# CSS233 WEB PROGRAMMING I

## LECTURE 03 UI/UX, Wireframe and Prototype

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# Outline

- UX vs UI
- UX trends
- The key elements of UX process
- User centered design
- Accessibility
- Usability principles
- Wireframe
- Practical tips
- Mockup
- Prototype


Hit any key to continue...


Press Any Key
To Start.
WHERE IS THE
"ANY" KEY?!

# What is a good design?

- A solution that serves the users and satisfies the client
- Does what the users need and want
- Natural to use
- Helps them avoid trouble

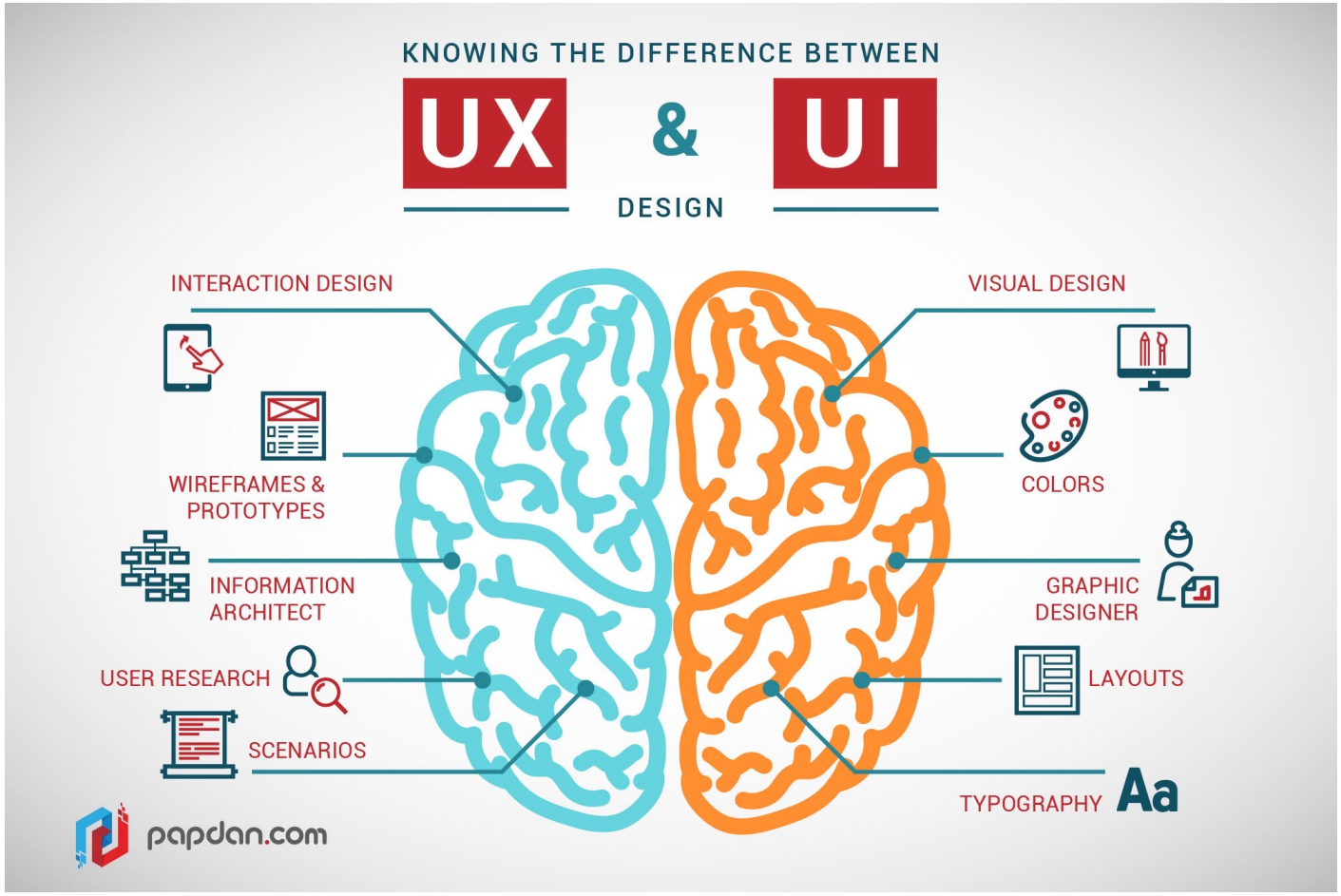
**Easy to say, very hard to do well**

# UX definition

- The **internal experience** that a person has as they interact with every aspect of a products and services.
- Puts the end user at the center of the universe and **defines the system from that perspective**
- Usability is finding the **best match** between **a user's needs** and **a product's use**
- An appreciation for UX affects
  - Functionality
  - System Organization and Structure
  - Interactions, Look and Feel
  - Access

