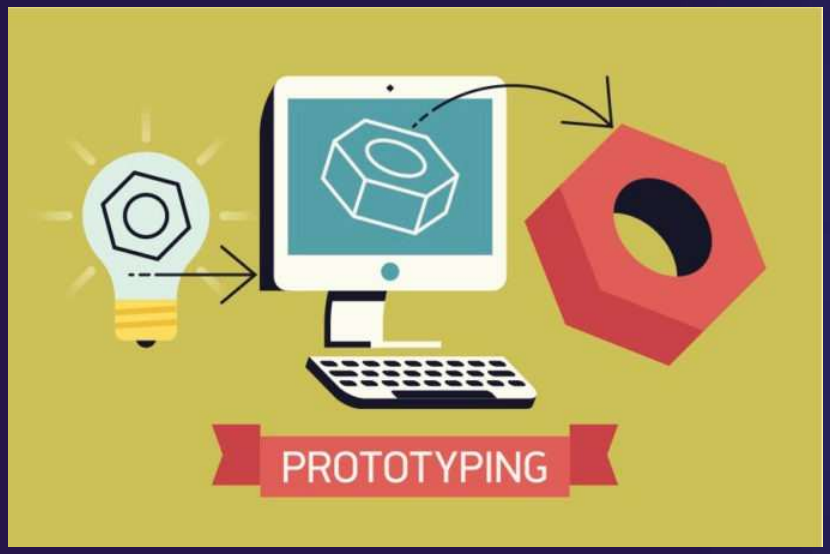
Prototyping of application

Lecture 05

Prototyping

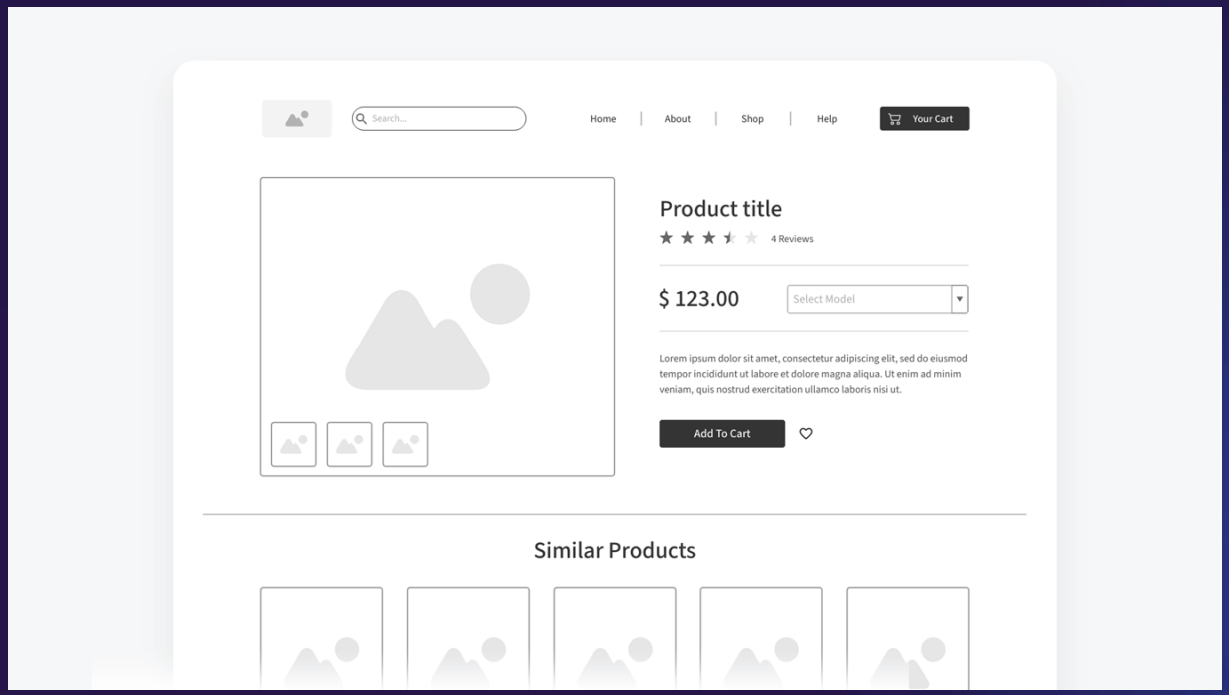
- The analyst wants to understand what exists now and what is needed
- The developer wants to create what never was



What is a Prototype ?

