

User interface design

Week11: Prototyping and construction: generating prototypes, construction

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Outline

- ❖ Intended learning outcomes
- ❖ Introduction to Prototypes and Construction
- ❖ Prototyping Tools and Software
- ❖ Construction Strategies
- ❖ Generating Card-Based Prototypes

Intended learning outcomes

- ❖ Understand the role and significance of prototypes and construction in interface design.
- ❖ Learn different prototyping techniques and when to use them.
- ❖ Develop proficiency in using prototyping tools and software.
- ❖ Gain practical skills in constructing user interfaces based on design specifications.

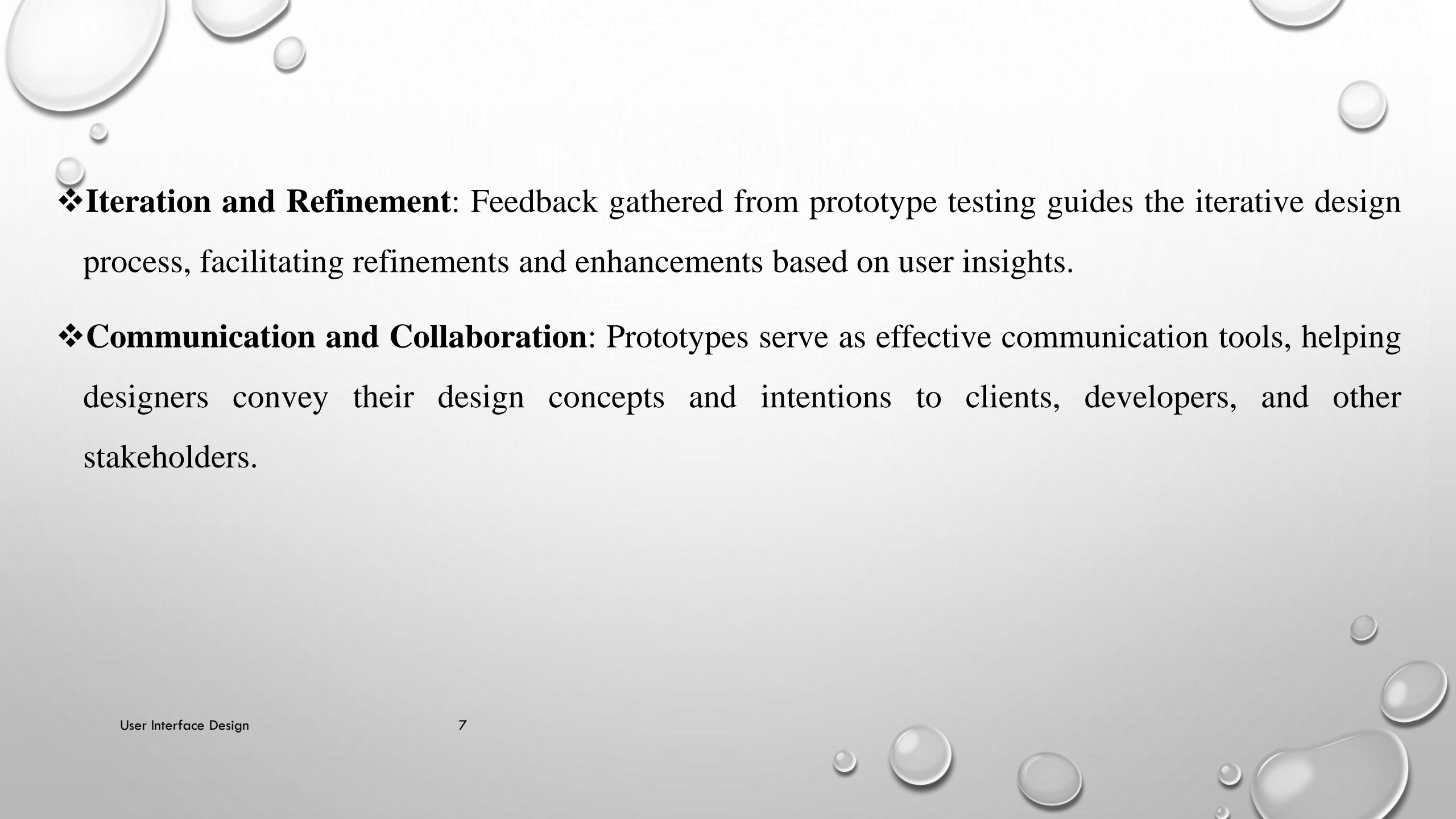
Introduction to Prototypes and Construction