# UI definition

- Everything designed into an information device with **which a person may interact.**
- This can include display screens, keyboards, a mouse and the appearance of a desktop.
- It is also **the way** through which a user interacts with an application or a website.
- UI fulfills two key UX needs:
  - Interactions, Look and Feel
  - Access


KNOWING THE DIFFERENCE BETWEEN
UX
&
UI
DESIGN
INTERACTION DESIGN
WIREFRAMES &
PROTOTYPES
INFORMATION
ARCHITECT
USER RESEARCH
SCENARIOS
VISUAL DESIGN
COLORS
GRAPHIC
DESIGNER
LAYOUTS
TYPOGRAPHY
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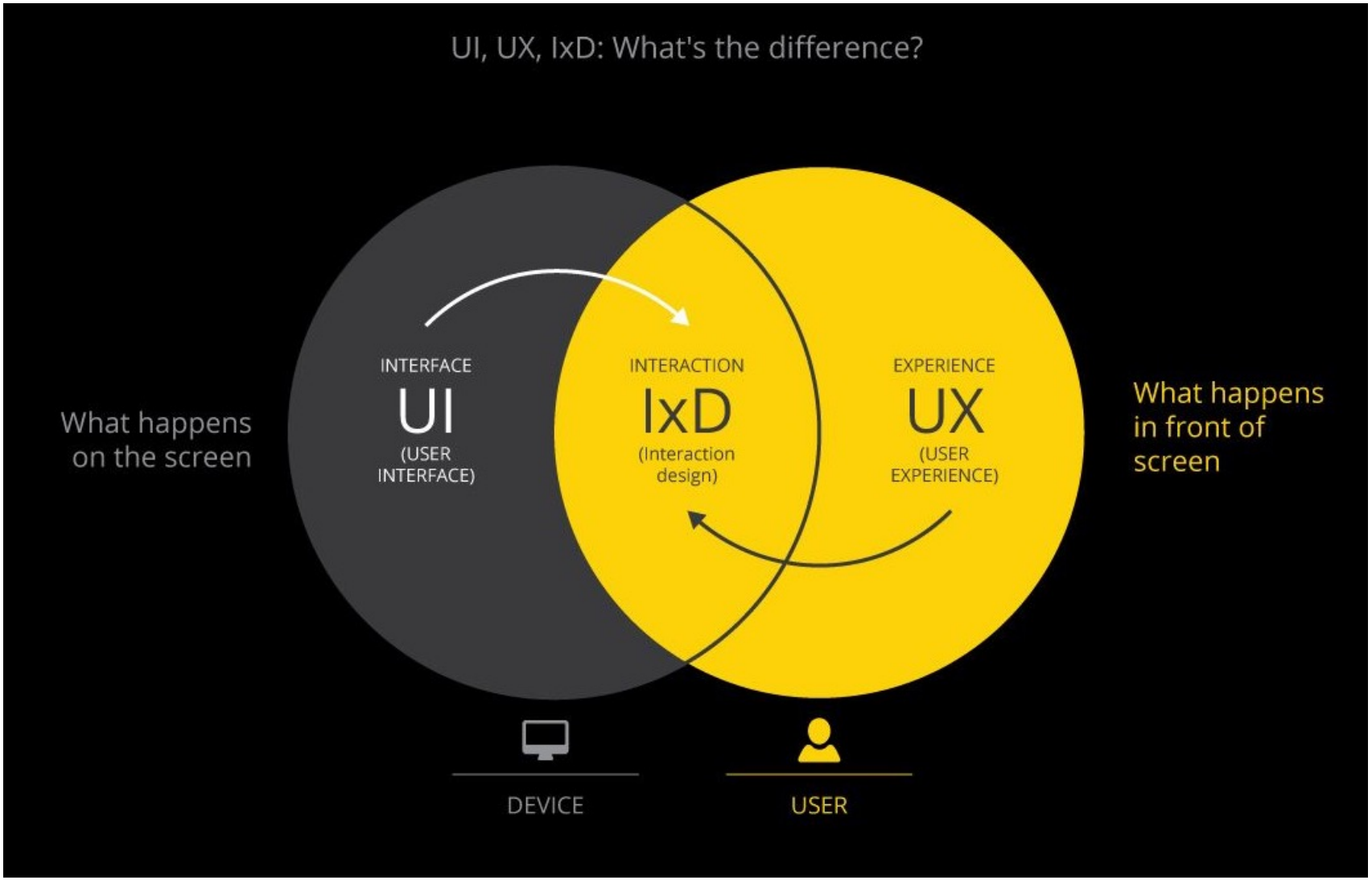

UI, UX, IxD: What's the difference?
What happens on the screen
INTERFACE
UI
(USER INTERFACE)
INTERACTION
IxD
(Interaction design)
EXPERIENCE
UX
(USER EXPERIENCE)
What happens in front of screen
DEVICE
USER

**UI design** is what makes an interface **beautiful**
and
**UX design** is what makes an interface **useful**.

# User Experience focuses on...

- Understanding of the user:
  - their needs
  - their values
  - their physical/mental abilities
  - their environments, etc.
- Aligning business goals with the user's interactions of the product, system and services.
- Understanding the foundation of the technologies being used: feasibility, scalability, limitations, etc.