- **Definition**
  - A prototype is a draft version of a product
  - It is used to test ideas, gather feedback and refine designs before final development
- **Examples**
  - Wireframe of a website or mobile app
  - Physical product prototype like a car design
- **Use Cases**
  - Prototypes are valuable in the development process
  - Prototypes help identify design issues early, saving time and cost in the long run

Prototype example – Website wireframe



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Prototype example – Mobile app wireframe

Fig 1. Home screen

Fig 2. Food places

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Why build a Website Prototype ?

- **Benefits:**
  - ***Clarify:*** A prototype helps clarify what features and content are needed
  - ***Focus:*** It allows teams to focus on functionality and layout without distractions
  - ***Adjust:*** Prototypes are easy to change, allowing for quick adjustments based on feedback
  - ***Iterate:*** The iterative process improves the final product by refining features step by step
- **Example:**
  - Airbnb or Uber
- **User Role:**
  - Prototypes help users and stakeholders get involved early in the design process.

The purpose of initial prototype

- **Functionality:** The initial prototype tests whether key functions of the system work as expected.
- **Visual Design:** Only basic visual elements like structure and hierarchy are shown; it's not the final design.
- **Content:** The prototype includes essential content elements without full details.
- **Goal:** The initial prototype is to test core ideas and make sure the project is on the right track.

Example: A login page with basic fields, but without final colors or styling

Prototyping – User Interaction

- **Interaction:** Prototypes allow users to interact with the design, making it easier to gather practical feedback on usability and functionality.
- **Client Feedback: C**lient feedback could dramatically changed a real-world project.

Example: A feature was added or removed based on early feedback.

- **Role of User Testing:** User testing is an essential part of the feedback process. Through user testing, the team can identify navigation issues or confusing design elements

Prototype's fidelity

- **Types:**
  - **Low-Fidelity:** A low-fidelity prototype uses basic sketches or wireframes to show layout and functionality, without full interaction
  - **High-Fidelity:** A high-fidelity prototype looks almost like the final product, allowing for user interactions such as clicking and typing
- **Usage:**
  - **Low-fidelity:** Used in early stages for brainstorming and idea validation.
  - **High-fidelity:** Used later to refine design and test user interactions before development.

Low-Fidelity Prototyping

1. **Step-by-step breakdown:**
   - Step 1: Start with a rough sketch on paper or in a tool.
   - Step 2: Outline major components like buttons, menus, and forms.
   - Step 3: Show the basic flow from one screen to the next.
2. **Use Case:**
   - There are some situations where low-fidelity prototypes were particularly useful, such as in early brainstorming sessions.

Low-Fidelity Prototyping

https://www.youtube.com/watch?v=JMjozqJS44M

High-Fidelity Prototyping

- **Creation Tools:**
  - Many tools used to create high-fidelity prototypes

  Example: Figma, Adobe XD, Sketch
- **Interactivity:**
  - The kind of interactions you can include

  Example: drag-and-drop features or animations
- **Real-World Example:**
  - Facebook's early UI mockups

How to wireframe a website ?

https://www.youtube.com/watch?v=PmmQjLqJQIY

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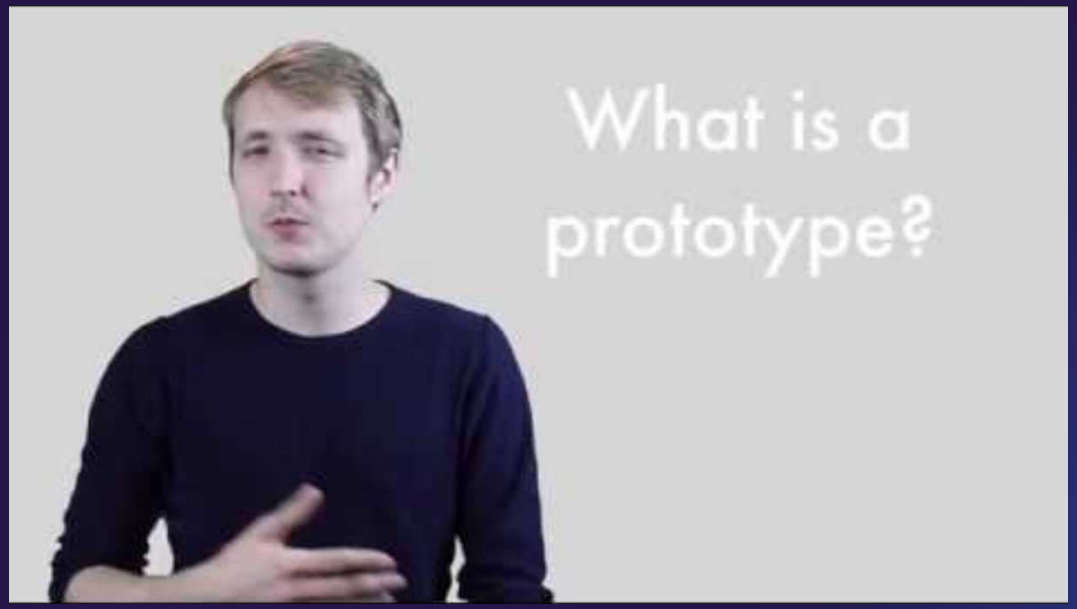
Difference between a Wireframe and a Prototype