- ❖ Prototypes and construction play crucial roles in interface design, allowing designers to visualize, test, and refine their designs before moving into the development phase.
- ❖ Prototyping involves creating representative models of the interface, while construction refers to the process of transforming design concepts into functional user interfaces.

- ❖ Prototypes are mockups or models that simulate the functionality and user experience of the final interface.
- ❖ They serve as tangible representations of design ideas and enable designers to gather feedback, identify usability issues, and iterate on their designs.
- ❖ Prototypes can be created at different levels of fidelity, ranging from low-fidelity sketches and wireframes to high-fidelity interactive prototypes with detailed visual and interactive elements.

Key aspects of prototypes

- ❖ **Testing Ideas:** Prototypes allow designers to test and validate their design ideas with users, stakeholders, and other team members before investing time and resources in development.
- ❖ **User Experience Evaluation:** Prototypes enable designers to assess the usability and effectiveness of the interface, identifying areas that may require improvement or modification.


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- ❖ **Iteration and Refinement:** Feedback gathered from prototype testing guides the iterative design process, facilitating refinements and enhancements based on user insights.
 - ❖ **Communication and Collaboration:** Prototypes serve as effective communication tools, helping designers convey their design concepts and intentions to clients, developers, and other stakeholders.

Construction

- ❖ Construction involves transforming design concepts and specifications into fully functional user interfaces.
- ❖ It encompasses the implementation of visual and interactive elements, adhering to design principles, guidelines, and specifications.
- ❖ During the construction phase, designers work closely with developers to ensure the accurate translation of design concepts into code.

Key aspects of construction

- ❖ **Design Implementation:** Construction involves translating visual design elements, such as color schemes, typography, and layout, into code or design assets.
- ❖ **Interactive Elements:** Construction encompasses the implementation of interactive components, such as buttons, forms, menus, and navigation elements, ensuring their proper functionality.



❖ **Responsiveness and Adaptability:** Designers ensure that the constructed interfaces are responsive and adaptable, providing optimal user experiences across different devices and screen sizes.

❖ **Usability and Accessibility:** Construction includes considering usability and accessibility principles, making the interface intuitive, user-friendly, and accessible to a diverse range of users.

Importance of prototypes and construction in the design

- ❖ **Visualizing and Testing Ideas:** Prototypes allow designers to transform abstract ideas and concepts into tangible representations.
- ❖ By creating prototypes, designers can visualize and explore different design solutions, test their viability, and evaluate their effectiveness in meeting user needs and project goals.
- ❖ **Gathering User Feedback:** Prototypes serve as valuable tools for gathering user feedback and insights.

- ❖ **Iterative Design Process:** Prototypes facilitate an iterative design process, where designers can rapidly iterate and refine their designs based on user feedback and insights.
- ❖ **Communication and Collaboration:** Prototypes serve as a common language between designers, stakeholders, and developers.
- ❖ They effectively communicate design concepts, allowing stakeholders to visualize and understand the proposed solution.

- ❖ **Risk Reduction:** Prototypes help in mitigating risks associated with design decisions. By validating design ideas through prototypes, designers can identify and address potential usability issues, usability gaps, or flaws in the user flow.
- ❖ **Construction Accuracy:** Construction plays a crucial role in translating design concepts into functional interfaces.
- ❖ By accurately implementing design elements, interactive components, and visual aesthetics, the construction phase ensures that the final product aligns with the intended design vision.

