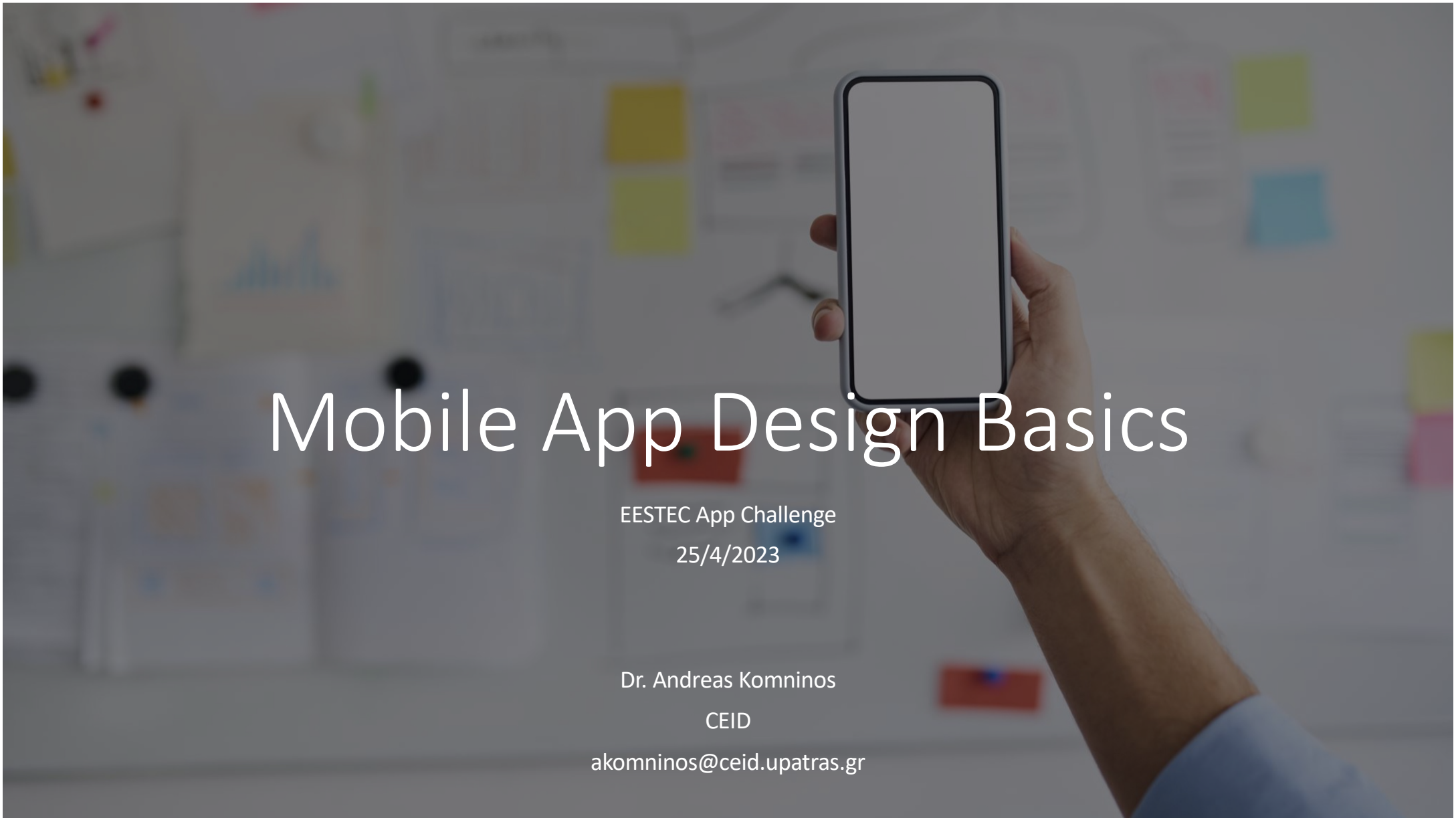

Mobile App Design Basics

EESTEC App Challenge

25/4/2023

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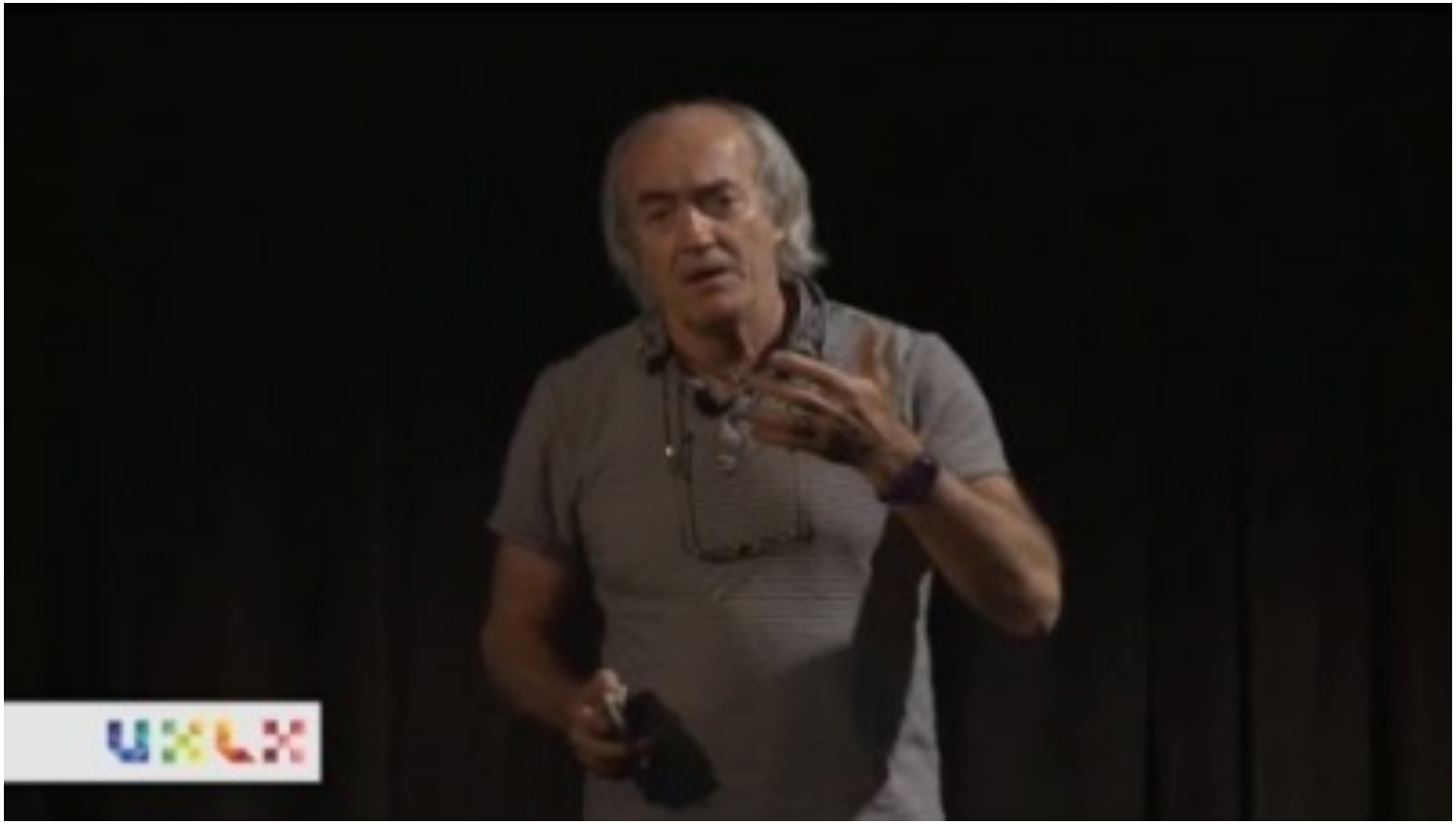
The question is…



https://youtu.be/bSLhQA2OQB4?t=1714

Bill Buxton, 2015

Now that we can do anything…

- What should we do?
- How should it work?