https://www.youtube.com/watch?v=SRo9rYMG_HA

Difference between a Wireframe and a Prototype

- A wireframe is a simple layout showing structure and placement of key elements, whereas, a prototype is more interactive, showing how the final product will behave.
- Wireframe is not a prototype, wireframes are only a means to a prototype.
- Wireframes are paper based, can be drawing or sketches that show the flow/structure of the your website.

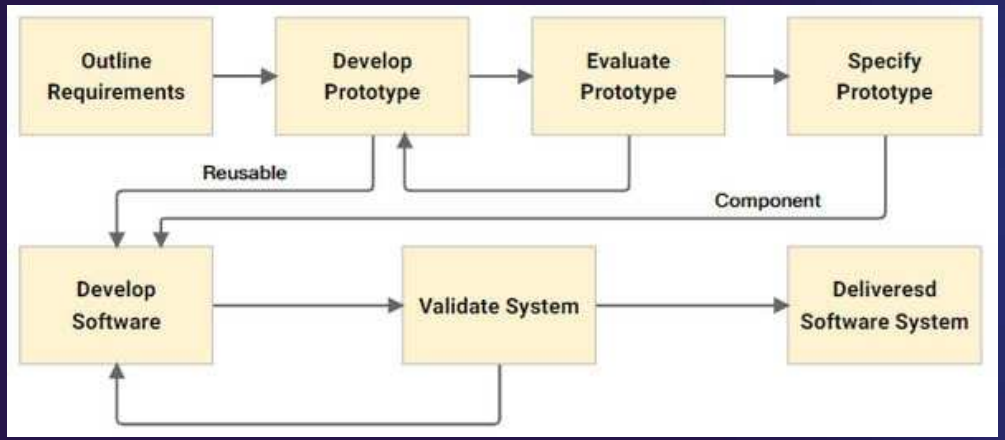
Example: Developers tend to use wireframes to better understand the core functionality of a website or app, whereas designers may use them to show the navigation flow between site screens.

Types of Prototyping Model

- **Throwaway Prototyping**: A prototype is quickly built and discarded once feedback is gathered.
- **Evolutionary Prototyping:** A prototype evolves through continuous iterations until it becomes the final product.
- **Incremental Prototyping:** Different components are prototyped separately and later integrated into the final system.

Throwaway Prototyping

- **Overview of process:**
  - Developers create a quick, simplified version of a system. This version is shown to users for feedback.
  - Afterward, the prototype is discarded, and lessons learned are incorporated into the next design.

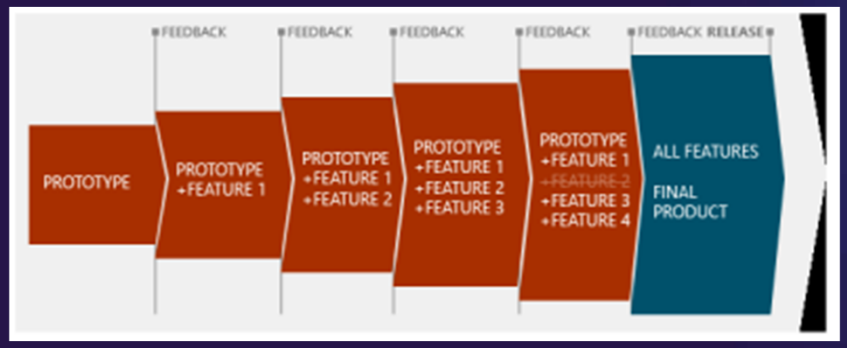


Throwaway Prototyping

- **Detail of process:**
  - Develop working model of various parts/aspects of the system at a very early stage
  - A small part of the system is developed and then given to user to try out and evaluate
  - User provides feedback which can quickly be incorporated into the development of the main system
  - Model becomes the starting point for users to re-examine expectations and clarify their requirements and system scope
  - Once achieved the prototype may be 'thrown away‘

Evolutionary Prototyping (Agile)

- **Agile Evolution:** The prototype is constantly improved through sprints, with each iteration building on the previous one.
- **How Feedback is Used:** Each sprint collects user feedback, which is used to make the next version better.
- **Real-World Example:** A software app that used Agile evolutionary prototyping successfully is Slack.