Overview of popular prototyping tools

- ❖ There are several popular prototyping tools available that facilitate the creation of interactive and high-fidelity prototypes.
- ❖ Here's an overview of some widely used prototyping tools:



❖ **Sketch:**

- ❖ Sketch is a vector-based design tool primarily used for creating user interfaces. While it is not a dedicated prototyping tool, it offers features that enable designers to create interactive prototypes.
- ❖ Sketch allows designers to create artboards, define clickable areas, and create transitions between screens.
- ❖ It also integrates with various plugins and third-party tools, enhancing its functionality for prototyping.



❖ **Figma:**

- ❖ Figma is a cloud-based design and prototyping tool that enables collaborative design workflows.
- ❖ It allows multiple designers to work simultaneously on the same project, making it suitable for team collaboration.
- ❖ Figma offers a wide range of design and prototyping features, including interactive transitions, component libraries, and real-time feedback.
- ❖ It also provides easy sharing and presentation capabilities.



❖ **Adobe XD:**

- ❖ Adobe XD is a comprehensive design and prototyping tool that enables designers to create interactive experiences.
- ❖ It offers a range of features, including artboards, interactive elements, animations, and prototyping modes.
- ❖ Adobe XD integrates seamlessly with other Adobe Creative Cloud applications, making it convenient for designers already using Adobe software.
- ❖ It also supports sharing and collaboration features.



❖ **InVision:**

- ❖ InVision is a popular prototyping and collaboration platform that allows designers to create interactive and animated prototypes.
- ❖ It offers a user-friendly interface and a wide range of features, such as screen transitions, interactive hotspots, and gestures.
- ❖ InVision also provides tools for user testing, feedback collection, and collaboration, making it suitable for team collaboration and stakeholder involvement.



❖ **Axure RP:**

- ❖ Axure RP is a robust prototyping tool that enables designers to create interactive and complex prototypes.
- ❖ It offers advanced features such as conditional logic, dynamic content, and data-driven interactions.
- ❖ Axure RP is widely used for prototyping complex web applications and enterprise-level projects.
- ❖ It also provides options for documentation and specification generation.

Considerations for choosing appropriate prototyping tools

❖ Design and Prototyping Features:

- ❖ Evaluate the tool's design and prototyping capabilities. Consider the features that are essential for your project, such as the ability to create interactive elements, define transitions, animate components, and support advanced interactions.



❖ **Ease of Use and Learning Curve:**

- ❖ Consider the tool's user interface and ease of use. Look for a tool that has an intuitive interface and a short learning curve, as this can help streamline the prototyping process and allow designers to quickly create prototypes.



❖ **Collaboration and Sharing:**

- ❖ If collaboration among team members or stakeholders is crucial, consider how the tool facilitates collaboration and sharing.
- ❖ Look for features such as real-time collaboration, versioning, commenting, and sharing capabilities.
- ❖ Assess whether the tool allows for seamless collaboration and feedback exchange within the design team and with external stakeholders.



❖ **Integration with Design Workflow:**

- ❖ Consider how the prototyping tool integrates with your existing design workflow and other design tools you use.
- ❖ Look for compatibility with design software, file formats, and design libraries.
- ❖ Integration with other tools can streamline the design process and enhance productivity.



❖ **Platform and Device Support:**

- ❖ Consider the platforms and devices you are designing for.
- ❖ Ensure that the prototyping tool supports the platforms and devices relevant to your project, such as desktop, mobile, or web.
- ❖ Assess whether the tool allows you to preview and test prototypes on different devices or provides device-specific functionalities.



❖ **User Testing and Feedback:**

- ❖ If user testing and feedback collection are important to your prototyping process, consider whether the tool offers features that facilitate user testing and feedback collection.
- ❖ Look for tools that allow you to conduct usability testing, gather user feedback, and iterate on the design based on user insights.