# User experience (UX)

- If you have ever purchased a product or benefitted from a service, you are a **user**.

- When you interact with a product, service, or company, you are having an **experience**.

- Companies want you to have a **good experience** using their product or services.

# UX Trends

- Personalization
  - Everyone wants to feel special.
  - Giving the users what they want without them having to ask for it.

- Micro-interactions
- Designing for Any Device
- Gamification Redefined

# The Four Key Elements of the UX Process

- **Behavior**
  - Learning about their habits and goals
  - Identifying needs and constraints
  - Aligning with existing behaviors to create solutions that are easy to use (efficient) and solve a real problem (effective)

- **Strategy**
  - UX is about design **empathy**, which means translating user needs into **actionable solutions**.
  - Needs to observe and understand what's happening from the user's perspective.

# The Four Key Elements of the UX Process

- **Usability**
  - Good design is ultimately determined by **usability**.
  - However, if the design is not usable, all delightful details don't matter.
  - Creating products that **anyone can use**, especially if they have a **disability** or **impairment**.

- **Validation**
  - A critical piece of the UX process.
  - Ideally products need to be tested with users before deployed to the public.

# User centered design

- Three Steps
  - Identify who the users are
  - Identify what they want to accomplish
  - Constantly assess (1) and (2)

# Can you please everyone?

- Multiple Sizes
  - You can have different products for different types of users.

- One size fits most/enough
  - You can have a product for an average user and aim for average within a subset of the market

- Either way, you **can not** optimize the experience for **EVERY SINGLE** user.

# Web Site Accessibility

- Making a web site accessible involves:
  - Ensuring your web site can be used effectively and efficiently with assistive devices such as screen readers
  - Making sure that a variety of disabled users can use your web site directly
  - Adding special HTML elements to handle various disabilities
  - Having separate web sites for the blind and other disabled groups
  - Testing your web site with a broad range of disabled users.

# What does Universal Accessibility mean?

- Letting everyone access your web site
- What does everyone include?
  - Non-Native speakers
  - Persons with disabilities
  - Everyone

# Who Are Your Users?

- Do you have a particular set of users in mind?
- Are you a representative user?
  - 6-8% of males are color blind
  - 30-70% of CS students have wrist problems
  - 65-75% of people wear glasses or contacts
  - 17% of impairments are uncorrectable
  - 6% of the population
  - ~50% as people get older
- THERE IS NO TYPICAL USER

# Typical Disabilities

- Vision Problems
  - Blindness, low-vision, presbyopia, color blindness
- Hearing problems
  - Deafness, high-frequency loss
- Movement problems
  - Paraplegic, wrist problems, broken arm/hand, MS
- Difficulty in reading
  - Dyslexia, illiterate

# Why Should You Care

- This is only a small subset of potential users
  - You should have enough users without these
  - It can be a lot of work adapting your app to all potential users
  - Is it worth it?
- It is the right thing to do
  - But lots of companies (esp. startups) don’t bother
- Makes your application better
  - It tends to make you application better in any case
  - Many of the things you do for accessibility help the overall look and feel and usability of the interface
- Required legally

# Making Web Sites Accessible

- General rules
  - HTML provides features that can enhance accessibility
    - Also feature that have the opposite effect
  - You should know what helps and what hinders
    - Use what helps
    - Avoid what hinders
- The bulk of the work has been done for you
  - W3C web accessibility content accessibility guidelines
  - Understanding this make accessibility easier

# Guideline Examples

- Understandability guidelines
  - Make text readable and understandable
  - Make content appear and operate in predictable ways
  - Help users avoid and correct mistakes
- Robustness guidelines
  - Maximize compatibility with current assistive tools
  - Maximize compatibility with future assistive tools
- **DESIGNERS**:
  - Read and understand these guidelines before designing a web site

# Jacob Nielsen's 10 Principles Of UI Design

## 1. Match the real world

- Ensure that users can understand meaning without having to go look up a word's definition.
- Never assume your understanding of words or concepts will match that of your users.
- Natural mapping
  - Physical arrangement of controls should match arrangement of function
- Actions should have immediate, visible effects
  - Kinds of feedback - visual, audio, haptic

# Jacob Nielsen’s 10 Principles Of UI Design

## 2. Consistency and standards

- Users should not have to wonder whether different words, situations, or actions mean the same thing.

