UX Verification and Validation

Embedded Interface Design

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Learning Objectives

Students will be able to…

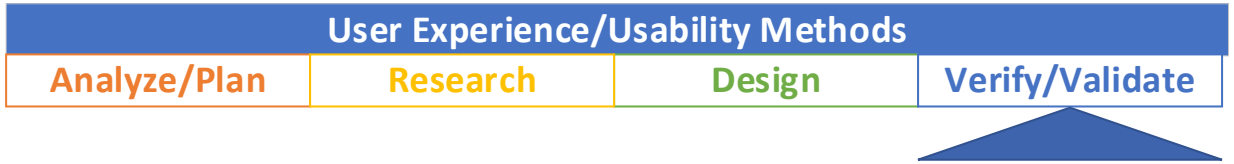
- Understand the importance of the UX verify and validate phase
- Consider the number of users to test with
- Apply methods for strengthening tests
- Understand the need for “Thinking Aloud” during testing

Verify and Validate

Verification: The process of establishing the truth, accuracy, or validity of something [1]

Validation: The action of making or declaring something legally or officially acceptable [2]

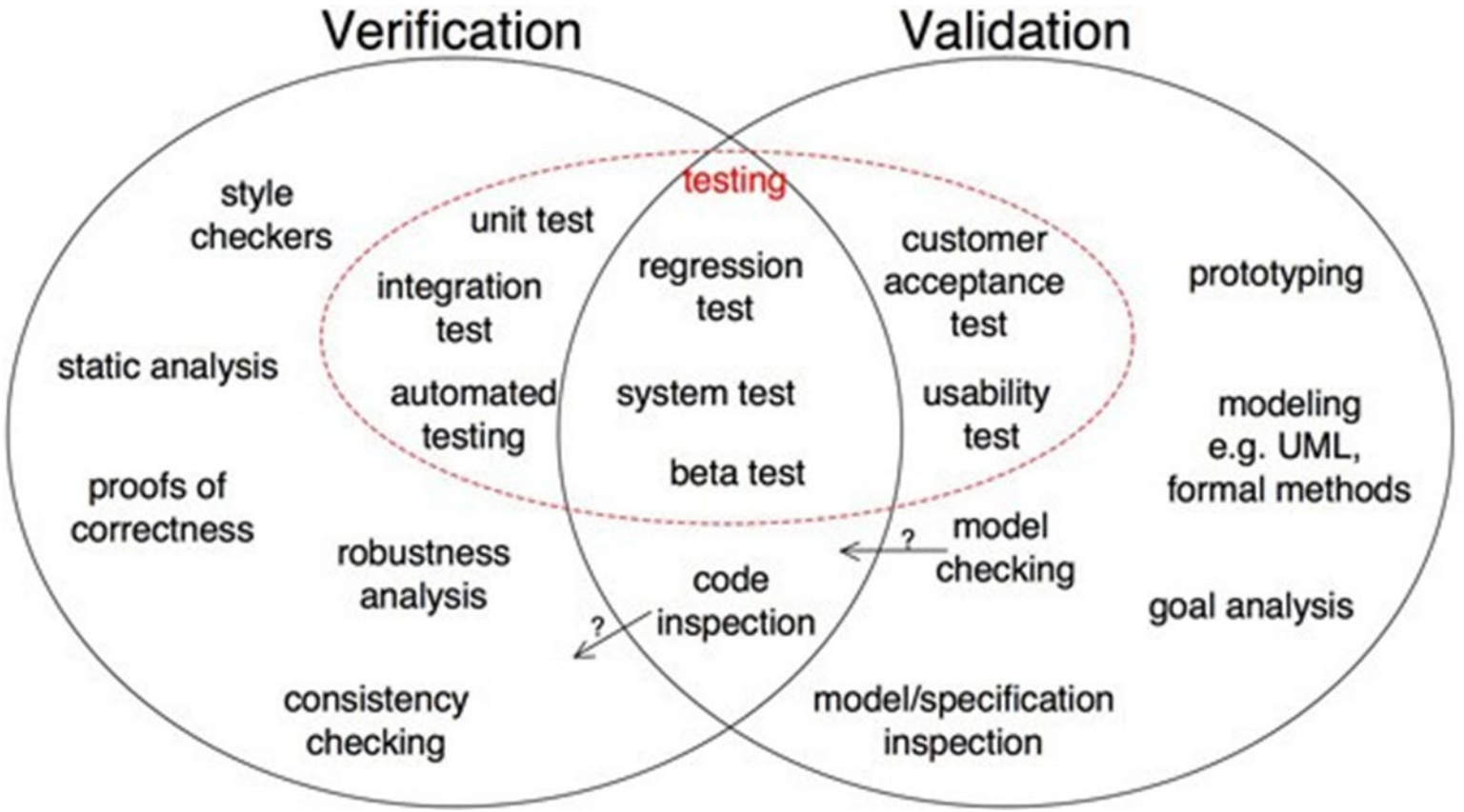
“There are three responses to a piece of design – yes, no, and WOW! Wow is the one to aim for.”—Milton Glaser