❖ **Pricing and Licensing:**

- ❖ Consider the pricing model and licensing options for the prototyping tool.
- ❖ Assess whether the tool offers a pricing plan that suits your budget and project needs.
- ❖ Some tools offer free versions or trial periods, allowing you to evaluate the tool before committing to a paid subscription.



❖ **Support and Updates:**

- ❖ Evaluate the support and updates provided by the tool's developers.
- ❖ Look for responsive customer support, online forums, and regular software updates.
- ❖ A tool with active support and updates ensures that you receive assistance when needed and that the tool stays up-to-date with the latest features and improvements.

Construction Strategies

- ❖ Construction strategies encompass a range of approaches and methodologies used in the construction industry to efficiently plan, execute, and complete construction projects.
- ❖ These strategies help optimize resources, manage risks, and ensure the successful delivery of projects.

Understanding design specifications and requirements.

- ❖ Design specifications and requirements are essential components of the design process.
- ❖ They provide a clear and detailed description of what needs to be achieved in a design project and serve as a guide for designers and stakeholders.
- ❖ Let's explore the concepts of design specifications and requirements:



❖ **Design Specifications:**

- ❖ Design specifications are detailed descriptions of the desired characteristics, functionalities, and constraints of a design project.
- ❖ They outline the specific requirements that the design must meet.
- ❖ Design specifications can cover various aspects of the project, including visual design, user experience, functionality, performance, and technical considerations.
- ❖ Here are some key points to consider:

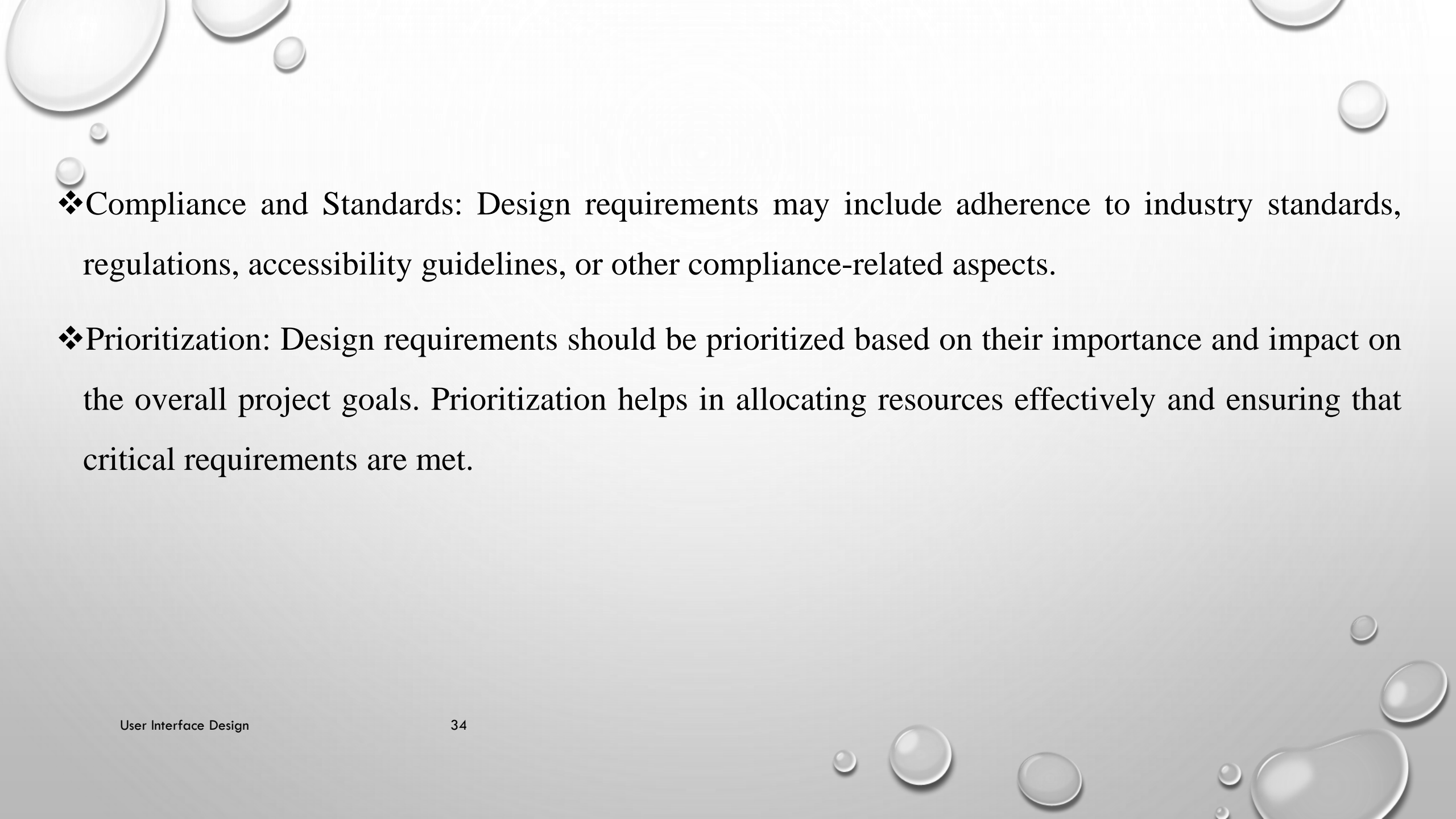
- ❖ **Clear and Specific:** Design specifications should be clear, concise, and specific, leaving no room for ambiguity.
- ❖ **Measurable Criteria:** Design specifications often include measurable criteria or metrics that can be used to evaluate the design's success.
- ❖ **Stakeholder Input:** Design specifications should incorporate input and feedback from stakeholders, including clients, users, and other relevant parties.