## 3. Help and documentation

## 4. User control and freedom

- Users may run in trouble by using a system function by mistake and need a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue

# Jacob Nielsen's 10 Principles Of UI Design

## 5. Visibility of system status

- The system should always keep users informed about what is going on, through appropriate feedback within reasonable time.

## 6. Flexibility and efficiency

- The system can cater to both inexperienced and experienced users.
- Allow users to tailor frequent actions.

## 7. Recognition, not recall

- Instructions for use of the system should be visible or easily retrievable whenever appropriate.

# Jacob Nielsen's 10 Principles Of UI Design

## 8. Error prevention

- Even better than good error messages is a careful design which prevents a problem from occurring in the first place.
- Either eliminate error-prone conditions or check for them and present users with a confirmation option before they commit to the action.

## 9. Help users recognize, diagnose, and recover from errors

- Error messages should be expressed in plain language (no codes), precisely indicate the problem, and constructively suggest a solution.

## 10. Aesthetic and minimalist design

# Shneiderman's 5 Criteria for Measuring Usability

- **Time to learn**: The time it takes to learn some basic level of skills
- **Speed of UI performance**: Number of UI "interactions" it takes to accomplish tasks
- **Avoiding user errors**: How often users make mistakes
- **Retention of skills**: How well users remember how to use the UI after not using for a time
- **Subjective satisfaction**: The lack of annoying features

# Tradeoffs Among Criteria

- We always have tradeoffs among the criteria
- Most people today equate “user friendly” with “time to learn” – this is a narrow view
- Making a UI easier to learn often slows
  - Example: Many GUIs are easy to learn, but slow
  - Example: Many command languages are fast, but hard to learn
- To be an effective UI designer:
  - Consider reach criterion carefully and prioritize before designing
  - Decide what is acceptable for each of the five criteria

# Improve Usability: Usability testing

- Get representative users
- Ask the users to perform representative tasks
- Observe how the users use or interact with the UI
  - What the users do
  - Where they succeed
  - Where they have difficulties with the UI
- They will likely not perform the tasks in the way you expect

# Tips When Working on Usability

- Test the old design before staring a new design
- Test your competitors' designs
- Study how users use the system
- Make paper prototypes and test them
  - Transform paper prototypes to executable prototypes, iteratively refine the design idea
- Inspect the design relative to established usability guidelines
  - Don't wait until you have a fully implemented design.
  - It will be impossible to fix the critical usability problems, especially problems related to architectures.
- Start user testing early in the design process and keep testing every step
- Implement the final design, test it again.

# UX best practices for website owners

- **Mapping out what content you have and what content you need**.
  - The content should guide the information architecture
  - A content-centric approach takes care of the page transitions and overall flow of the website.

- **To know your users' goals**.
  - Why did they come to your website?
  - What do they need to be able to do, and how can you help them quickly accomplish it?

- Focus should be on **easier decision-making and faster navigation**.

- **Don't ask too much upfront in your website's lead forms!**
  - Each field a user needs to enter is a small barrier to conversion.
  - A good UX design is about asking only for the basic details required to start a conversation with your customer.

# UI Best Practices for Website Owners

- Always **map out the steps toward conversion clearly *before* you start to design**
  - To plan for easy navigation at any stage of the user journey.
- Having **a brand strategy including brand identity guidelines.**
- **Plan UI design for shorter attention spans.**
  - With an average attention span of 8 seconds, modern users tend to scan content.
  - Therefore, most of the website content you create is scanned and not read.
- **Stay away from flashy images, videos, and components that can slow down the page loading speeds**.
- **Experimental strategies can end up backfiring**.
  - Your customers and regular visitors are familiar with a set pattern of navigations, and menu styles used across every website they use in a day.
  - Any changes or quirky additions to the norm might effectively kill the seamlessness of the process and cost you a conversion.

# Wireframe

- Wireframe is a two-dimensional skeletal outline of a webpage or app.
- Wireframes provide a clear overview of the page structure, layout, information architecture, user flow, functionality, and intended behaviors.
- As a wireframe usually represents the **initial product concept, styling, color**, and **graphics are kept to a minimum**.
- Wireframes can be drawn by hand or created digitally, depending on how much detail is required.