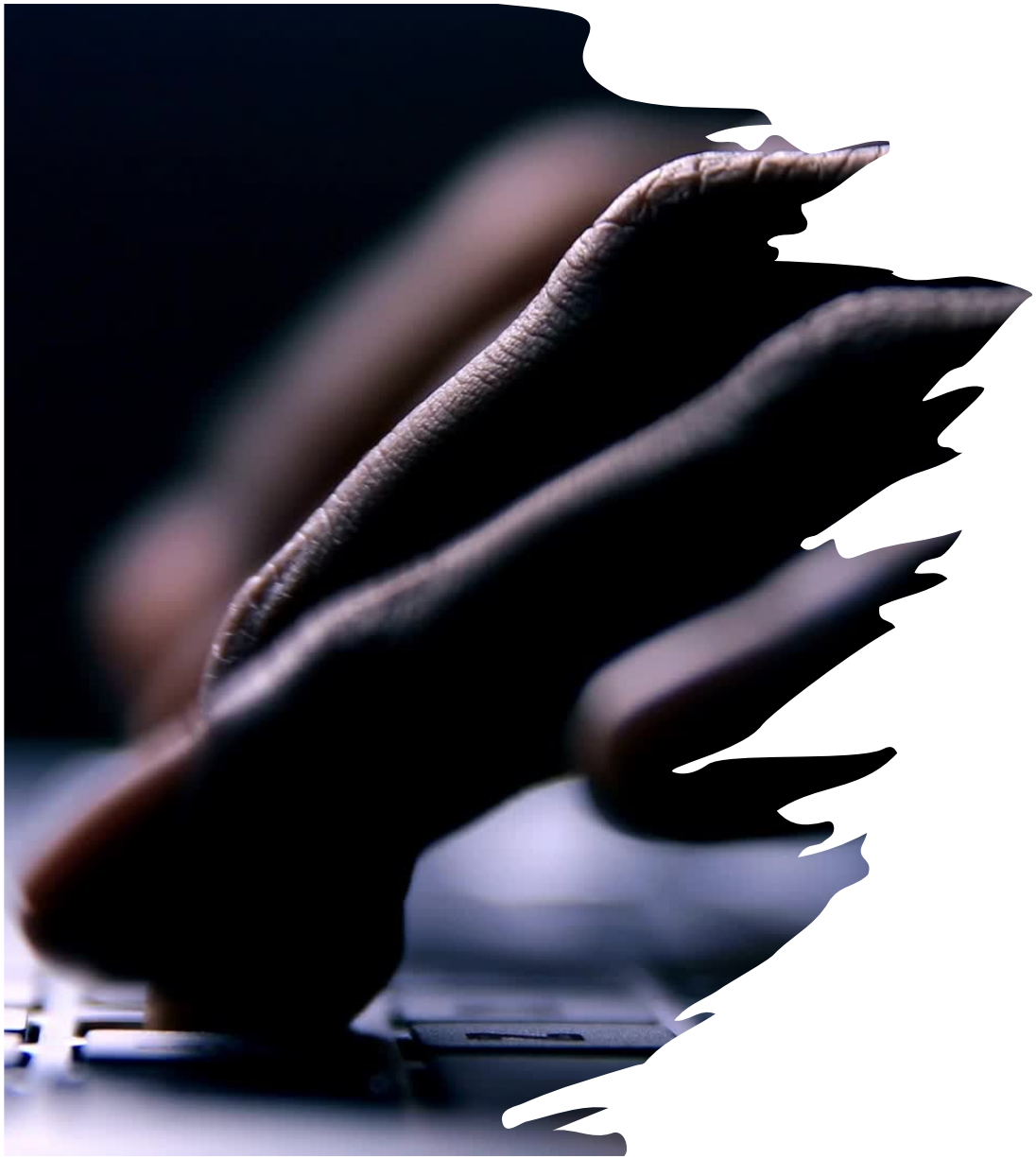
Introduction

- The motivation for interaction design is to support use in three ways:
  - **useful**: accomplish a user task that the user requires to be done;
  - **usable**: do the task easily, naturally, safely (without danger of error), etc.;
  - **used**: enrich the user experience by making it attractive, engaging, fun, etc.

- "…The Interface is ***not something that can be plugged in at the last minute***; its design should be developed integrally with the rest of the system. It should not just present a "pretty face"; but should support the tasks that people actually want to do, and forgive the careless mistakes." (Dix et al. 2004)

Useful: Heckel's Law

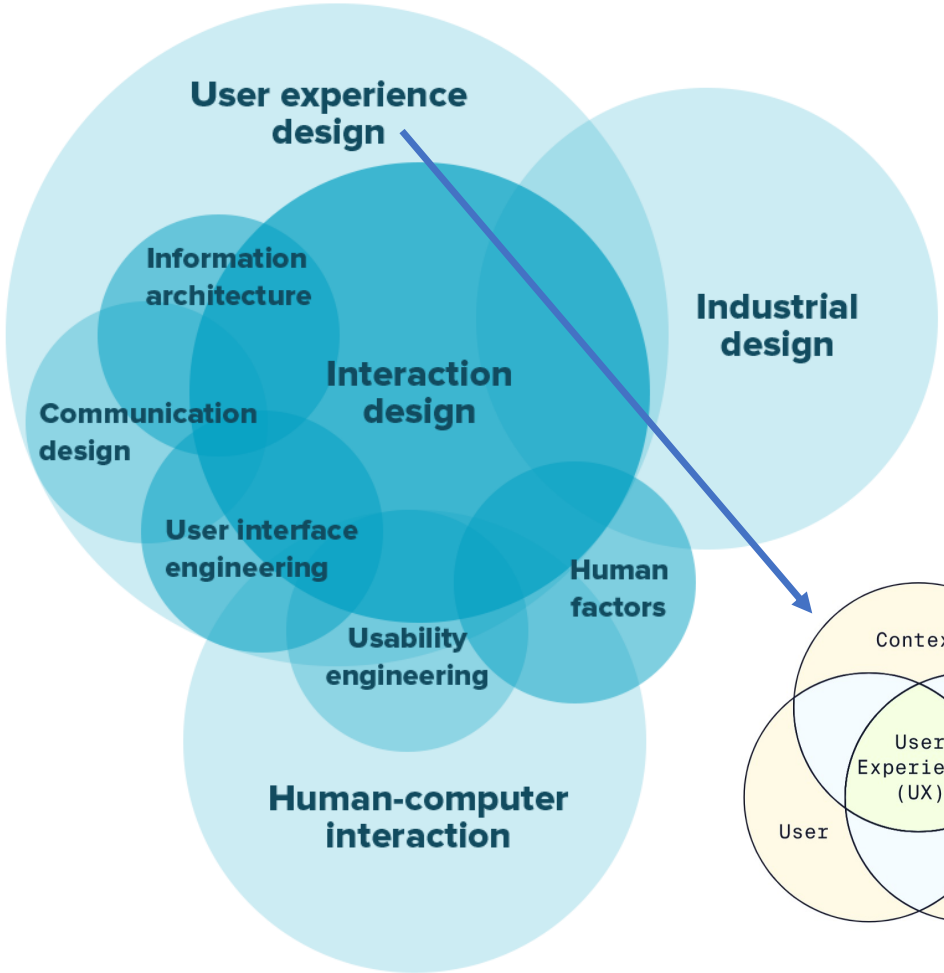
- "The quality of the user interface of an appliance is relatively unimportant in determining its adoption by users if the perceived value of the appliance is high."
    - Although the usability of the UI is important, the overriding concern is the usefulness (value) of the device itself
- Heckel's inverse law
    - "The importance of the user interface design in the adoption of an appliance is inversely proportional to the perceived value of the appliance."
        - That is, if a difficult user interface acts as an inhibitor to the uptake of an appliance, then the appliance probably does not have enough perceived value to be useful.

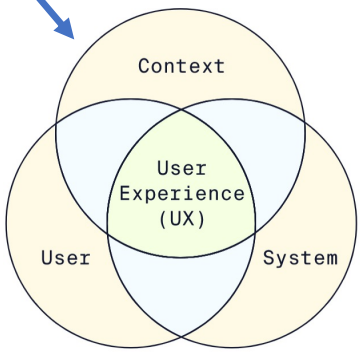


Usable: the human user

- The user's goal is NOT to interact with a computer
- The user wants to ACHIEVE GOALS
- Goals will be *achieved using a computer,* if:
  - it can't be done more efficiently in another way
  - the use of the computer offers a pleasurable experience
- Users will put up with bad experiences **if** the tool is the absolute only way they will achieve their goal
  - ... ***but this is not an excuse for providing bad experiences!***

Enter User Experience (UX)

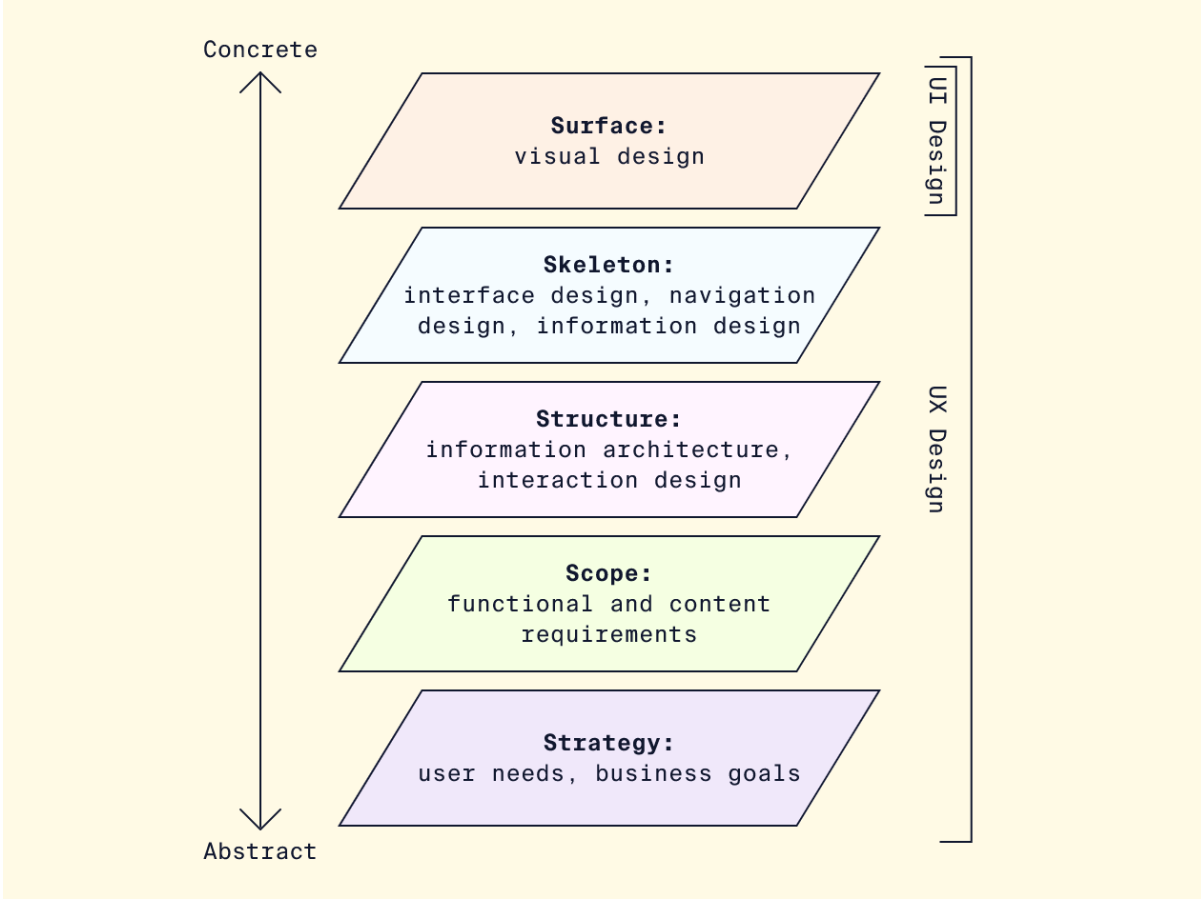




- Design: “to plan and make (something) for a specific use or purpose.”
  - User Interface Design
    - Focused on the *(not only)* visual design of the interface through which users interact with a product or system.