❖ **Design Requirements:**

- ❖ Design requirements are the functional and non-functional criteria that the design must fulfill.
- ❖ They are derived from the project's goals, user needs, and business objectives.
- ❖ Design requirements provide a roadmap for the design team and help ensure that the design meets the desired outcomes.
- ❖ Consider the following aspects:

- ❖ **User Needs:** Design requirements should address the needs and expectations of the target users.
- ❖ **Business Objectives:** Design requirements should align with the business objectives and goals of the project.
- ❖ **Technical Considerations:** Design requirements may encompass technical considerations, such as platform compatibility, performance requirements, security measures, or integration with existing systems.

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- ❖ **Compliance and Standards:** Design requirements may include adherence to industry standards, regulations, accessibility guidelines, or other compliance-related aspects.
 - ❖ **Prioritization:** Design requirements should be prioritized based on their importance and impact on the overall project goals. Prioritization helps in allocating resources effectively and ensuring that critical requirements are met.

Translating design concepts into functional user interfaces

- ❖ Translating design concepts into functional user interfaces involves the process of turning design ideas, wireframes, or prototypes into interactive and usable interfaces.
- ❖ Here are the key steps to follow:
- ❖ **Understand the Design Concept:**
- ❖ Thoroughly review the design concept, including wireframes, mockups, or prototypes. Understand the intended user experience, visual aesthetics, and how different elements are meant to interact with each other.



❖ **Identify Key Design Elements:**

❖ Identify the key design elements such as navigation menus, buttons, forms, content sections, and interactive components.

❖ **Convert Visual Designs into Code:**

❖ If you're working with visual designs created in design tools, convert them into code using appropriate front-end development technologies such as HTML, CSS, and JavaScript.



❖ **Implement Interaction and Behavior:**

❖ Add interactivity and behavior to the user interface elements. Implement transitions, animations, hover effects, and any other dynamic behavior specified in the design.

❖ **Handle User Input and Validation:**

❖ Implement functionality to handle user input, such as form submission, data validation, and error handling. Ensure that user interactions and input are handled appropriately, providing feedback and guidance as necessary.