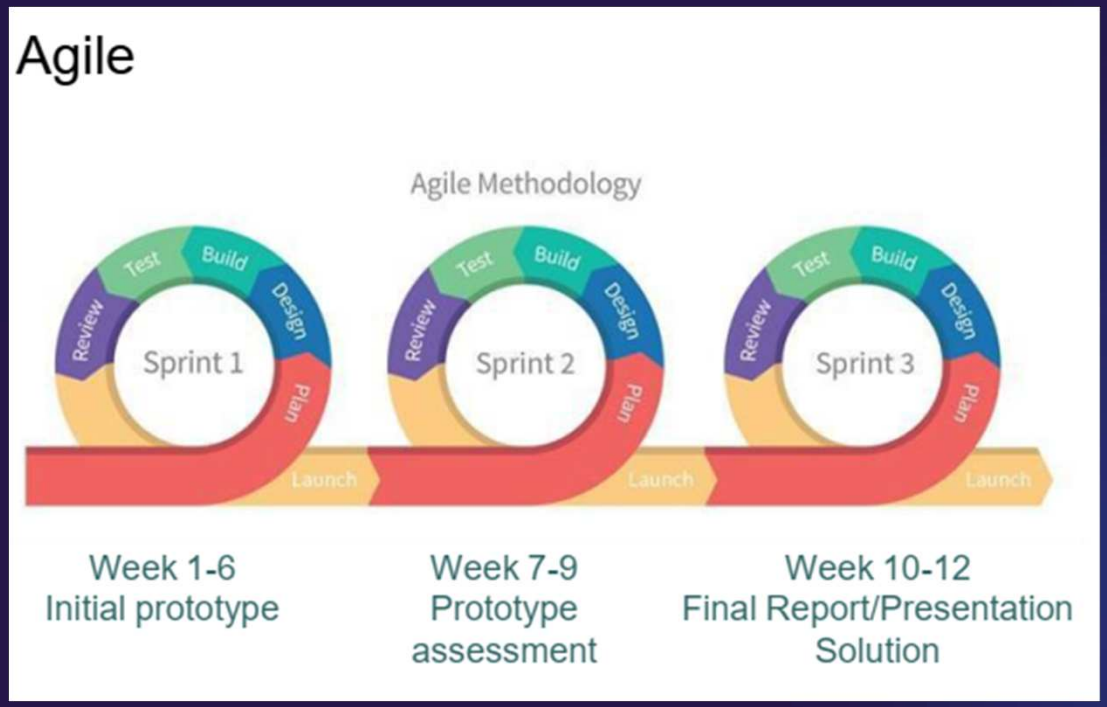
Evolutionary Prototyping Model

1. The new system requirements are defined in as much detail as possible. This usually involves interviewing a number of users representing all the departments or aspects of the existing system.
2. A preliminary design is created for the new system.
3. A first prototype of the new system is constructed from the preliminary design. This is usually a scaled-down system, and represents an approximation of the characteristics of the final product.
4. The users thoroughly evaluate the first prototype, noting its strengths and weaknesses, what needs to be added, and what should to be removed. The developer collects and analyses the remarks from the users

Evolutionary Prototyping Model

5. The first prototype is modified, based on the comments supplied by the users, and a second prototype of the new system is constructed.
6. The second prototype is evaluated in the same manner as was the first prototype.
7. The preceding steps are iterated as many times as necessary, until the users are satisfied that the prototype represents the final product desired.
8. The final system is constructed, based on the final prototype.
9. The final system is thoroughly evaluated and tested. Routine maintenance is carried out on a continuing basis to prevent large-scale failures and to minimize downtime.