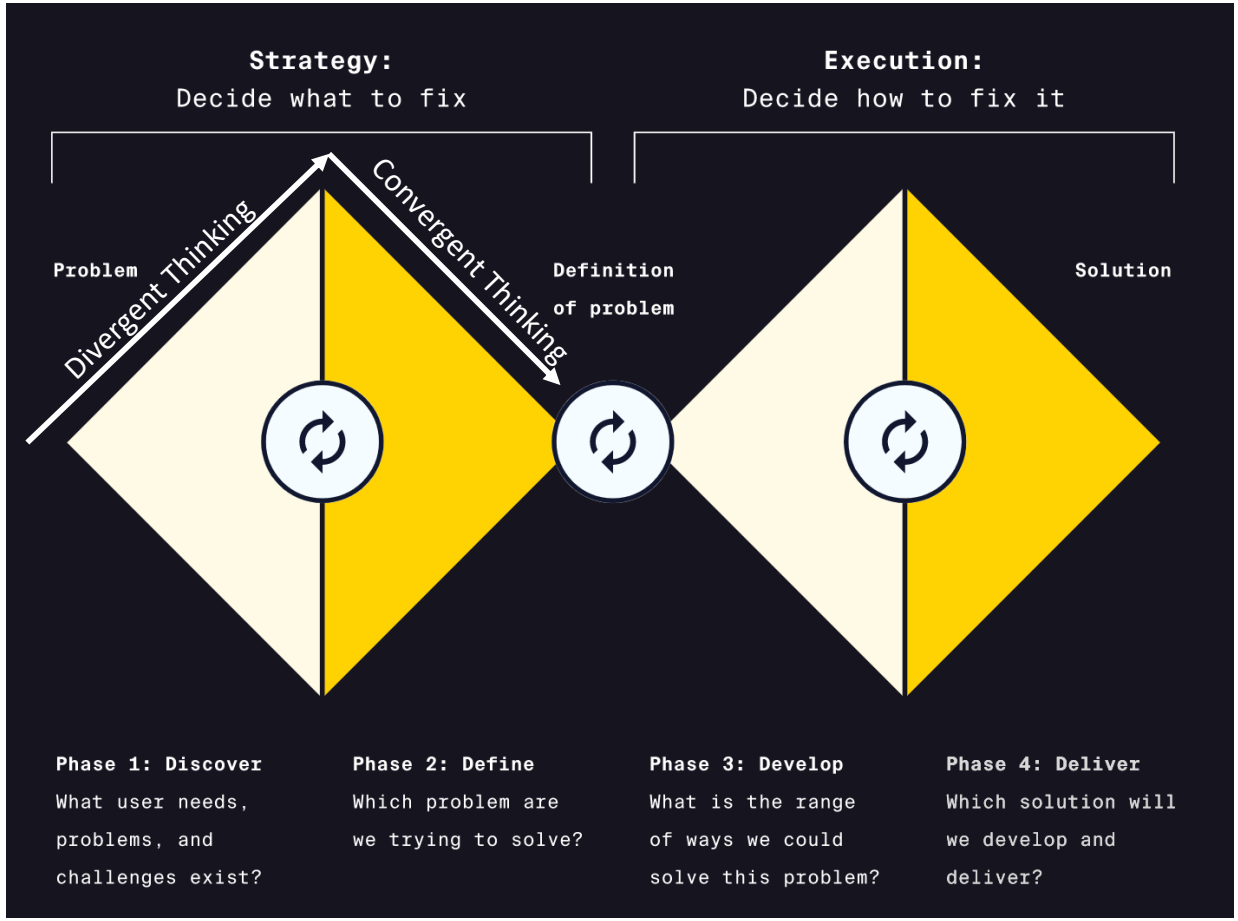
  User Experience Design
    - Focused on the holistic experience around a product or service, taking into consideration the user, system, and context.

User Experience

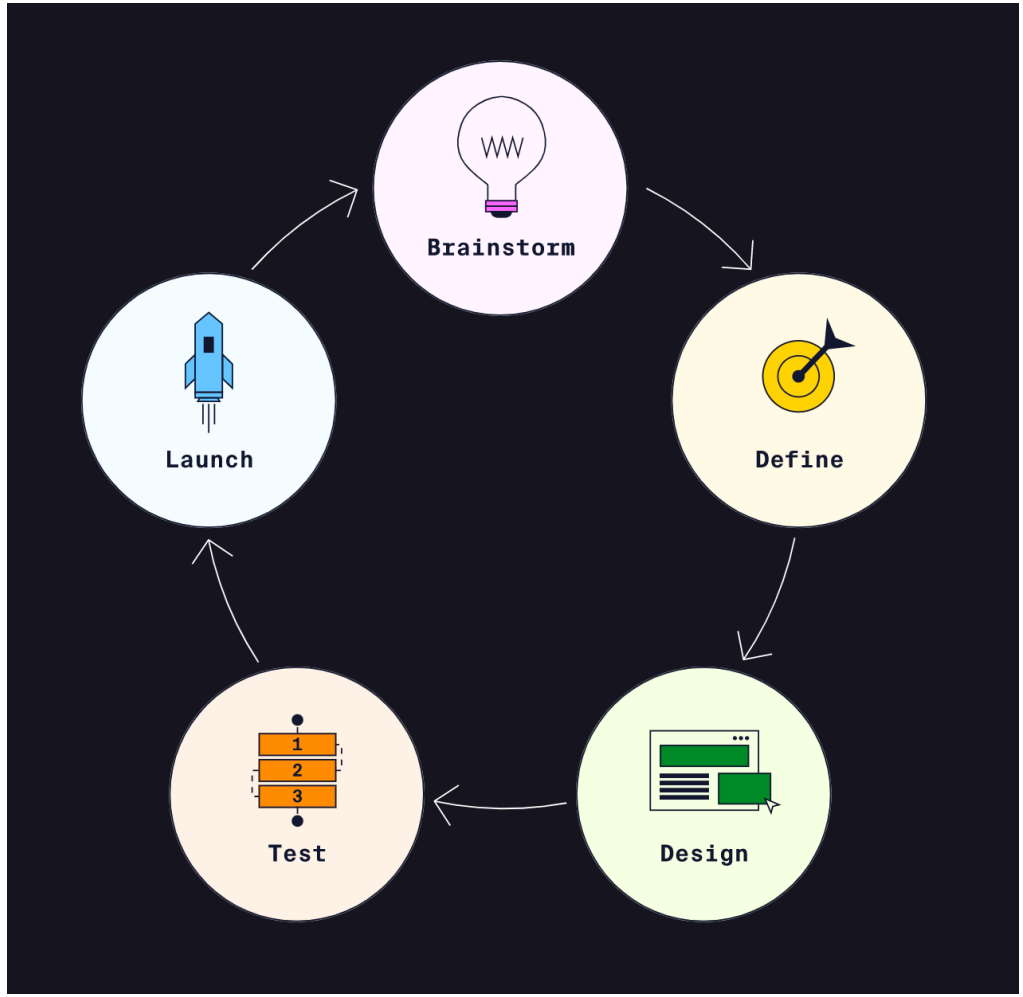


The Double Diamond model

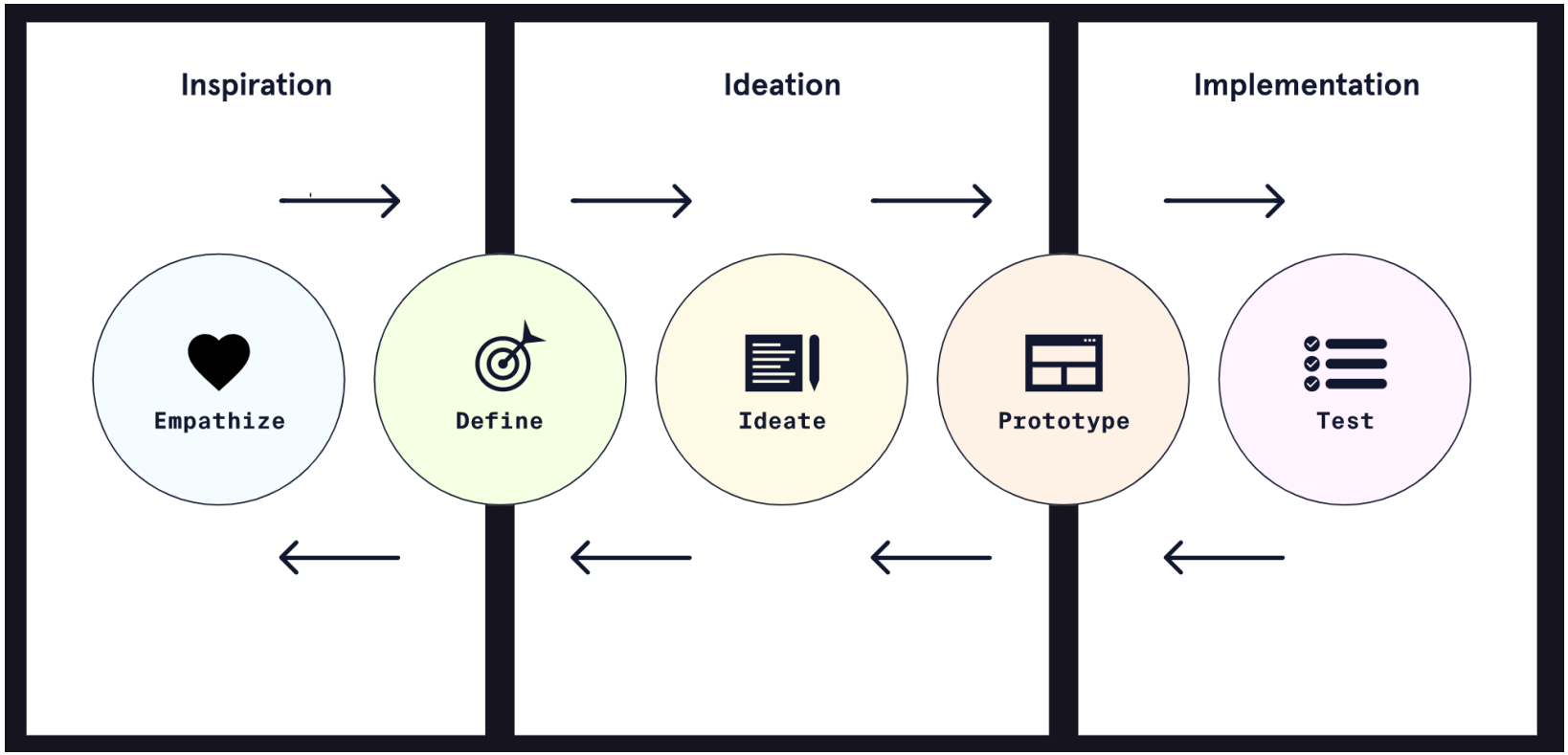
- Divergent thinking
  - explores many possible solutions and generates novel ideas.
- Convergent thinking
  - analyzes, filters, and focuses ideas and leads to decisions.