❖ **Responsiveness and Compatibility:**

- ❖ Ensure that the user interface is responsive and compatible with different devices and screen sizes.

Use responsive design techniques and test the interface across various devices and browsers to ensure a consistent and optimized experience.

❖ **Test and Refine:**

- ❖ Thoroughly test the functional user interface to identify and fix any usability issues, bugs, or inconsistencies. Conduct user testing or gather feedback from stakeholders to validate the interface's effectiveness and make necessary refinements.

Implementing visual and interactive elements

- ❖ Implementing visual and interactive elements involves translating design concepts into actual code and functionality.
- ❖ Here are the key steps to consider when implementing visual and interactive elements in an interface:
- ❖ **HTML Structure:**
- ❖ Start by creating the HTML structure of the interface. Use semantic HTML tags to define the different sections and elements of the interface.



❖ **Cascading Style Sheets (CSS):**

❖ Apply CSS styles to control the visual appearance of the interface. Use CSS rules to define typography, colors, spacing, layout, and other visual properties.

❖ **Visual Elements:**

❖ Implement visual elements such as headers, paragraphs, images, icons, buttons, and forms using HTML and CSS. Pay attention to spacing, alignment, typography, and color to achieve the desired visual aesthetics.

❖ **Responsive Design:**

❖ Design the interface to be responsive, ensuring that it adapts and displays appropriately on different devices and screen sizes.

❖ **Interactive Elements:**

❖ Implement interactive elements such as buttons, links, menus, dropdowns, tabs, accordions, and modals using HTML, CSS, and JavaScript. Apply JavaScript event handlers to enable user interactions and trigger the desired functionality.



❖ **User Feedback and Validation:**

- ❖ Implement user feedback mechanisms, such as showing success messages, error messages, or loading spinners, to provide feedback on user actions and system status.

❖ **Accessibility Considerations:**

- ❖ Ensure that the interface is accessible to users with disabilities. Follow accessibility guidelines, such as providing alternative text for images, using ARIA attributes for interactive elements, and ensuring proper color contrast.

Collaborating with Developers

- ❖ Collaboration between designers and developers is crucial to ensure a smooth transition from the design phase to the development phase.
- ❖ Effective communication and understanding between these two teams contribute significantly to the success of a project.
- ❖ Here are some key aspects to consider when collaborating with developers in the context of interface design:



❖ **Clear Communication:**

- ❖ **Use a Common Language:** Ensure that both designers and developers understand and use a common set of terms and concepts to avoid misunderstandings.
- ❖ **Regular Meetings:** Schedule regular meetings to discuss progress, address concerns, and share updates.



❖ **Design Handoff:**

- ❖ **Use Prototyping Tools:** Utilize prototyping tools that allow for easy design handoff, providing developers with assets, specifications, and code snippets.
- ❖ **Provide Documentation:** Create detailed design documentation that includes style guides, component libraries, and interaction guidelines.



❖ **Responsive Collaboration:**

❖ **Involve Developers Early:** Include developers in the design process from the early stages to gather their input and ensure feasibility.

❖ **Design System Implementation:**

❖ **Design Systems:** Develop and maintain a design system that includes reusable components, styles, and guidelines for a consistent user interface.

❖ **Version Control:**

❖ **Use Version Control Systems:** Implement version control systems for both design and code to track changes, collaborate efficiently, and manage updates.

❖ **Accessibility and Performance:**

❖ **Consideration for Accessibility:** Collaborate on making the design accessible, ensuring that the user interface is usable by individuals with disabilities.

❖ **Optimize for Performance:** Work together to optimize assets and code for better performance.



❖ **Continuous Feedback:**

- ❖ **Iterative Approach:** Encourage an iterative approach where designers and developers work together to refine the product based on user feedback and testing.
- ❖ **Regular Check-ins:** Schedule regular check-ins to discuss progress, address roadblocks, and refine the design as needed.