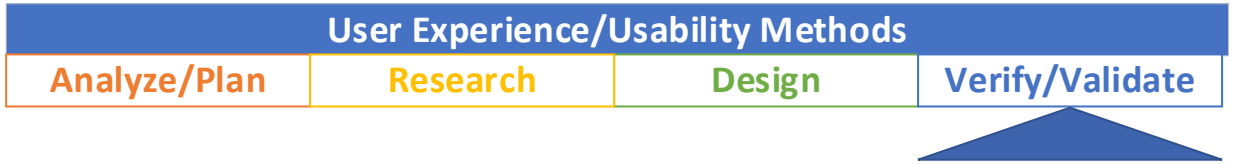
UX Verification and Validation

- Verification vs. Validation
- Why?
- In the “V”
- Testing with users: consideration, number of users
- Strengthening tests
- Encouraging “Thinking Aloud”

Verification vs. Validation



- Often hard to differentiate terms
- Verification – Does it work as it was designed? (Engineering requirements)
- Validation – Does it work as expected? (User requirements)
- Reference [3]

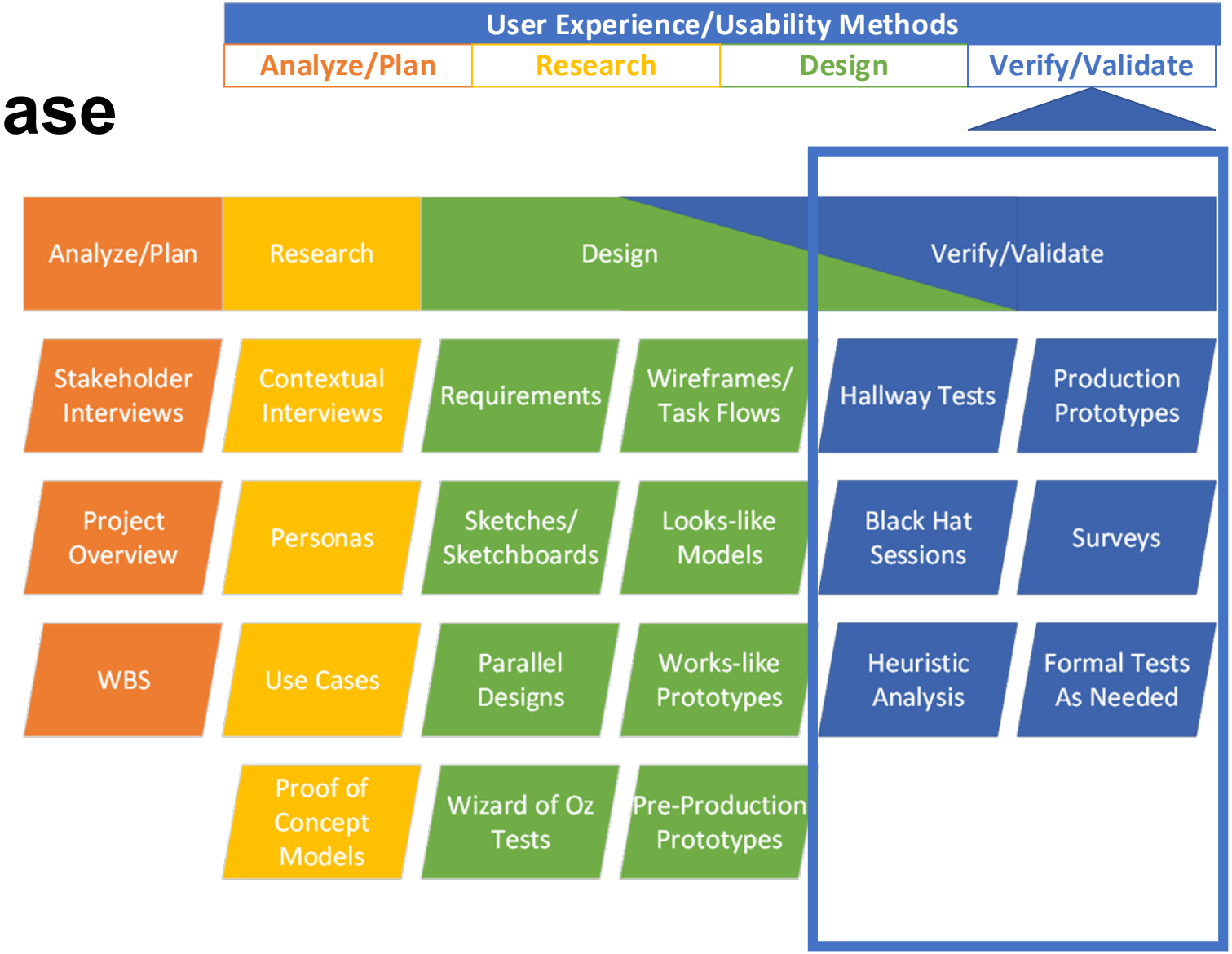


UX Verify/Validate: Why?