Product Development Lifecycle

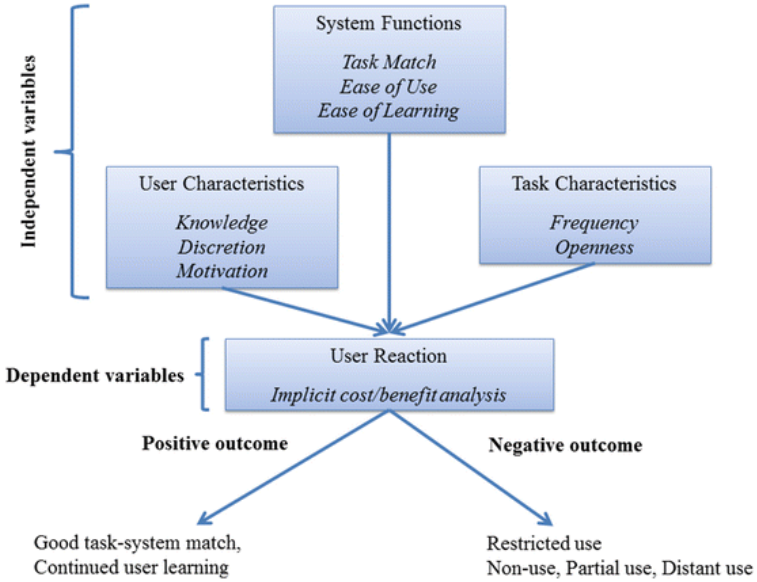


Design Thinking



Good Usability

- Not determined by just one or two constituents, but influenced by a number of factors, which interact with one another, in sometimes complex ways (Booth 1989)
- Usability criteria
  - Learnability
  - Flexibility
  - Robustness
  - Efficiency
  - Memorability
  - Errors (and recovery)
  - Satisfaction



Eason's causal framework of usability (1984)

Good UX

- **Useful**: fulfills a user's needs
- **Usable**: easy to use and understand
- **Desirable**: visually attractive and succinct
- **Findable**: easy to navigate and find information
- **Accessible**: users with disabilities can use the product
- **Credible**: the product, company, and services are trustworthy
- **Valuable**: delivers business value

Peter Morville's UX Honeycomb

User Research

- *User research* is the systematic study of target users of a product or interface to understand their behaviors, needs, and motivations.
  - Can happen at every stage of the design process to inform decisions.
- Quantitative research
  - methods that can measure objectively **(numerically)**, such as surveys, analytics, and A/B testing.
- Qualitative research
  - methods that can measure subjectively, to examine **why** users behave the way they do, such as interviews, focus groups, and ethnography.
- You need BOTH!
  - As part of the discovery process
  - As part of the design process
  - As part of the evaluation process

The Data-Driven Restaurateur

Colleen:

"I want to expand my customer base, and I want to see the data."

Colleen is a restaurant owner of a local chain that has three branches. She sells her food on your platform because it helps her coordinate delivery orders and increases the volume of her business. She uses FastEats because it brings in new customers and makes her life easier. She can expand her delivery business just by hiring more delivery staff without needing extra help to answer the phone and provide customer support. She's price sensitive; if FastEats starts charging a commission of more than 15%, she might set up her own mobile application or switch to a competing app. She wants your application to deliver repeat customers, and in order to assess this, she wants to be able to see and analyze her FastEats sales easily using the business dashboard.

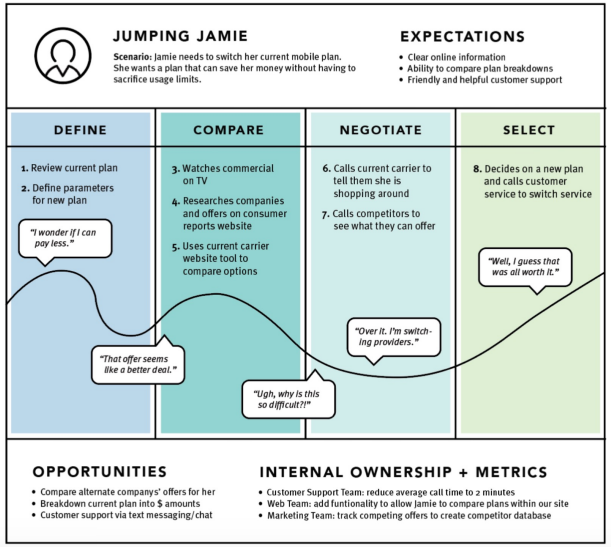
Entrypoint: Colleen's business was identified by the business-to-business sales team.

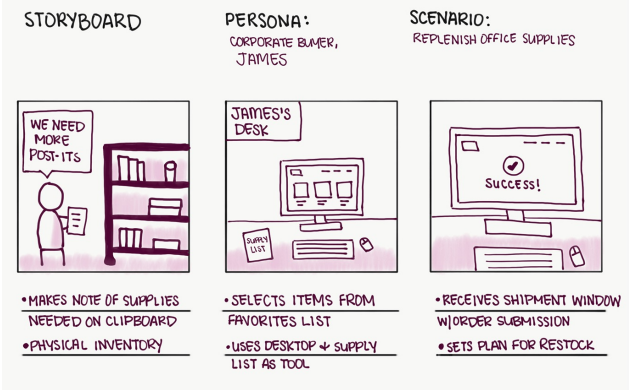
Devices: Her restaurants are set-up with the iPad to receive and manage orders, but she uses the web application to look at the business dashboard as she is reviewing her company's financial statistics.

Goals: To make more money than she would without using the app, with as few additional costs or hassles as possible.

__ Frustrations:__ Colleen is aware that due to the FastEats commission, her margin is lower for purchases made through the app. She wants to track her revenue very carefully to make sure that this continues to be a good investment for her.