❖ **Problem Solving:**

- ❖ **Joint Problem Solving:** When challenges arise, encourage joint problem-solving sessions to find optimal solutions that balance design intent and technical feasibility.
- ❖ **Empathy:** Foster empathy between designers and developers, helping each team understand the constraints and goals of the other.



❖ **Knowledge Sharing:**

- ❖ **Cross-Training Opportunities:** Provide opportunities for cross-training, allowing designers to understand development processes and developers to gain insights into design principles.
- ❖ **Knowledge Transfer Sessions:** Organize knowledge transfer sessions where designers and developers share their expertise with each other.



❖ **Celebrate Successes:**

- ❖ **Acknowledge Achievements:** Celebrate successful milestones, recognizing the collaborative effort of both design and development teams.
- ❖ **Continuous Improvement:** Use post-project reviews to identify areas for improvement in collaboration processes.

Generating Card-Based Prototypes

- ❖ Card-based prototypes are commonly used to capture and explore elements of an interaction, such as dialogue exchanges between the user and the product (Yvonne Rogers, 2023).
- ❖ The value of this kind of prototype lies in the fact that the interaction elements can be manipulated and moved around in order to simulate interaction or to explore a user's end-to-end experience.
- ❖ This may be done as part of the evaluation or in conversations within the design team.

- ❖ To generate a card based prototype, we are going to use adobe experience design (XD).
- ❖ Adobe XD is a vector-based professional graphic tool that allows us to design the seamless user interface and their interactive prototypes.
- ❖ It helps us craft designs that look and feel like real interactable components. We can maintain a seamless flow across the designs.
- ❖ It provides several peerless features that make the designing process smoother than the other tools. It provides every required feature from designing to assets delivery.

How to Download Adobe XD

- ❖ To download the Adobe XD, visit [Adobe](#). XD is available for free and premium plans; select your choice accordingly.
- ❖ And follow the details about the downloads

How to Install Adobe XD?

- ❖ Step1: Run the installer file
- ❖ Step2: Select the language and location
- ❖ Step3: Wait for the download

- ❖ To generate card-board prototypes in Adobe XD, you can use the following steps:
- ❖ Create a new XD document or open an existing document.
- ❖ Draw the outline of your card-board prototype on the canvas.
- ❖ Use the Shape Builder tool to add details to your prototype, such as folds, tabs, and slots.
- ❖ Use the Fill and Stroke tools to add color and texture to your prototype.