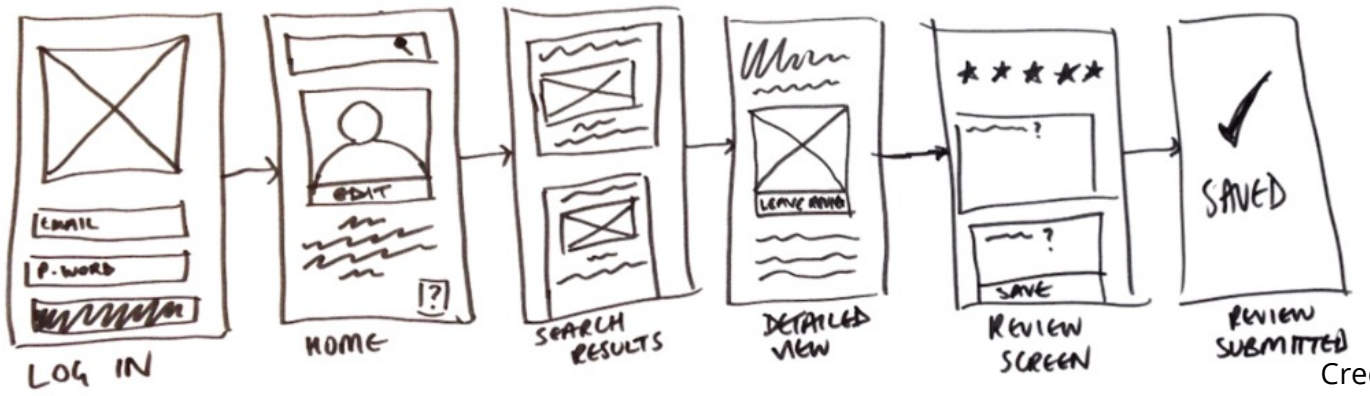
# What is the purpose of wireframing?

- Wireframes keep the concept user-focused
- Wireframes clarify and define website features
- Wireframes are quick and cheap to create

# Types of wireframes

## Low-fidelity wireframes

- To be rough, created without any sense of scale, grid, or pixel-accuracy.
- Low-fidelity wireframes are ideal if you've got stakeholders or clients in the room and you want to sketch something up with a pen mid-meeting.
- They're also incredibly useful for designers who have **multiple product concepts** and want to quickly decide which direction to go down.

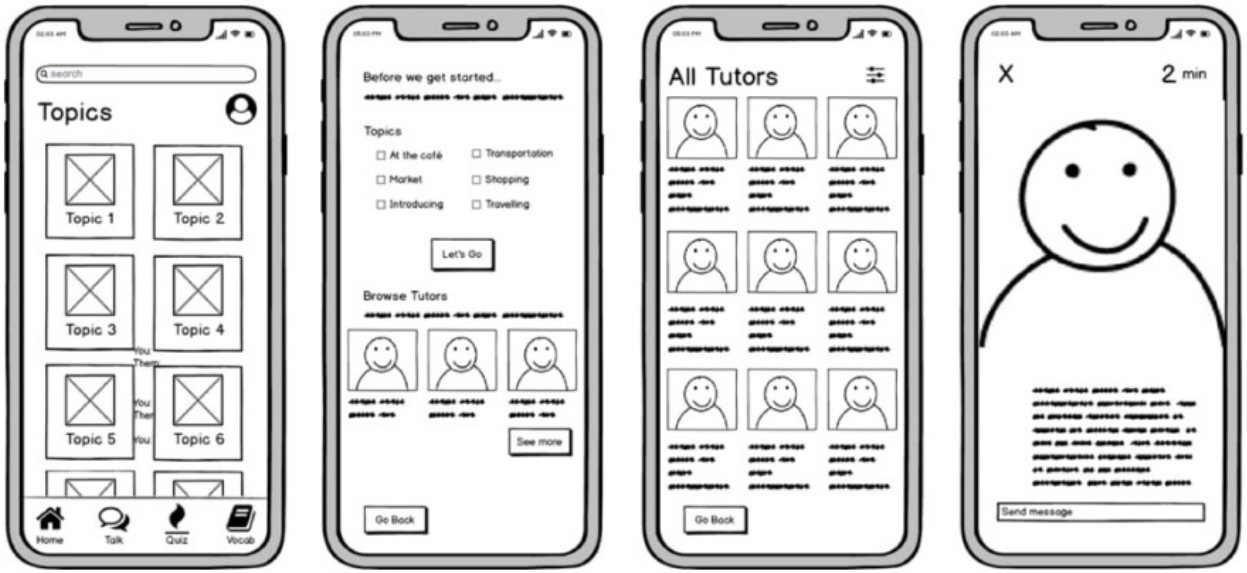



Credit: careerfoundry.com

# Types of wireframes

## Mid-fidelity wireframes

- More accurate representations of the layout.
- Avoid distractions.