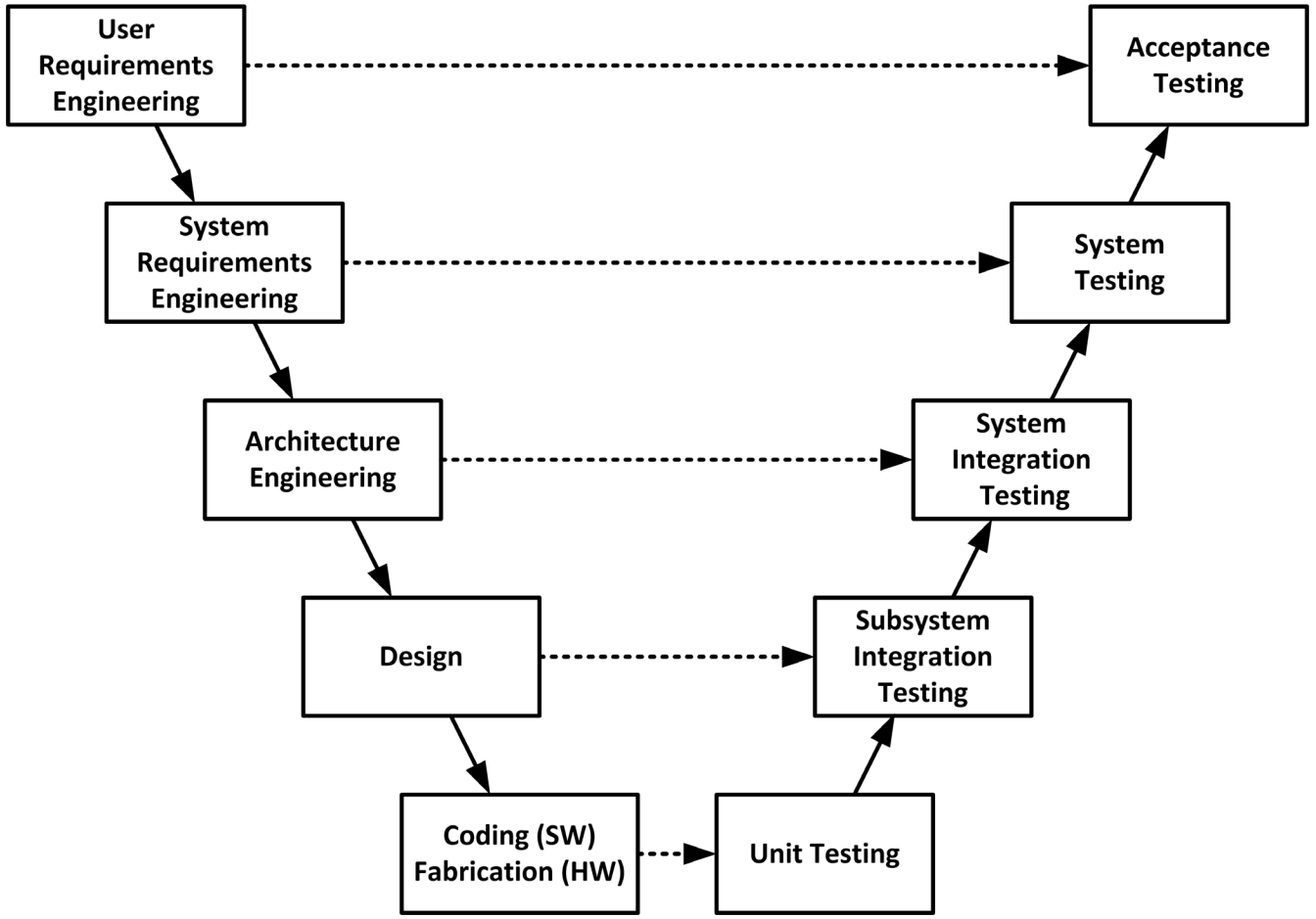
- In UX Design, we've iterated through creating a design based on our requirements and understanding of the user, and with the user's involvement
- We've also progressively elaborated that design to the point that we believe we have a useful and usable product
- This phase is for verifying the product works the way it should, and validating it against the user's acceptance
- At this point, we have to consider each issue we find as to whether it requires a change; ideally, we are not making significant design modifications

UX Verify/Validate Phase

Per our phased approach, we'll focus now on making sure what we did meets requirements and expectations; any design change we make will be carefully considered



The other side of the “V”



- In this phase, we’re on the other side of the design phase’s Requirements V Diagram, moving through test cycles
- Engineering and test teams perform unit and integration tests
- System and acceptance testing are best validated with users
- Reference [4]