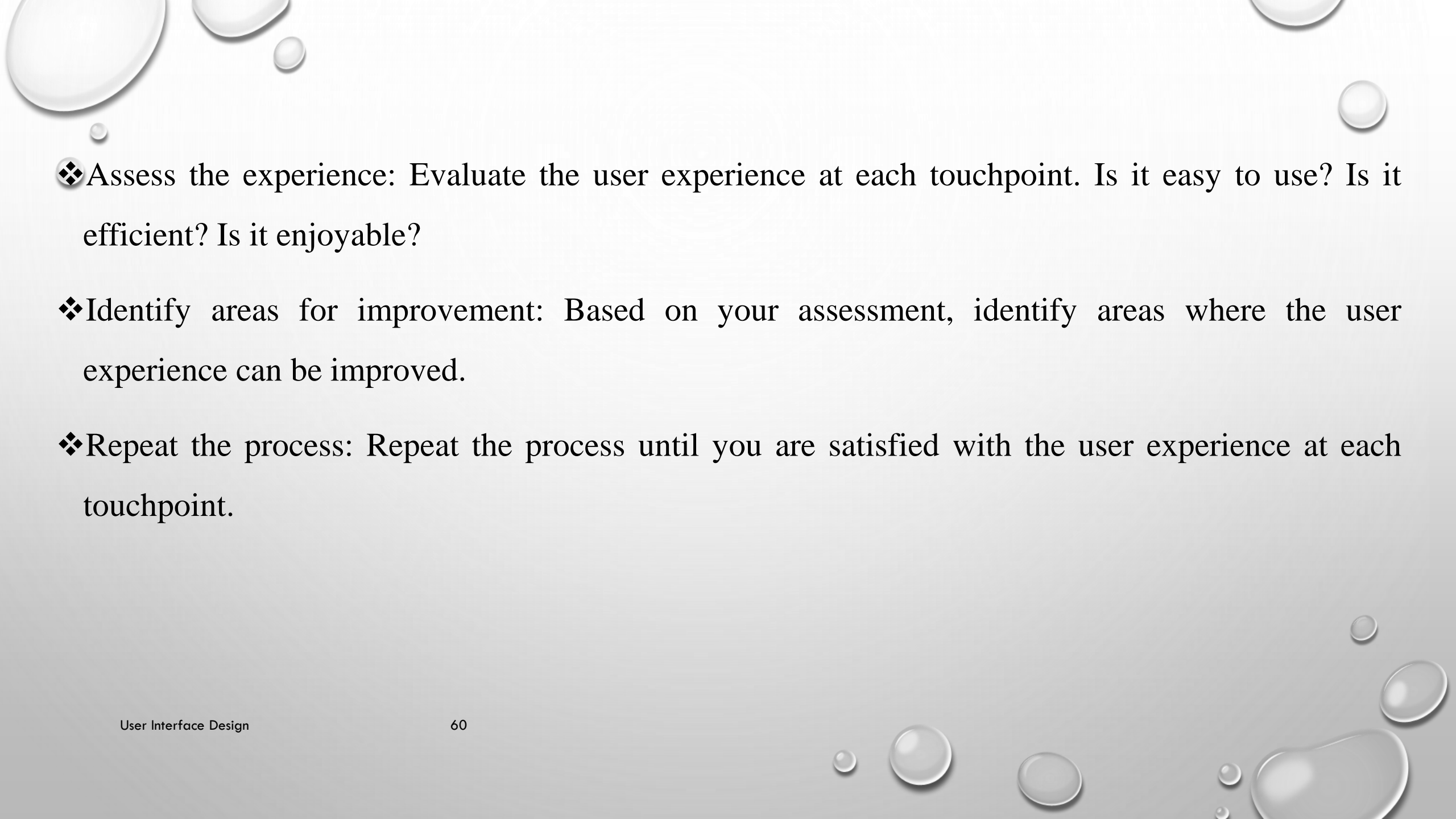
- ❖ Once you are finished creating your prototype, you can export it as a PDF or SVG file.
- ❖ To print your prototype, open the PDF or SVG file in a printer-friendly program, such as Adobe Acrobat or Inkscape.
- ❖ Scale your prototype to the desired size and print it out on card-board.
- ❖ Once the prototype is printed out, you can cut it out and assemble it.

Mapping the Overall Experience

- ❖ Mapping the overall experience in prototyping is a process of identifying and understanding all of the different touchpoints that a user will have with your product or service throughout their journey.
- ❖ By mapping the overall experience in prototyping, you can identify areas where your product or service can be improved, and you can ensure that the user experience is consistent and seamless across all touchpoints UXPressia(2022).

Steps for mapping the overall experience in prototyping

- ❖ Identify your user personas: Who is your target user? What are their goals, needs, and pain points?
- ❖ Map out the user journey: What steps does the user take to achieve their goal with your product or service?
- ❖ Identify the touchpoints: What are all of the different ways that the user will interact with your product or service?

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- ❖ **Assess the experience:** Evaluate the user experience at each touchpoint. Is it easy to use? Is it efficient? Is it enjoyable?
 - ❖ **Identify areas for improvement:** Based on your assessment, identify areas where the user experience can be improved.
 - ❖ **Repeat the process:** Repeat the process until you are satisfied with the user experience at each touchpoint.

References

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- ❖ UXPressia Blog(2022). How to create prototypes with user journey maps.
<https://uxpressia.com/blog/how-to-create-prototypes-with-user-journey-maps>.



Thank you

Next Lecture We Shall Look At

Practice of Interface Design