CUSTOMER JOURNEY MAP *Example* *(Switching Mobile Plans)*



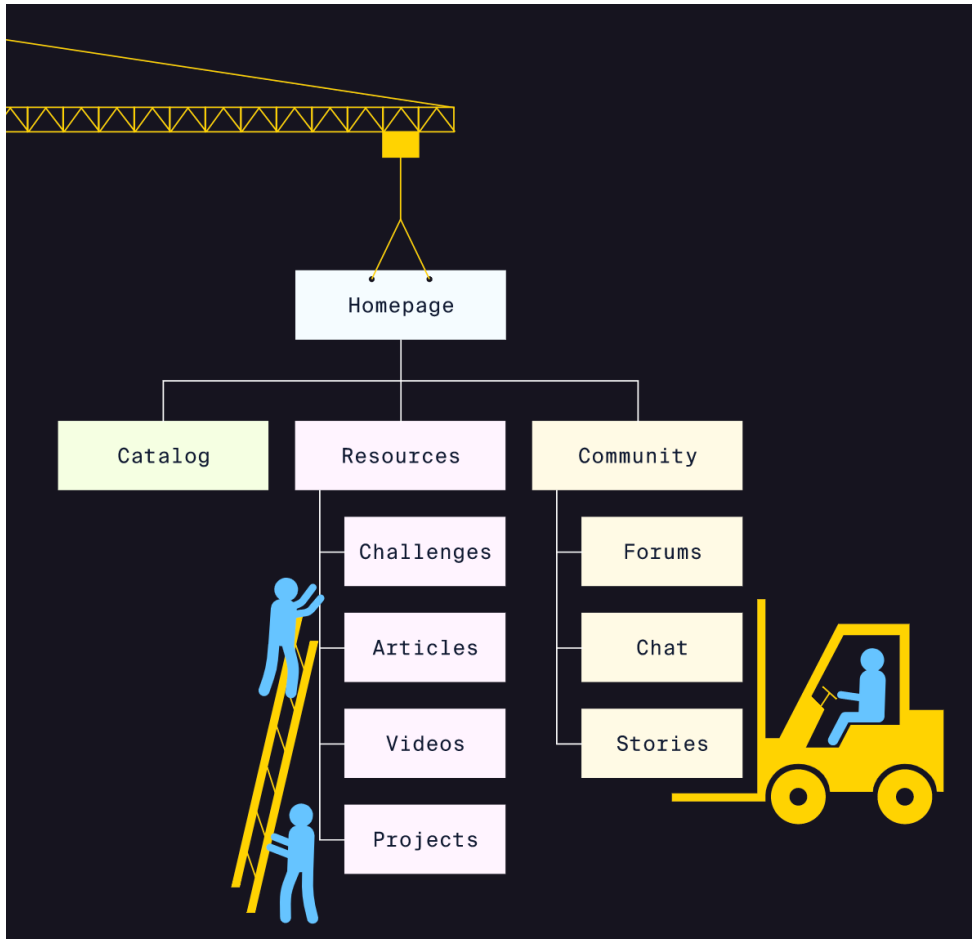


Learn the user

- User Personas
- User Journeys
- Storyboards

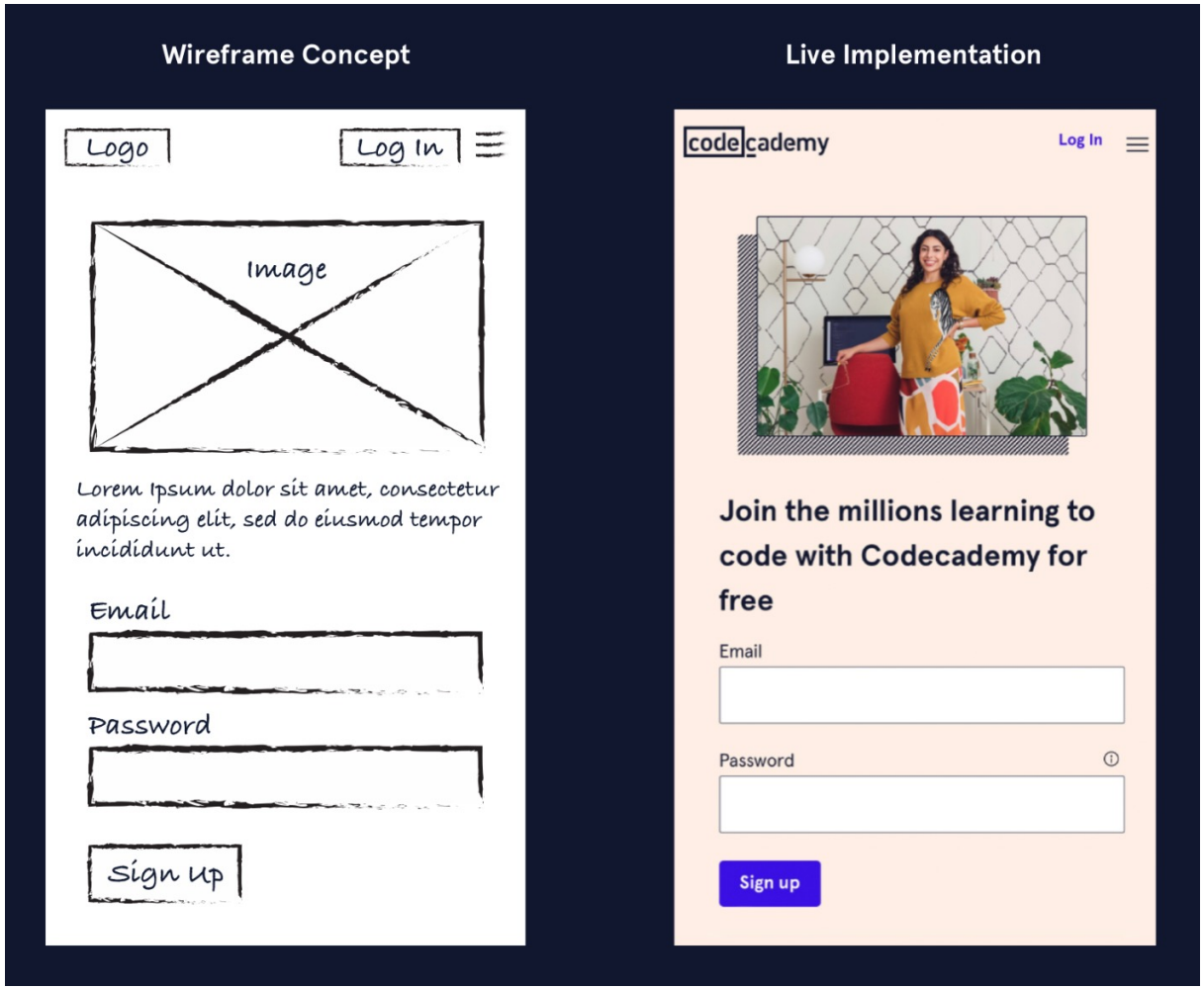
Prototyping

- First, define your information architecture!
- *Information architecture* is the organization, prioritization, and presentation of information within products, websites, and other software applications.
- Effective information architecture is important
  - it allows users to complete tasks with the least effort required.
  - Example: Sitemap
- User workflows
  - Paths taken through the information architecture to complete a task



Prototyping

- Low-fidelity
  - Paper drawings
  - Wireframe mockups
- High-fidelity
  - Computer designed
  - True to scale
  - May contain interactive elements



Some tools

- Paper + Pencil (duh)
- Draw.io (wireframing)
- Freehand (online collaboration)
- Marvel (rapid prototyping + interaction)
- Figma (hi-fi mockups)

https://www.youtube.com/shorts/AJV74Nj6vIc

Mobile interaction design

- Users install your app because **they need to solve a problem.**
- Designers should
  - think about the problem their users will try to accomplish using the app,
  - focus on their key goals
  - remove all **obstacles** from their way

Mobile Challenges

- **Small Screens**
- The content displayed above the ***fold*** on a 30 inch monitor requires 5 screenfuls on a small 4-inch screen.
- Thus, mobile users must
  - incur a **higher interaction cost** in order to access the same amount of information;
  - **rely on their short-term memory** to refer to information that is not visible on the screen.
- It's thus not surprising that **mobile content consumption is twice as difficult**.
- **Interaction** (accurate target selection) is also much more difficult

Mobile Challenges

- **Portable = Interruptible**
- Attention on mobile is often **fragmented** and mobile device **sessions are short**.
    - Average mobile session duration is 72 seconds. (Desktop=150 seconds)
- Save state
- Transfer state
- Allow resumption on other platforms
- Prioritise essential
- Simplify interactions

Mobile Challenges

- Variable connectivity
  - Loading times
  - Task failure
  - Network usage costs

Key Laws of UX in Mobile Design

- Fitts' Law
- Hicks' Law
- Jakob's Law
- Miller's Law
- Tesler's Law
- Zeigranik Effect

Fitts' Law

- "The time to acquire a target is a function of the distance to and size of the target."
  - Smaller targets need more time to acquire
  - Further away targets take more time to acquire
- Use it to speed up interactions
  - Or to slow them down intentionally!

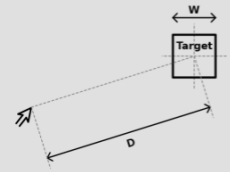
a and b are constants

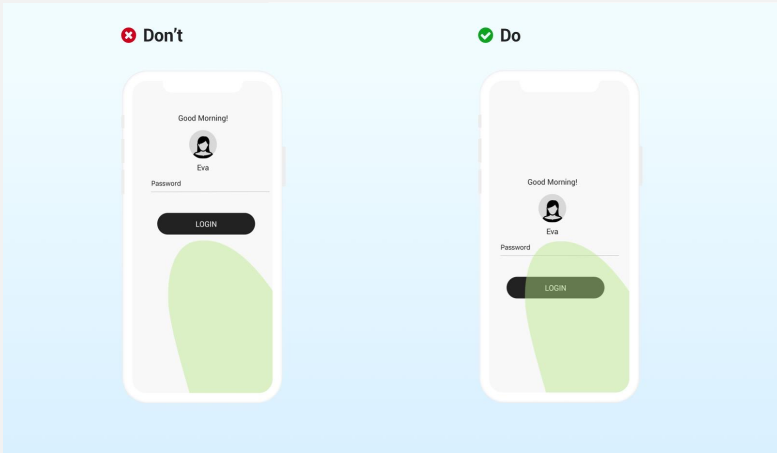
The distance from the starting point to the center of the target

$$\mathrm{MT} = a + b \cdot \mathrm{ID} = a + b \cdot \log_2\left(\frac{2D}{W}\right)$$

The average time to complete the movement.

