

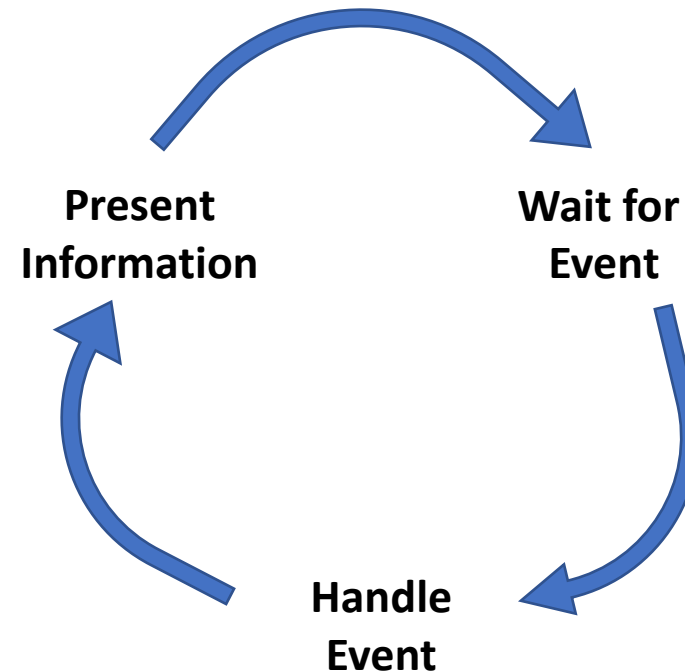
Introduction to Designing Mobile Applications

Lecture 5

Mobile Computing

Motivation

- **Observation:** All applications (not just mobile apps) have the same main loop.
 - (old) REPL: Read, Evaluate, & Print Loop
 - (new) Input Event, Processing, Presentation
- Apps present/display information and functionality based on user actions; responsive and reactive.
- ***Requires organization of information and functionality to provide effective responses.***
- This is extremely important for mobile devices because of the small screen size creating pressure for responses to be accurate and concise.

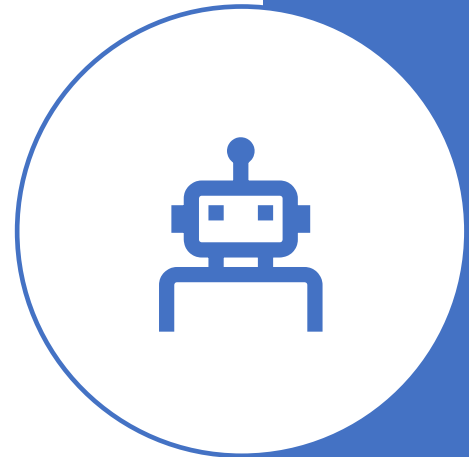


What is Information Architecture?

Historical definitions from web usage:

- a. The *structural design* of shared information environments.
- b. The combination of organisation, labelling, search, and navigation systems in websites and intranets.
- c. The art and science of shaping information products and experiences to support usability and findability.
- d. An emerging discipline and community of practice focused on bringing principles of design and architecture to the digital landscape.

Morville and Rosenfeld, *Information Architecture for the World Wide Web*, O'Reilly, 1998.





Information Architecture

The structural design of shared information environments; the art and science of organizing and labeling software products (e.g., websites, online communities, applications) to support usability and findability; a community of practice focused on bringing principles of design, architecture, and information science to the digital world.

Usually based on some form of model or concept that is applied to add detail to activities in a complex information system.

Current state of Information Architecture

- There will always be room for improvement. However, effective design methodology is well established.
- The small 'c' context (of use) elements of your application are critical to sustained user adoption and usage.

Are you giving the user something they can use?

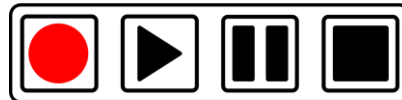
- Users have generally become accustomed to the information architectures of mobile applications over the past decade. As a developer, you are dealing less with established user expectations and mental models.
- **Expectations are critical to success.** People are lazy and don't want to learn or change their way of doing things.

What are mental models?

