptance criteria have been implemented.

If necessary, updates can be made to the previously defined acceptance criteria. Any changes to the acceptance criteria must be supported by an appropriate written justification. Any justifications should be short and concise - a single sentence.

Stage D - Low-fidelity Application Prototype

As a group, create a low-fidelity multi-screen application prototype that implements ideas from each group member into a single application design.

Provide a clear title for each screen that states what its purpose is.

The prototype does not need to implement all screens of the application. The number of screens submitted is determined by the number of group members.

Each group member will contribute 2 screens in the prototype. The screens can be:
- Primary screens that depict implementation of acceptance criteria.
- Secondary screens that provide navigation between primary screens.
- Additional screens that show major/minor application functionality.

Stage D - Theory-Based Justifications

For each screen, in the application prototype, provide an explanation of how one of **Norman's 7 Principles of Interaction Design** or **Shneiderman's 8 Golden Rules** has been applied in the design.

Each screen should have 1 annotation only and each annotation must apply a different principle or rule.

Event Detail Screen

Theory: Norman's Principle of Constraints

Next session

- Visual Design: Principles and Styles
- Gestalt Principles and Design Critique

Reminders

- **Discussion Forum 1 is due at the end of this week**
  - Post your submission containing an original photo and explanation.
  - Make sure you follow all posting rules.
- **Stage C is due on Tuesday next week**
  - Define 1 scenario and 3 acceptance criteria
  - Create a journey map
- **P3 replacement classes next week (Australia Day university holiday)**
  - Wed 26 Jan classes replaced with Thu/Fri classes