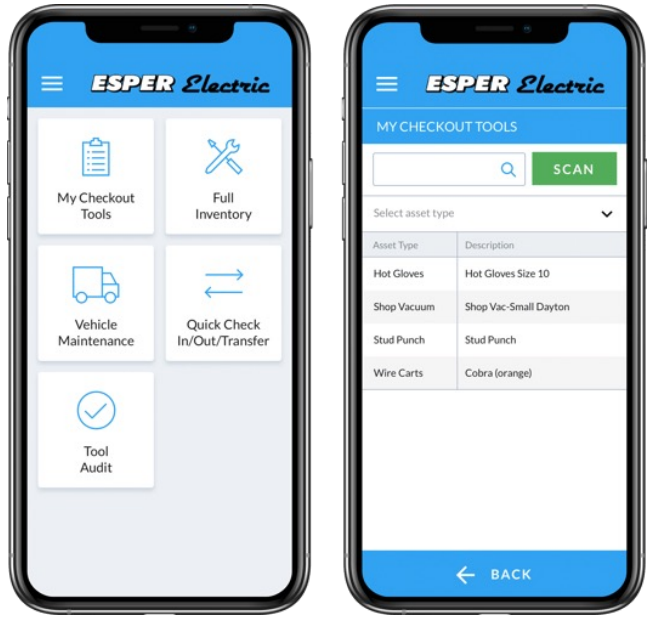
Width of the target

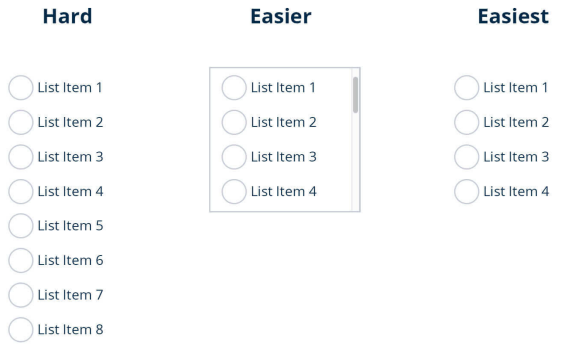




Hick's Law

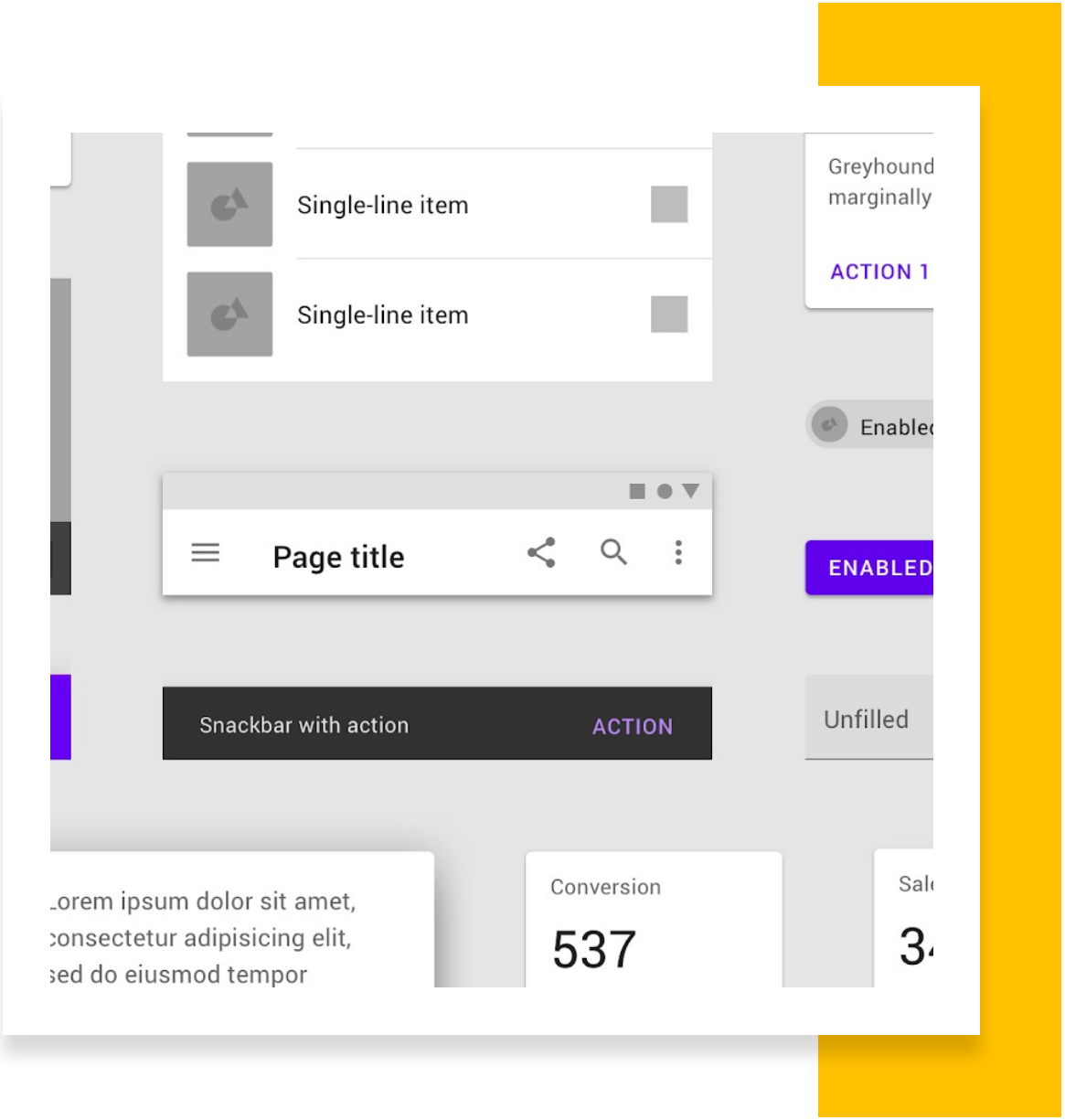
- "The time it takes to make a decision increases with the number and complexity of choices."
  - A poor UI design presents too many choices and asks people to remember too many things.
  - **Mobile UIs need not be simplistic but should be simple to use.**

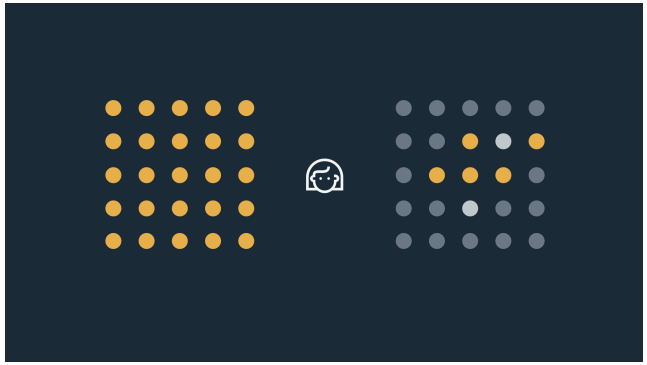




Jakob's Law

- "Users spend most of their time on other sites or apps."
  - Designers can simplify the learning process by providing familiar design patterns.
  - **People expect a product to work like all the others.**





4408675309

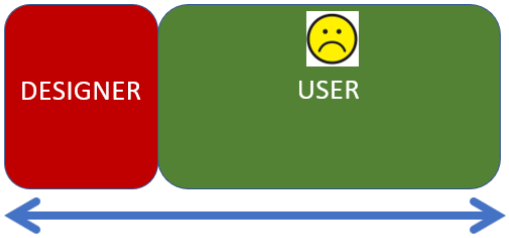
(440) 867-5309

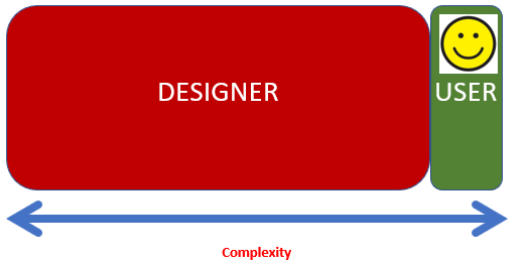
Miller's Law

- "The average person can only keep ***around seven*** (7±2) items in their working memory."
  - When this rule is disregarded, people are forced to think more than they should have to.
  - Frustration and decision paralysis (aka "overchoice", or cognitive overload).

CUSTOMER	SYSTEM
10 complexity	**90** complexity

CUSTOMER	SYSTEM
90 complexity	**10** complexity



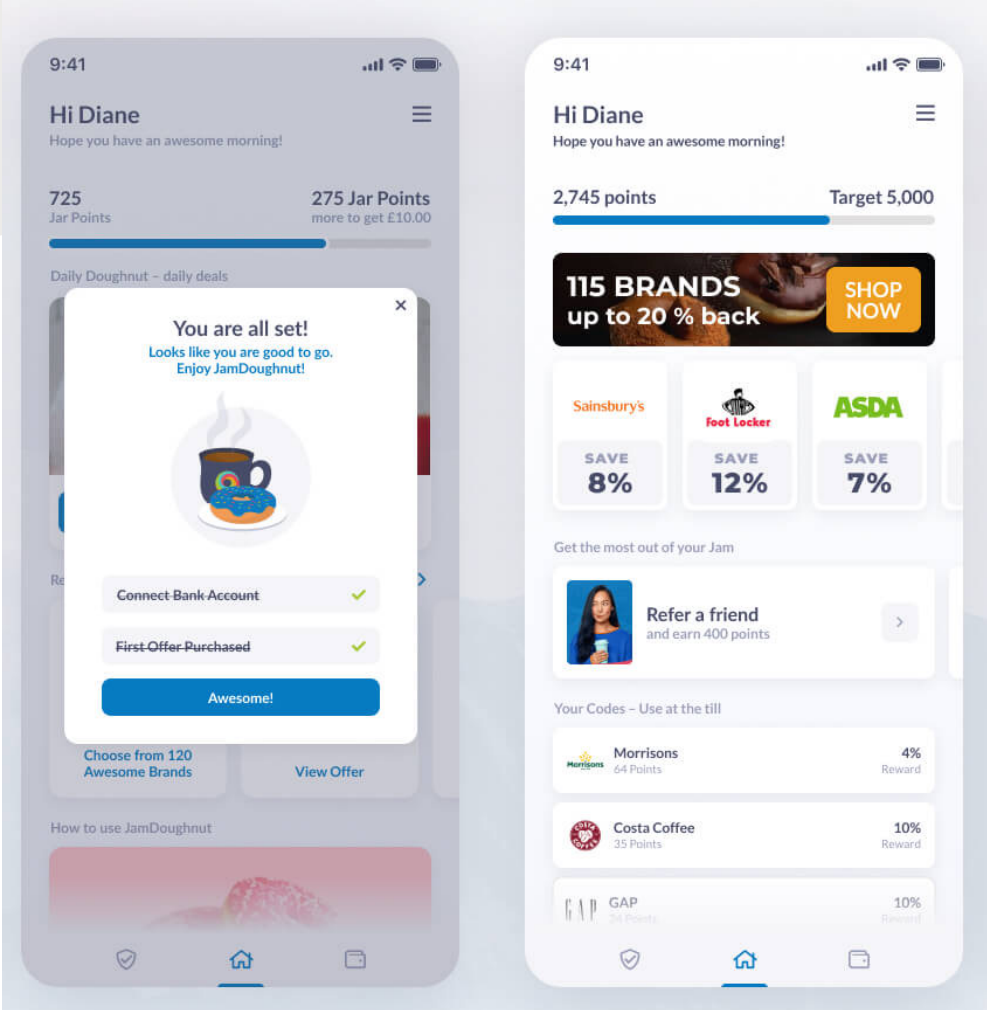


Tesler's law

- "All processes have a core of complexity that cannot be designed away and therefore must be assumed by either the system or the user."
  - Ensure as much as possible of the burden is lifted from users by dealing with inherent complexity during design and development.
  - Take care **not to simplify interfaces to the point of abstraction**.
  - Minimalist design is OK, reducing complexity is OK, but there is a certain amount of complexity that cannot be decreased.