Credit: careerfoundry.com

# Types of wireframes

## High-fidelity wireframes

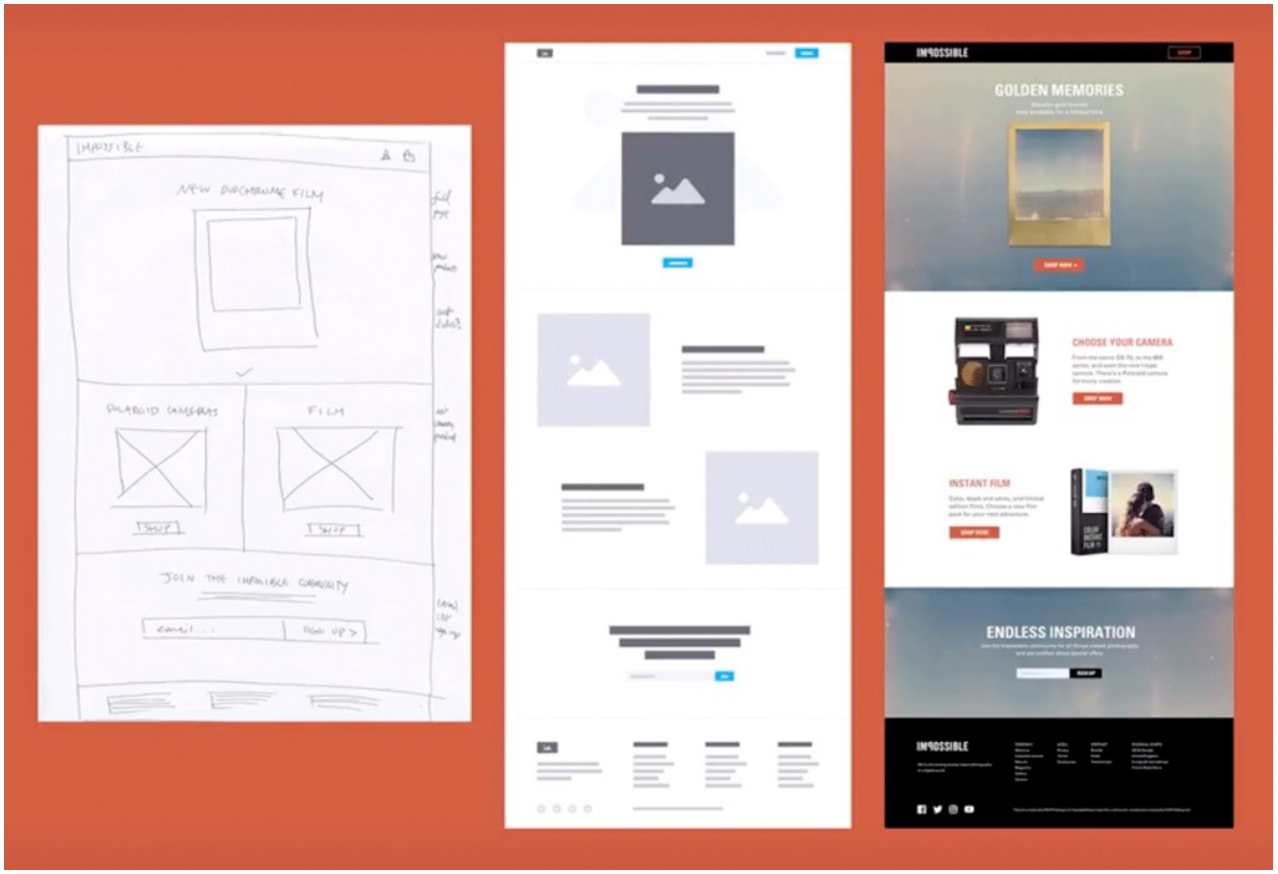
- High-fidelity wireframes should be saved for the latter stages of the product's design cycle.