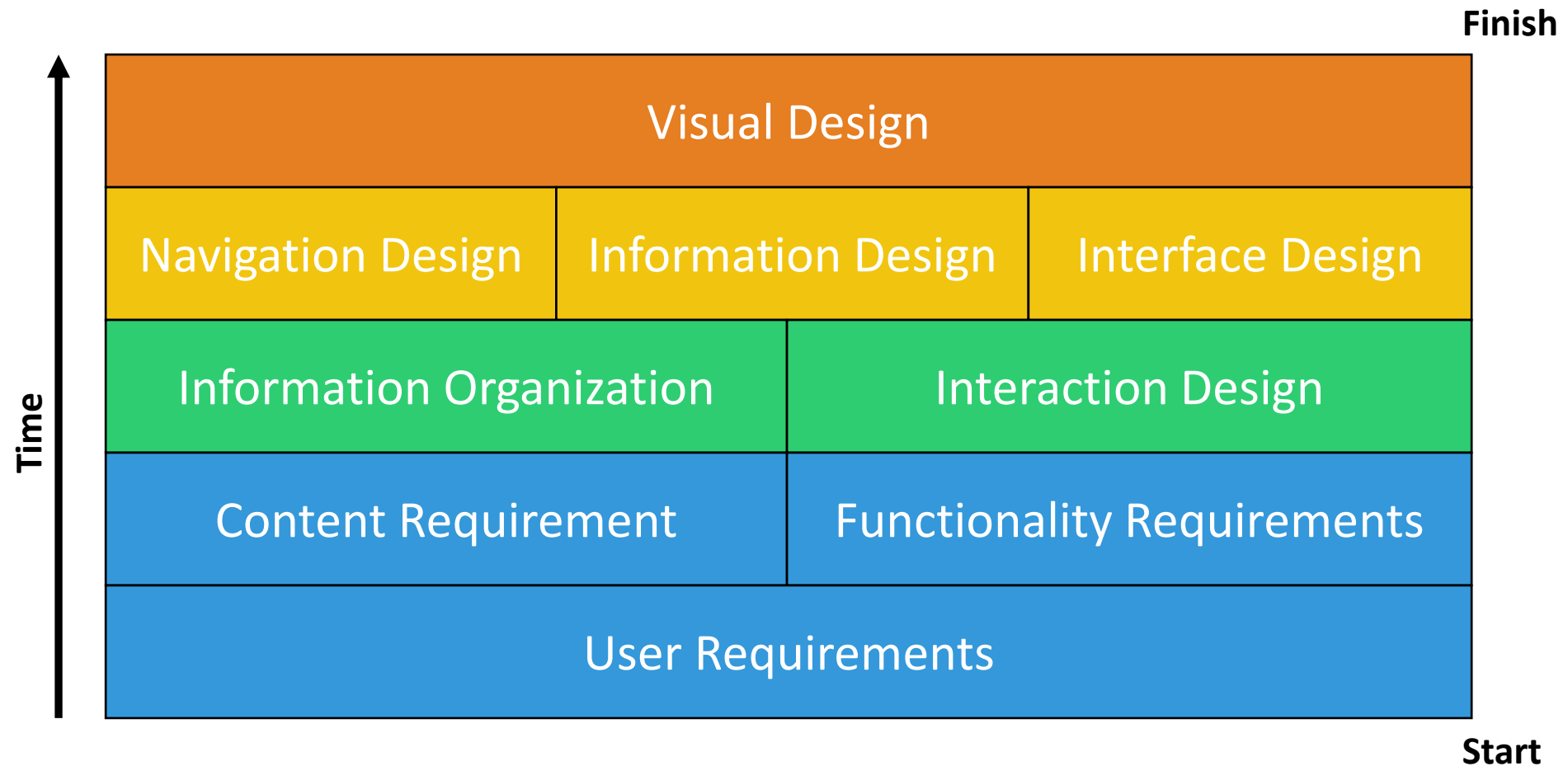
Jakob Nielsen "Mental Models"

A mental model is **what the user believes** about the system.

- A mental model is based on **beliefs and expectations**, **not facts**: it is what users expect and know (or think they know) about a system such as your mobile application.
- Users base their predictions about the system on their mental models and thus plan their actions based on how that model predicts the things they should do.
- Hopefully, users' thinking is closely related to reality (and to your thinking).
- What do these do?