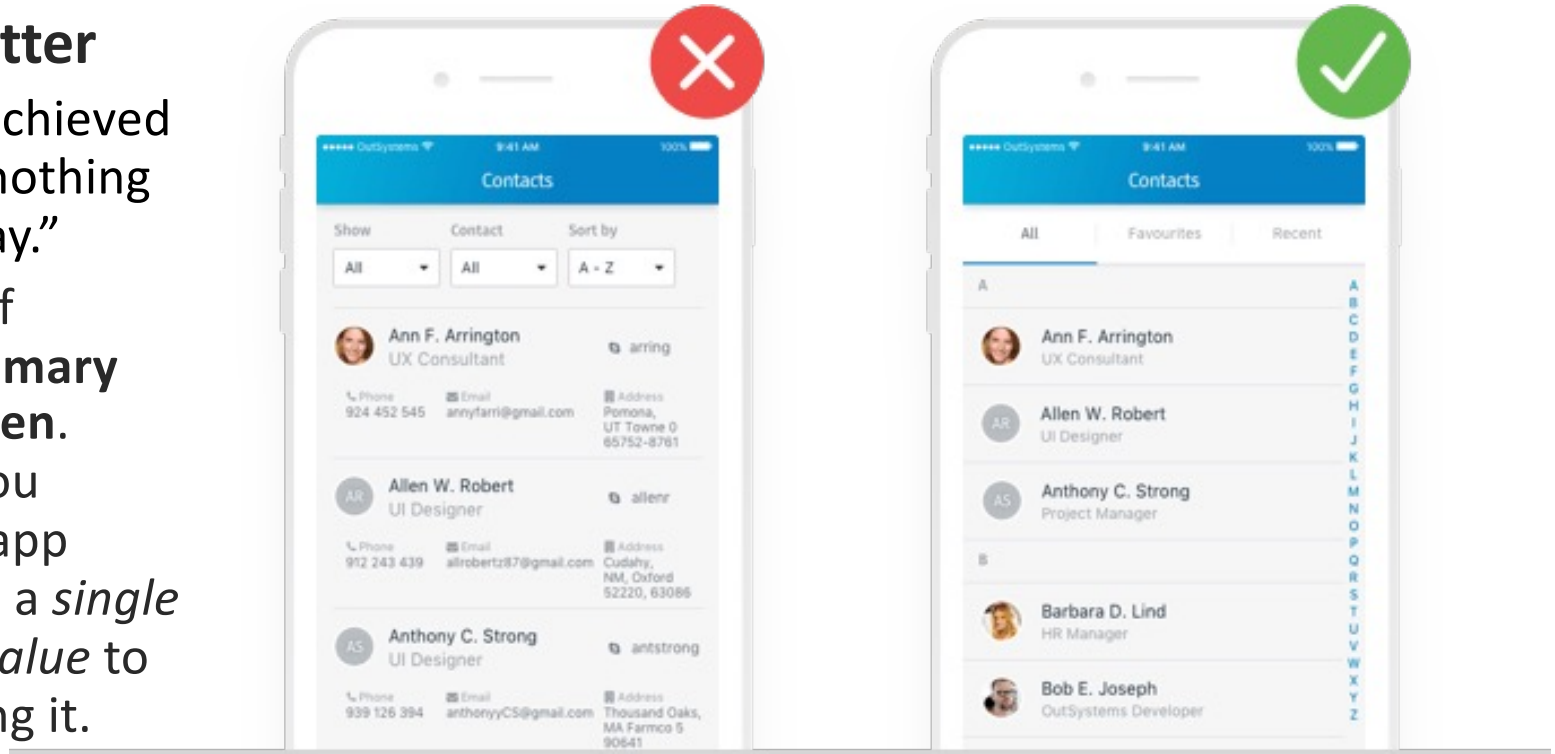
Zeigarnik Effect

- “Uncompleted tasks are easier to remember than completed ones.”
  - Our brain has a powerful need to finish what it started.
  - Use visual indicators for complex tasks that take longer
  - Use progress measures to encourage engagement
  - Invite discovery by providing clear indicators of additional content



Practical tips (1)

- **Cut Out The Clutter**
  - “Perfection is achieved when there is nothing left to take away.”
  - A simple rule of thumb: **one primary action per screen**. Every screen you design for the app should support a *single action of real value* to the person using it.

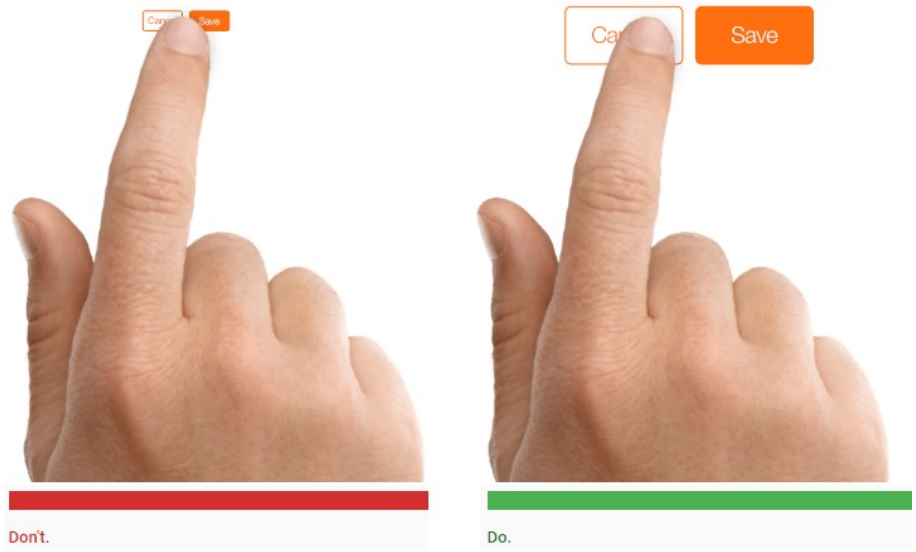


Practical tips (2)

- **Make Navigation Self-Evident**
  - **Clarity**. App uses familiar navigation patterns and each navigation element (such as icon) lead to the proper destination.
  - **Consistency.** Global navigation controls always located in the same area, no matter what part of the app.
  - **Visible**. To navigate successfully, the user should always be able to answer the question “Where am I?”

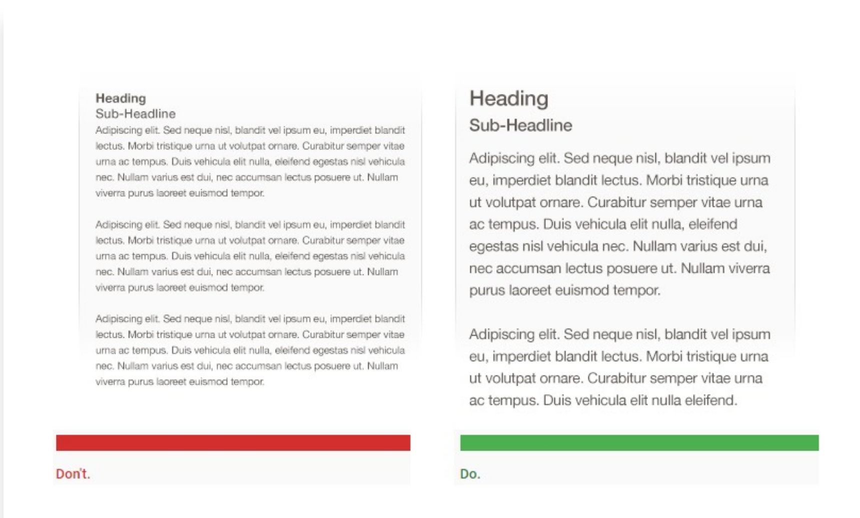
Practical tips (3)

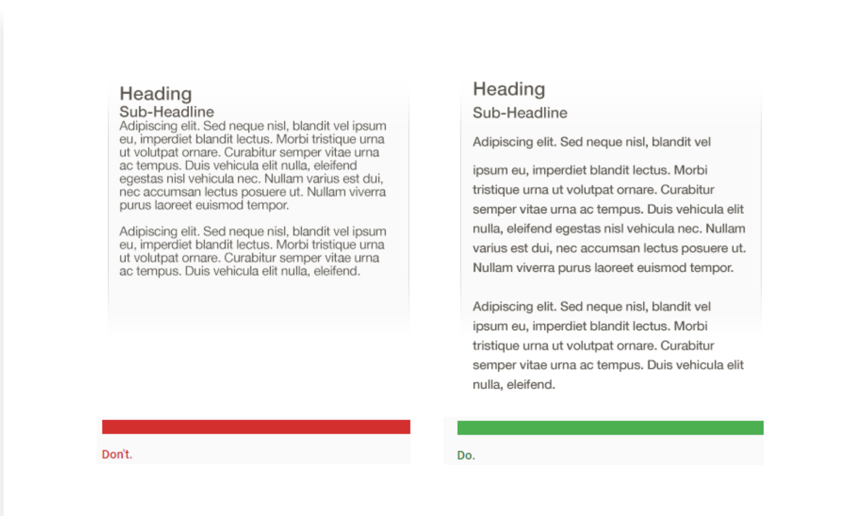
- **Design Finger-friendly Tap-targets**
  - Create controls that measure have a size 7–10 mm so they can be accurately tapped with a finger.
  - Such target allows the user's finger to fit nicely inside the touch target — users will see the borders of UI controls and will know that they're hitting the target accurately.
  - Also ensure that there is good amount of spacing between tap targets.