Credit: careerfoundry.com

# Website wireframes vs. mobile wireframes

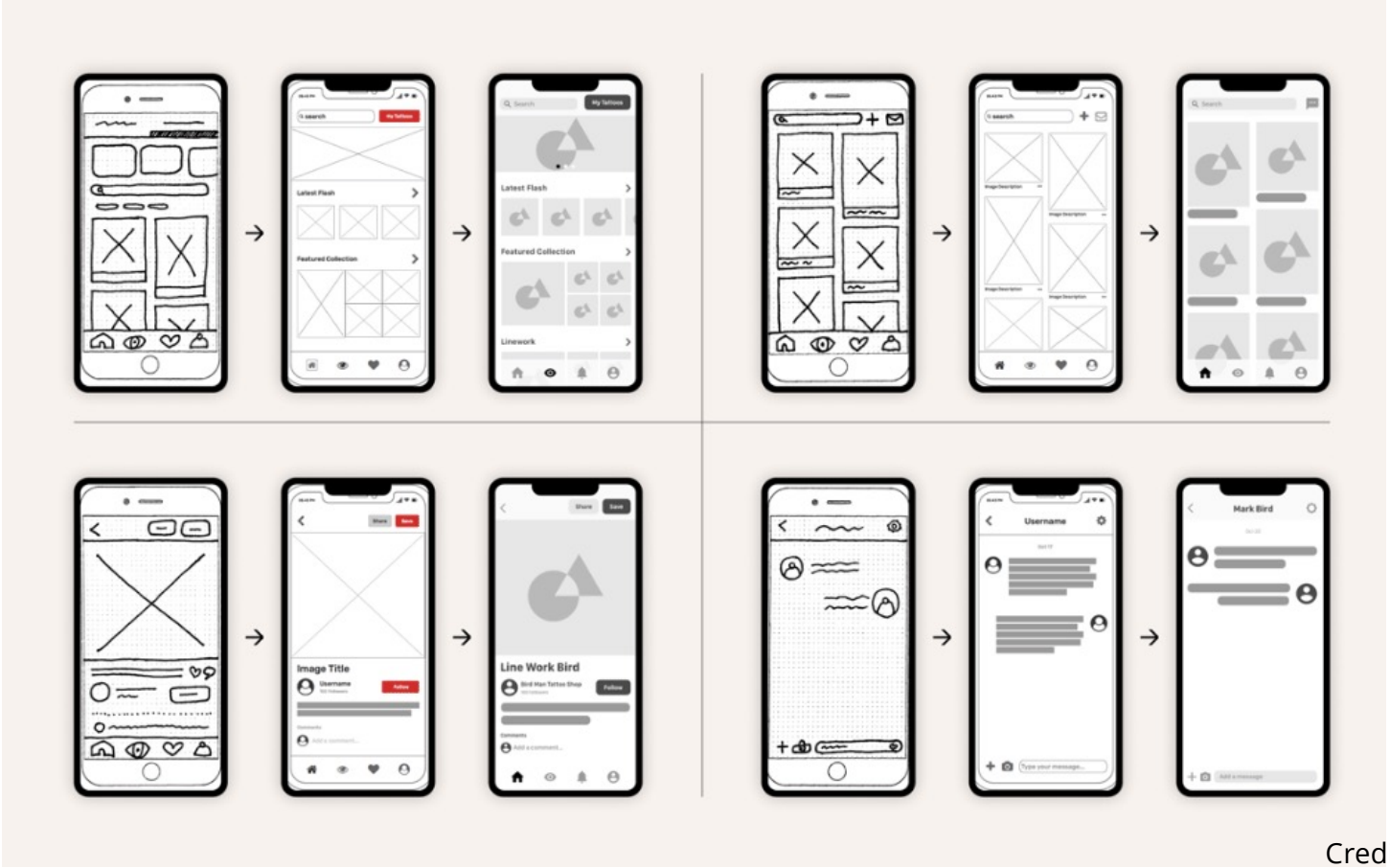
- **Size**
  - On a desktop website your website wireframe might feature a layout that spreads over multiple columns.
  - On a mobile app, the number of columns is usually restricted to one or two columns maximum.
- **Behavior**
  - On a website, the user will use a mouse or trackpad to navigate the page.
  - On a mobile app, users will have to tap the screen to open a feature.
- **Interaction**
  - Many apps also offer the user the option to download content for offline use.
  - These “offline modes” specific to mobile applications should be reflected in your wireframe.

# Examples of wireframes




Credit: Monica Galvan

# Examples of wireframes




Credit: Aaron Akbari Mort

# Practical Tips

- Be Clear About Your Objective
  - Without a clearly-stated goal, your wireframes won’t bring too much value.
- Sketch Your Ideas on Paper First
  - During the ideation phase, your goal is to bring up many ideas as possible
- Use a Properly-Sized Canvas
  - Wrong density of elements will lead to incorrect visual hierarchy, and as a result, the need to rethink the organization of elements.

cr. uxplanet.org

# Practical Tips

- Strive for Consistency
  - You can achieve consistency in design by creating reusable styles and symbols.
- Think in Terms of Flow, Not Individual Screens
  - Always think about how a particular screen will work with other screens.
    - What is the most important on this screen?
    - How are users supposed to interact with it?
    - What do they expect to see next?

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# Practical Tips

- Use Color Intentionally
  - If you plan to use color, **use it sparingly and consistently**.
  - For instance, it’s possible to use a selected color to highlight important objects.
- Make It Functional, Not Pretty
  - When you spend extra time on visual aspects of your design, you forget about the **purpose** of wireframing.