Information Architecture Design Process



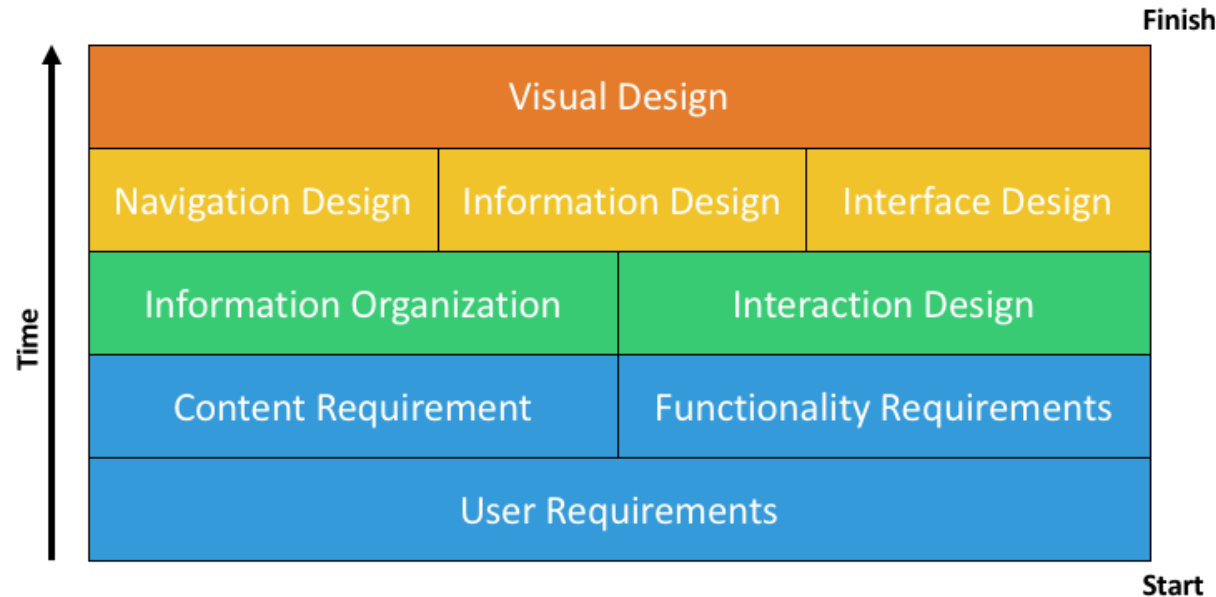
Components of an Information Architecture

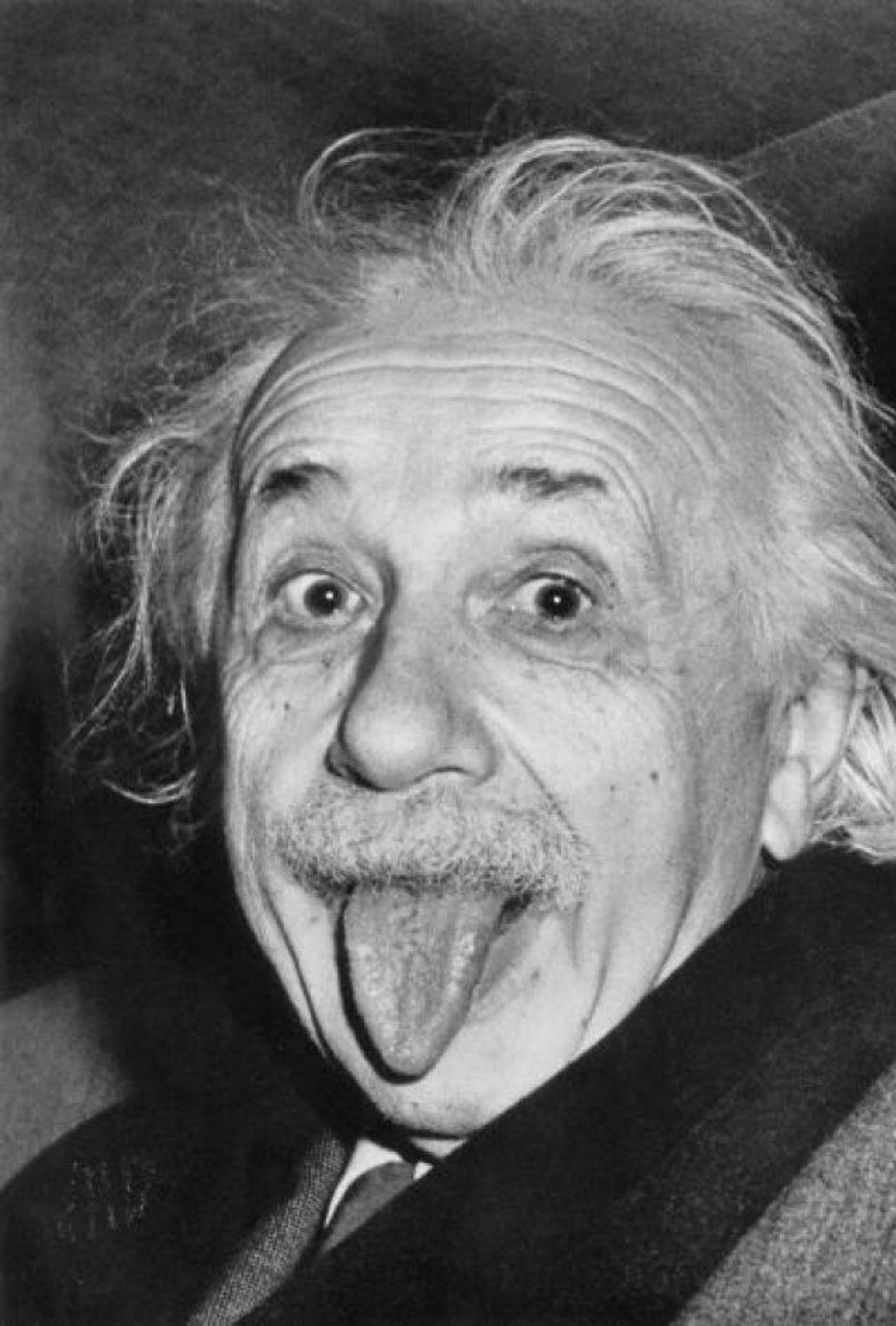
Information Organization	<ul style="list-style-type: none">• The organization of data within an information space.• <i>Where is the information / functionality?</i>
Interaction Design	<ul style="list-style-type: none">• The task-based/work-flow design of how the user interacts with the application and the information it presents.• <i>How does the user accomplish their goal?</i>
Information Design	<ul style="list-style-type: none">• The visual layout of the content.• <i>How does the user see the content?</i>
Navigation Design	<ul style="list-style-type: none">• The words and metaphors used to describe the information and interaction space.• <i>What visual cues are used to allow the user to navigate the application?</i>
Interface Design	<ul style="list-style-type: none">• The visual paradigms used to create action and understanding.• <i>Which concrete controls to use: to allow the user to navigate, view, and use the content?</i>
View Design	<ul style="list-style-type: none">• The design of the “look and feel” of the application.• <i>What do the controls and fields look like? Typically dictated by look-and-feel guidelines provided by the vendor.</i>