Practical tips (4)

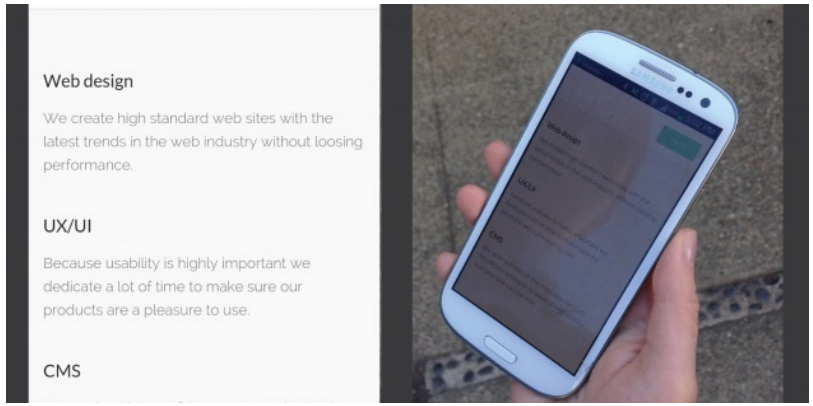
- **Text Content Should Be Legible**
  - Text should be at least 11 points so it's legible at a typical viewing distance without zooming.
  - Improve legibility by increasing line height or letter spacing.
  - Generous whitespace not only make your text more readable but will make your interface more inviting.

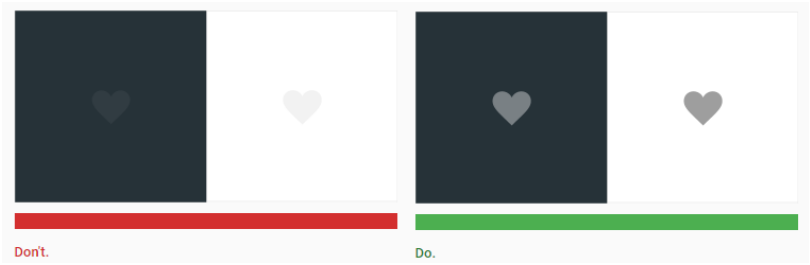


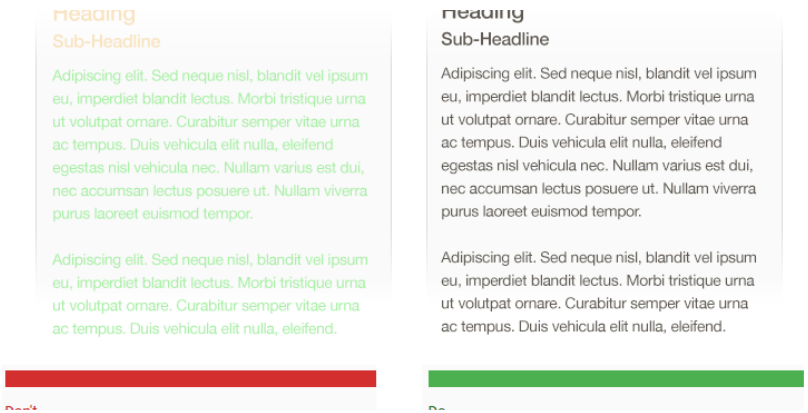


Practical tips (5)

- **Make Interface Elements Clearly Visible**
  - Use sufficient colour contrast to enable reading in sunlit environments.
  - Small text should have a contrast ratio of at least 4.5:1 against its background.
  - Large text (at 14 pt bold/18 pt regular and up) should have a contrast ratio of at least 3:1 against its background.
  - Icons or other critical elements should also use the above recommended contrast ratios.



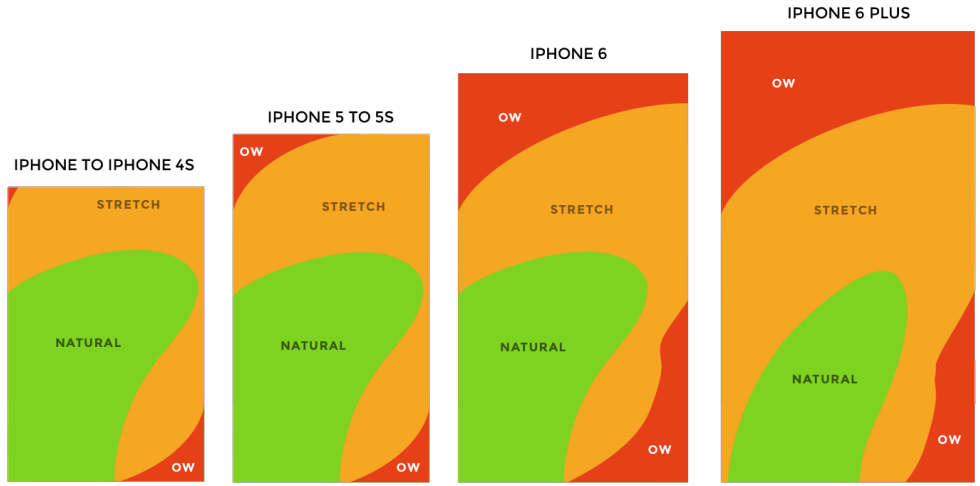




Practical tips (6)

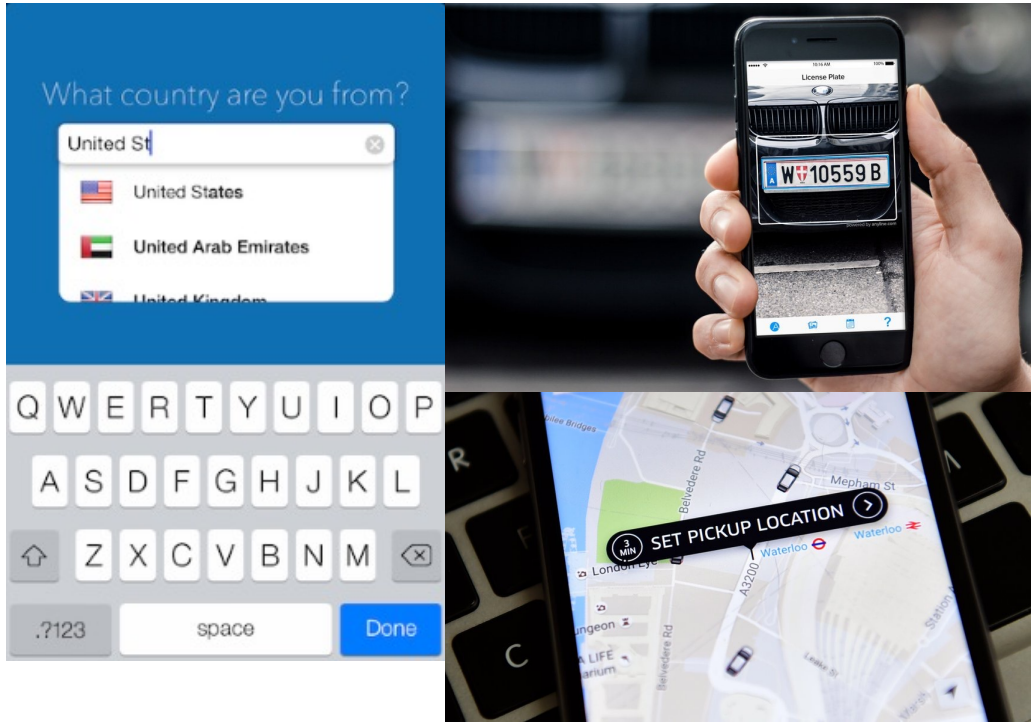
- **Design Controls Based on Hand Position**
  - 49% of people rely *on a one thumb* to get things done on their phones.
  - Place top-level menu, frequently-used controls and common actions to the green zone of the screen
  - Place negative actions (such as delete or erase) in the hard to reach red zone, because you don't want users to accidentally tap them!

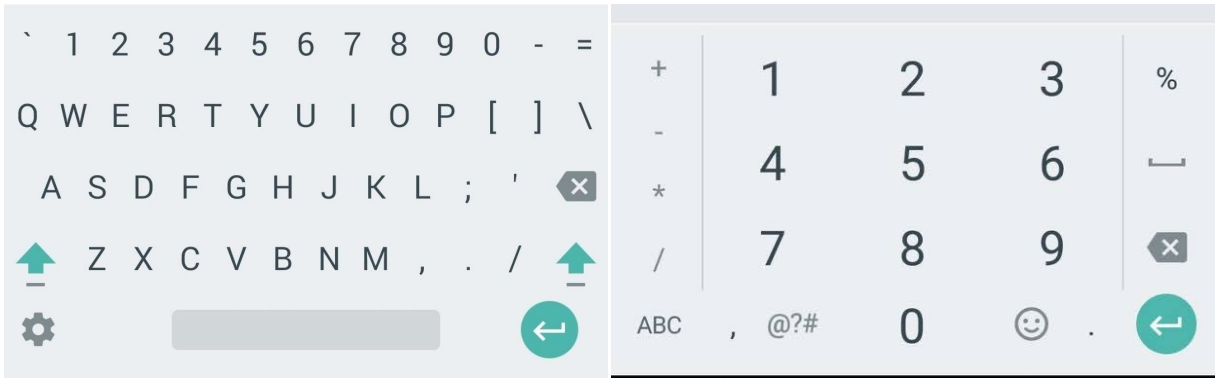
49% one handed **36%** cradled **15%** two handed



Practical tips (7)

- **Minimize Need For Typing**
  - Typing on a mobile is a slow and error-prone process.
  - Keep forms as short and simple as possible by removing any unnecessary fields.
  - Use auto-complete and personalized data where appropriate so that users only have to enter the bare minimum of information.
  - Use on-device sensors (GPS, camera, accelerometer) to provide input
  - Use the appropriate keyboard type by specifying input field restrictions!





Further reading & sources

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- https://medium.com/utopix/introduction-to-the-mobile-app-design-ae7ea7f55eb4
- https://uxplanet.org/mobile-ux-design-key-principles-dee1a632f9e6
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