Agile Methodology



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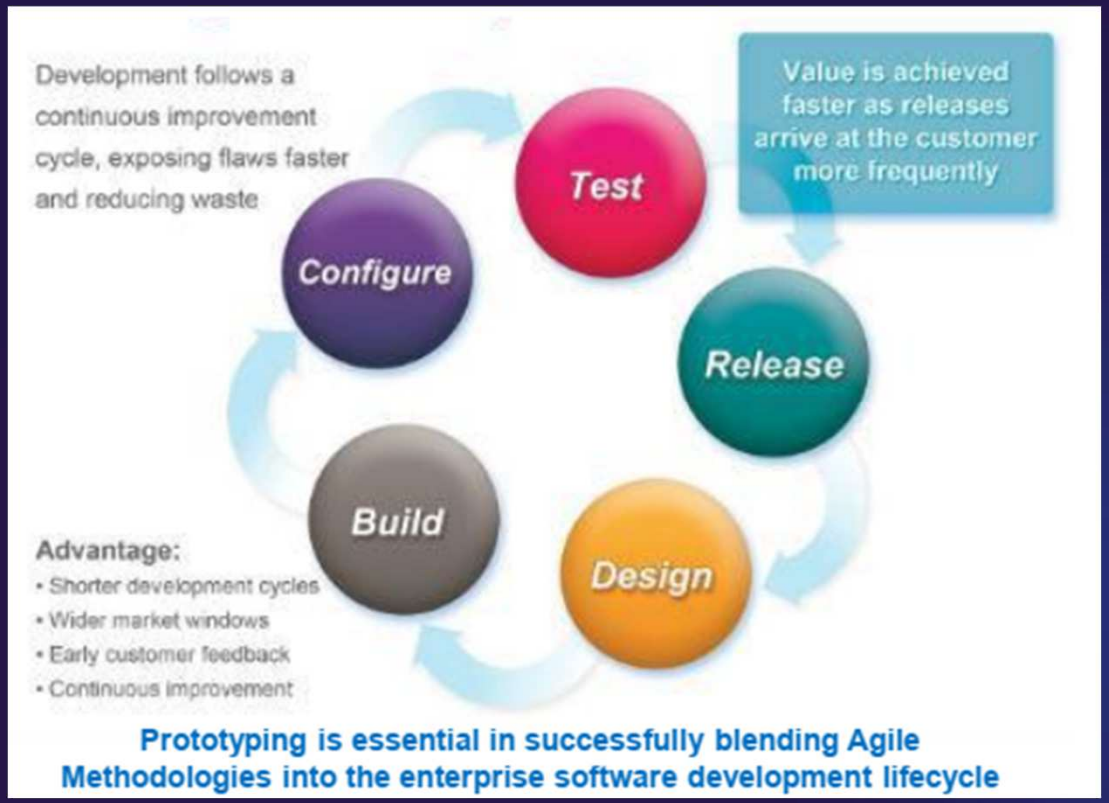
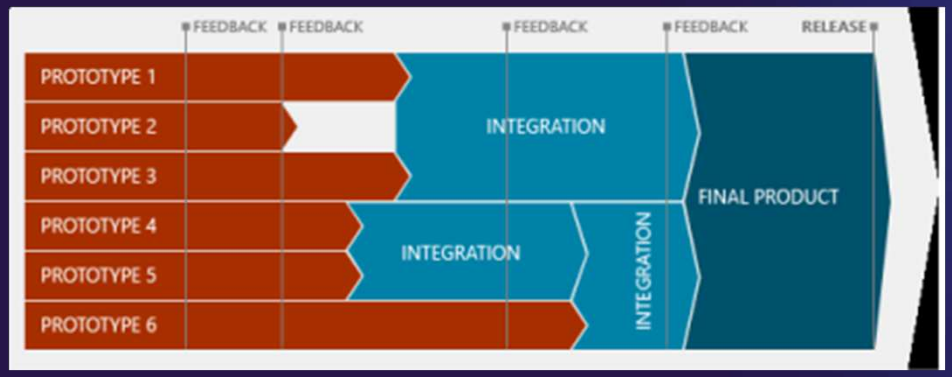
Agile Development Process



Prototyping is essential in successfully blending Agile Methodologies into the enterprise software development lifecycle

Incremental Prototyping

- **Step-by-Step:**
  - First, the system is broken into components
  - Next, each component is prototyped separately
  - Finally, the components are integrated into a single system
- Incremental prototyping was used frequently in the development of a large-scale software application.



Important questions about prototypes

- **Q:** What is the site supposed to accomplish ?
- **A:** *The site aims to increase user engagement by improving navigation.*

- **Q:** What elements should be on which page ?
- **A:** *The homepage will have a search bar, while the contact page will include a form.*

Initial prototype & Feedback

- It is a preliminary design
- **Feedback Cycle:** After building the first prototype, feedback is gathered from users, which leads to revisions.
- **Real Example:** A homepage might change after the first round of feedback (e.g., simplifying navigation or changing the color scheme).

THANK YOU