Information Architecture Stages

(after you have ALL your requirements)

- **Site Maps** → Information Organization
- **Storyboards** → Interaction Design
- **Wireframes** → Information and Navigation Design
- **Prototypes** → Interface Design
- **Implementation** → Visual Design





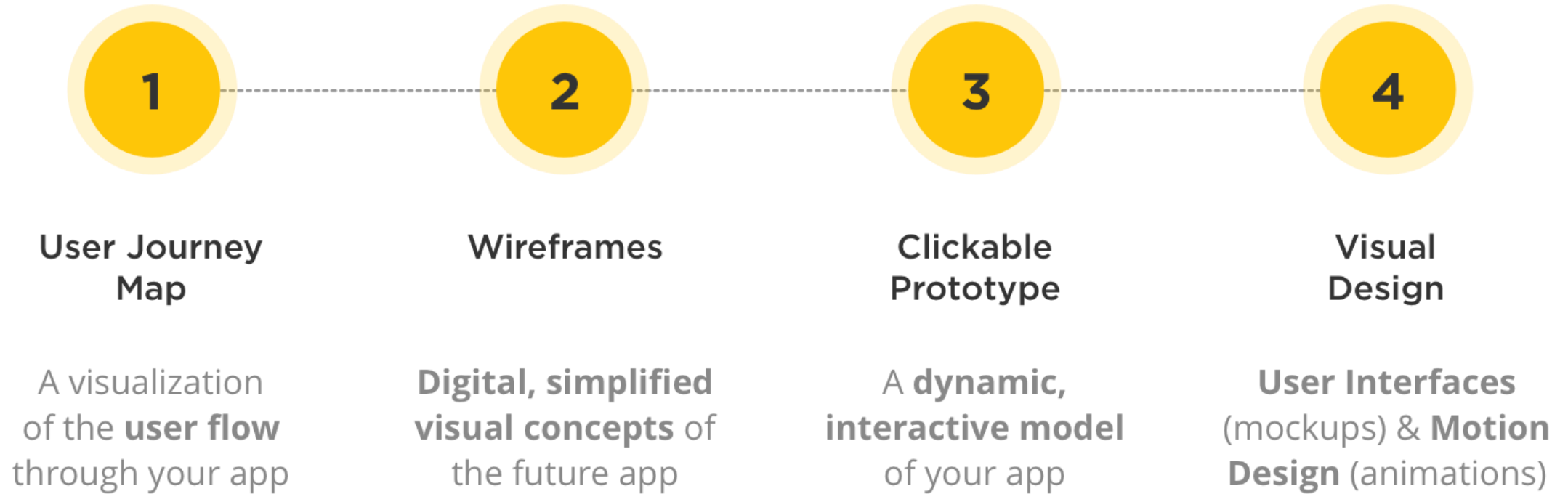
Mobile Design Philosophy

“Everything should be made as simple as possible, but no simpler” –Einstein

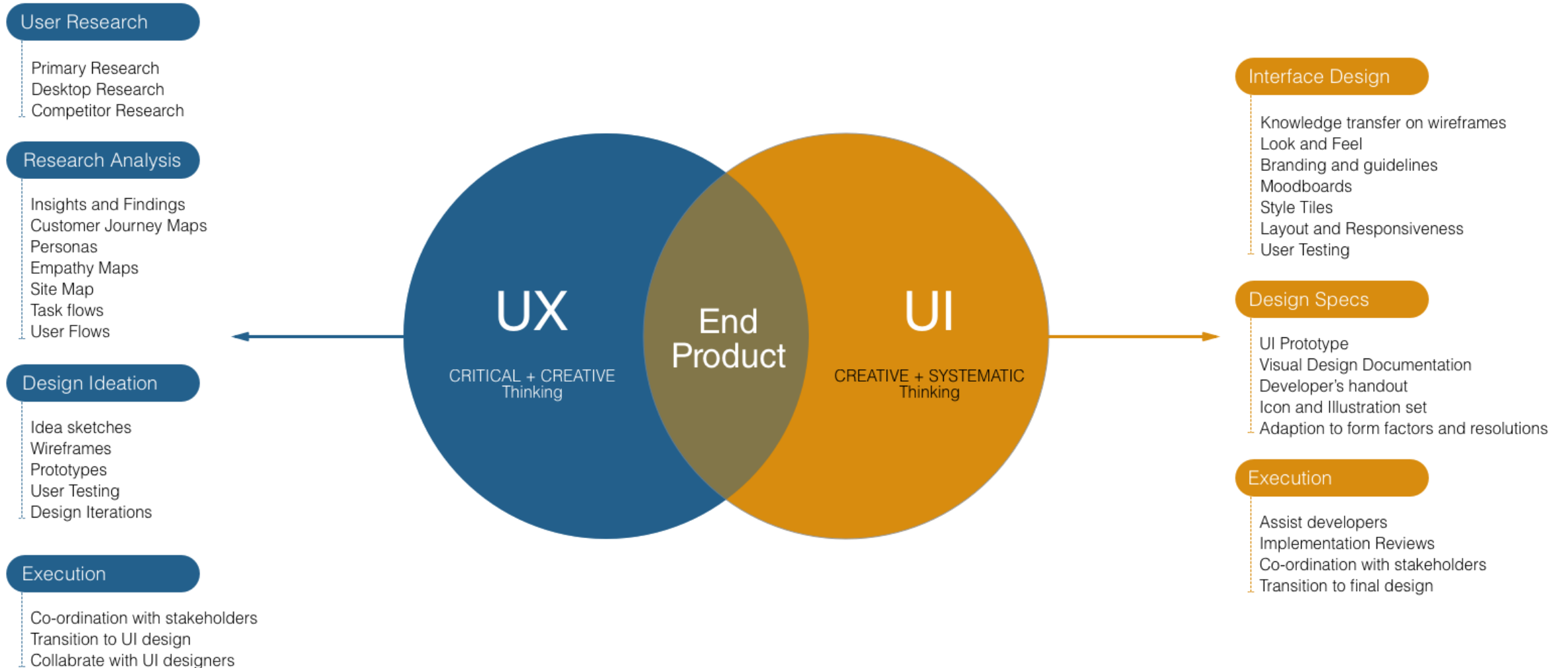
- Design Principles:
 - **Keep it simple.**
 - Support user-defined goals – Satisfy the requirements.
 - No bells and whistles. Avoid “Gold Plating.”
 - Use clear and simple labels.
 - You don’t have a lot of room.
 - Limit opportunities for mistakes.
 - Attention and accuracy considerations. Recognition, not recall.
 - Maintain user’s context.
 - Present enough information so user does not get lost — this is a hard tradeoff.
 - **Understand the differences in designing for desktop v. mobile. But really, are they very different apart from the screen size?**

Where do we start?