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# Practical Tips

- Don’t Get Too Attached to Your Wires
  - We must be willing to entertain change and pivot often.
- Add Annotations
  - The purpose of the annotations is to create context and make it easier for other people to understand the meaning of your design.
- Ask for Feedback
  - Get feedback early and often.

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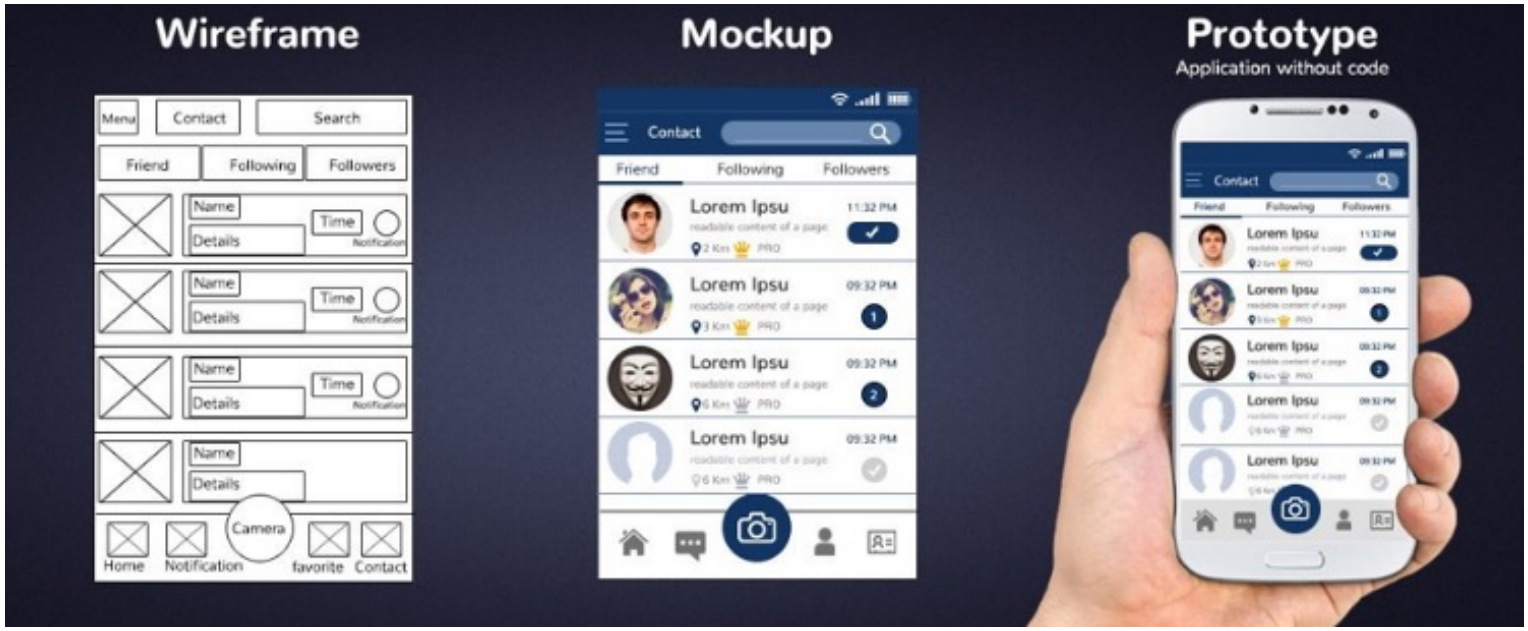
# What's The Difference Between A Wireframe, A Prototype, And A Mockup?




Credit: mockplus.com

# Mockup

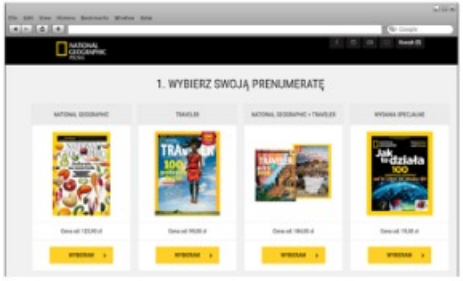
- A mockup is a static wireframe with **much more UI and visual details**.
- If a wireframe is considered as the blueprint of a building, a mockup is like a real-life building model.
- It gives viewers a more realistic impression of how the final website/app will look like.
- **It is good for communicating, discussing, collaborating and iterating projects with your team members at a later design stage.**

**WIREFRAME**

Structure + Functions + Content


**MOCKUP**

Style + Colours + Right Content



# Prototype

- To some extent, a prototype is a fully interactive, functional mockup with high-fidelity UIs, rich interactions and animations.

- It behaves and acts just like the final website/app product, S

- **It is ideal to be used to test for potential app problems before moving into the development stage.**