A Simple Design Process



Heavy-Weight Design Process



Our Design Process

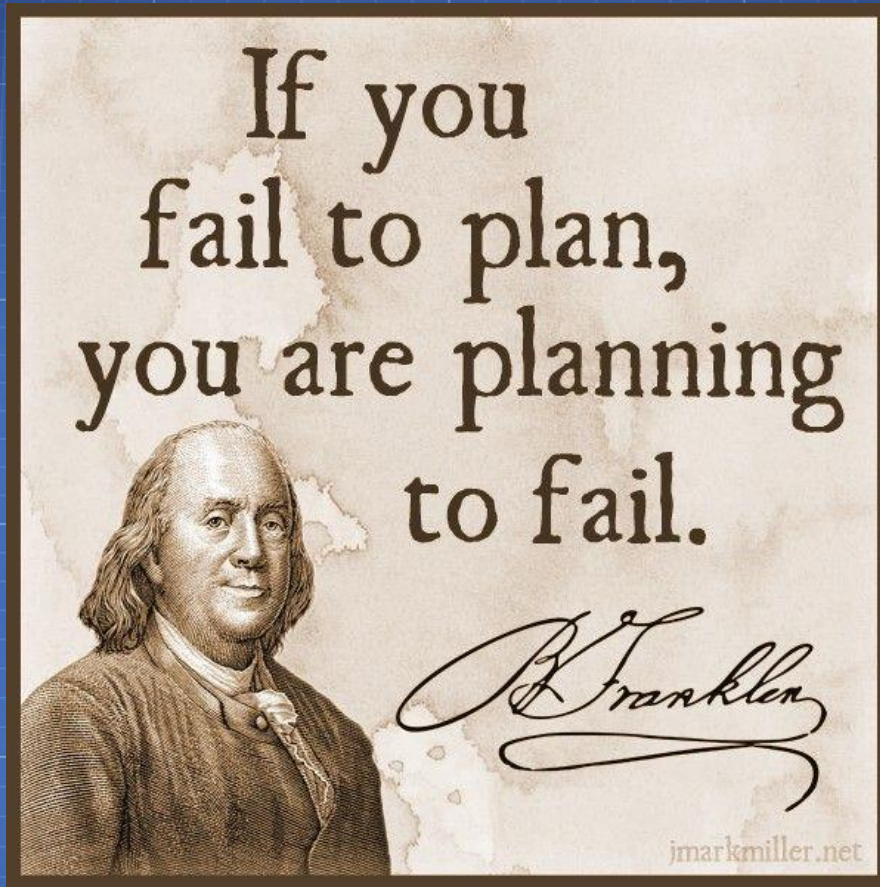
Requirements: Use-cases

Sitemap

Storyboard

Wireframes

Prototypes



You cannot “hack together” a good application. Success requires following a plan based on a design!

Success Takes Time

Successful products usually take years to develop

E.g.: WoW, Pokemon Go

Upon release it can take years to build up a user base

E.g., Tinder

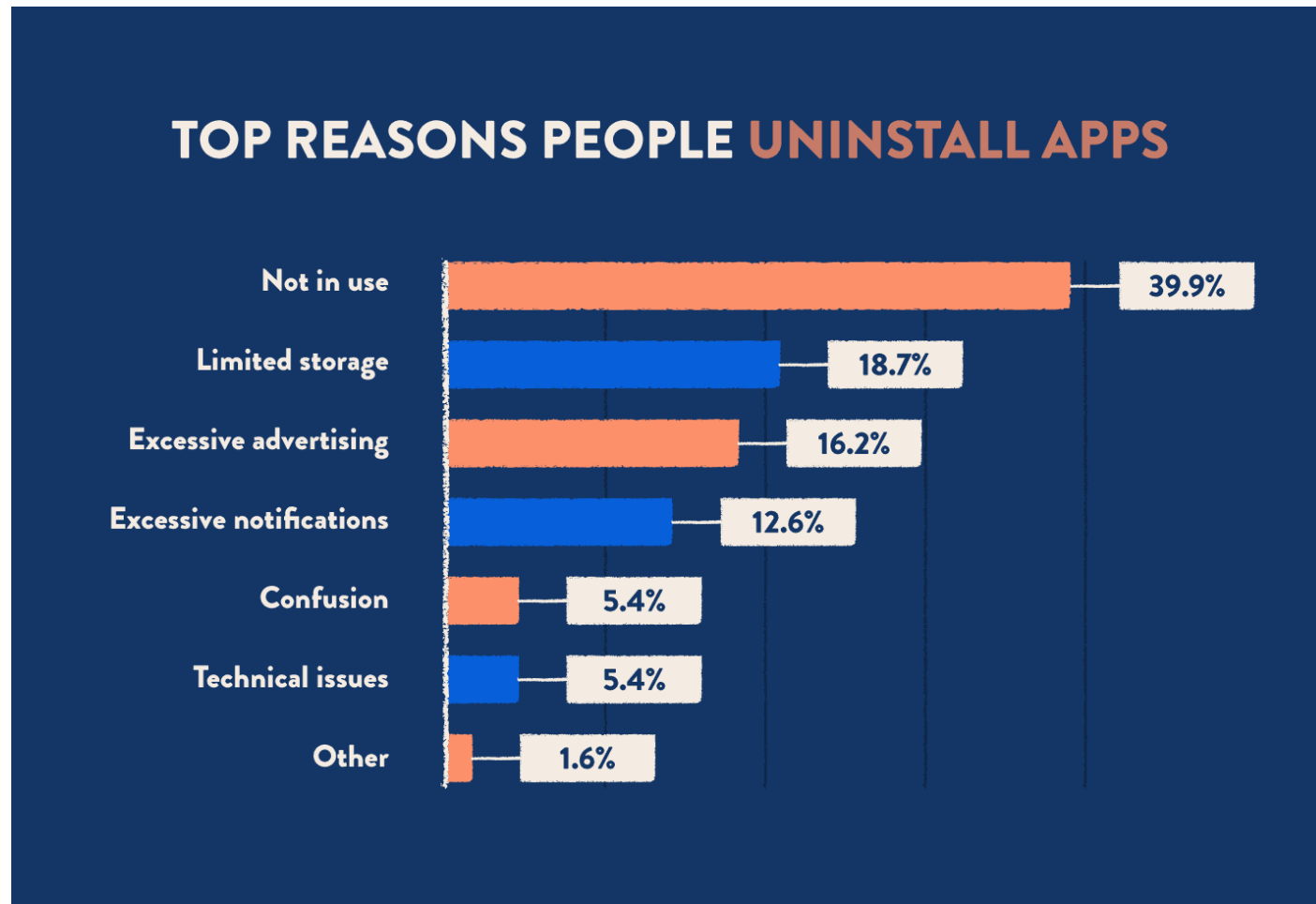
Devs can save some time by starting with a desktop or web product, but you can't "just copy on Android"

E.g., Messenger, YouTube, Google Maps

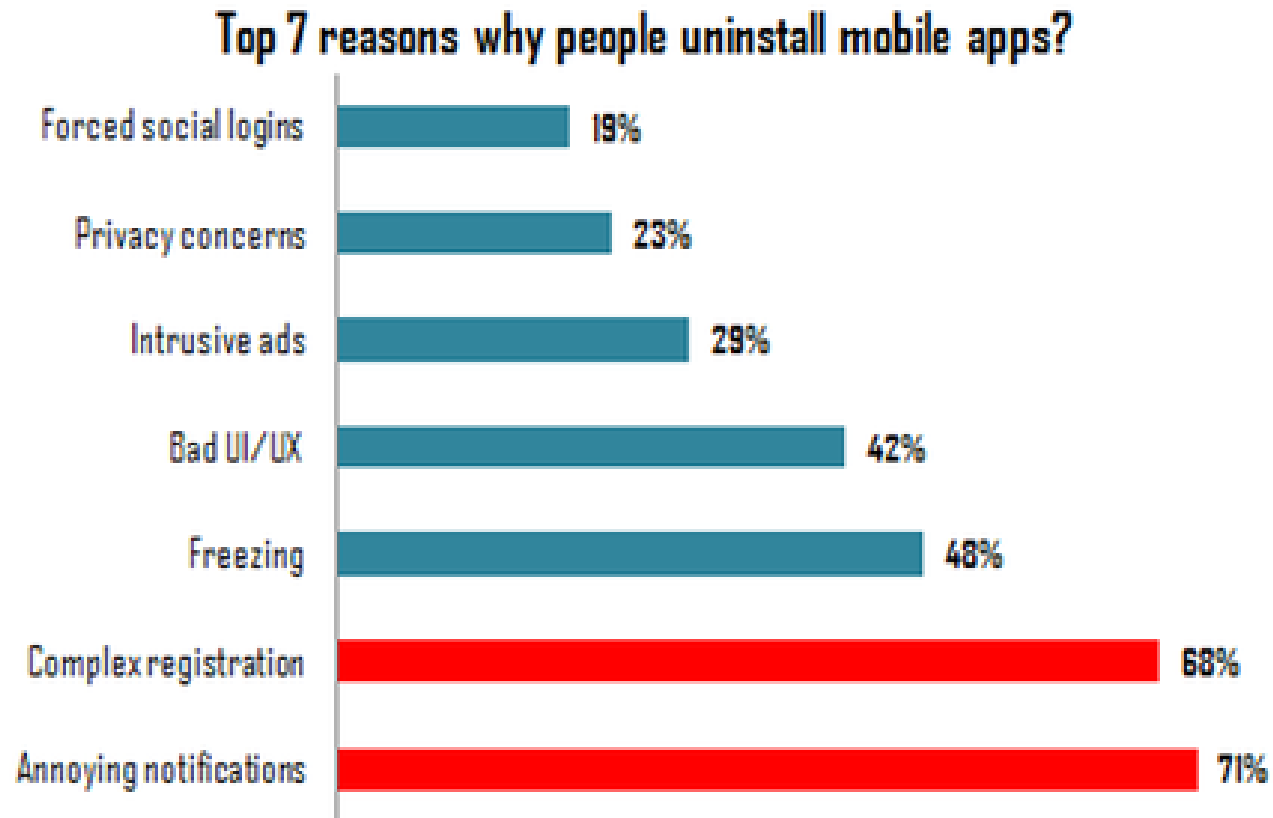
According to MindSea (mindsea.com/app-stats):

- There are approximately 100,000 new applications in the Google Play store each month
- The average number of applications downloaded each month is decreasing (0/month for 2/3 of users).

Why aren't they being used?



Well, maybe the users don't like:



Source: Appiterate Survey

as a % of all respondents. Each participant mentioned three reasons

Trust

The key reasons an application becomes distrusted (and uninstalled) are:

- Requires too many permissions.
- Other software indicates the application is malware.
- App sends invites/posts/notifications to friends without users knowledge.
- Software only works well on fast networks or wifi (technological distrust).
- Developer is too slow to respond to tickets or help requests.

MVC:

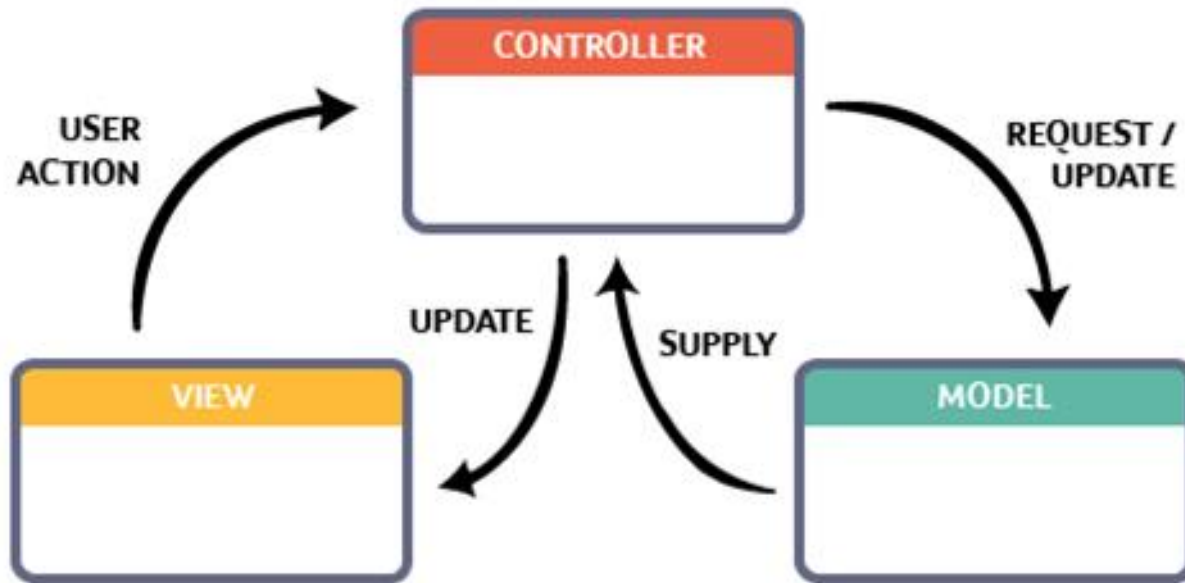
A basic architectural pattern

There are many different architectural patterns.

- MVC: Model View Controller
- MVVM: Model View ViewModel
- MVP: Model View Presenter
- MVI: Model View Intent

We will start with MVC (for now) since the others are based on it.

MVC



- **Model**: The data model. You can describe this using an ER diagram.
- **View**: The UI. You can describe this using a sitemap and wireframes.
- **Controller**: The code that populates the view using the model. You can describe this using UML structure diagrams (e.g., class, package, deployment, object).



Design:

- Create the UI/UX using sitemaps, wireframes, prototypes, user-stories, use-cases, etc.
- Define your data by creating a model using ER (which works for NoSQL, Relational, OO, and ad-hoc data bases).
- Link the two by defining a controller and use UML to describe the code. Treat APIs like an object (as you can encapsulate them in an object). Add anything else you need for support.
- Do your CRUDdy check. Can you fully manipulate the data?