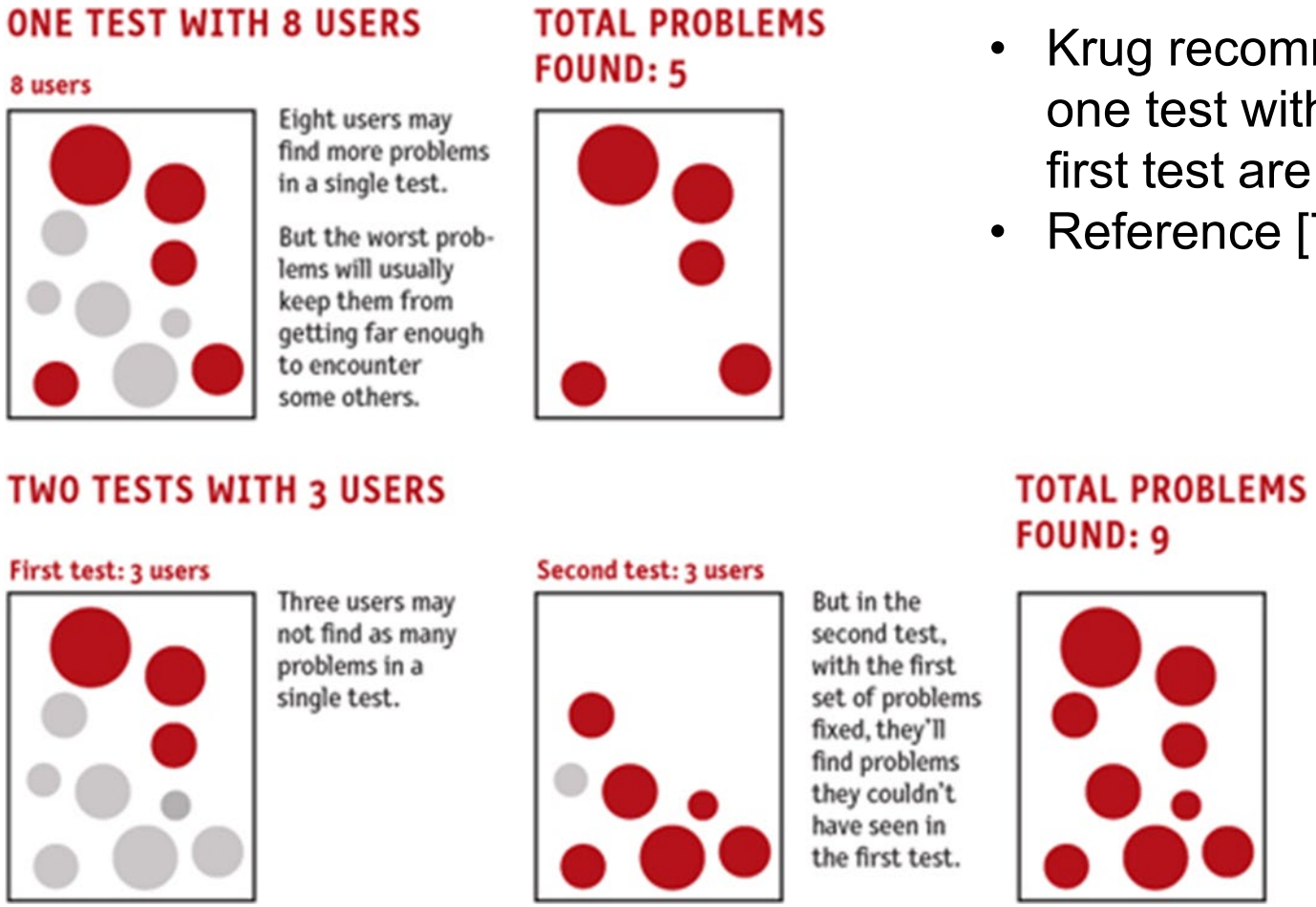
Testing with Users

- Misconception: testing with users must take time and effort
- Any approach that validates designs with real people is useful
- More about the entire UX, emotion, fluidity, fit to user mental models
- Not just usability testing, i.e. can the device be used without error
- Reference [5]

How to Run a UX Test - Stanford

- Have a plan for what you're testing; use realistic tasks for realistic scenarios
- Introduce what you expect the user to do
- Do not introduce yourself as the designer
- Always blame the prototype, not the user
- Observe quietly; ask open questions and lots of "Why?"
- Don't lead the user or ask leading questions
- Ask about this test, not another hypothetical situation
- Ask the user to think for their situation, not for others
- Stay neutral and encourage thinking aloud
- Try to understand what was expected vs. what actually happened
- Reference [6]

Number of Users for a Test - Krug



- Krug recommends two tests with three users over one test with eight (if the worst problems from the first test are fixed)
- Reference [7]

Number of Users for a Test

- Nielsen recommends five users for most usability tests – claim is five users will discover most significant issues
- This is different for more quantitative studies which will have sample sizes based on statistical significance of results – will lead to 20, 30, or more users
- There's benefit from very low overhead testing with just two users for the most obvious issues
- Most UX testing in industry is done using an average of 11 or more participants
- Reference [8]

Making UX Tests Stronger

- Checklist for Planning Usability Studies
  - Define goals and format for the testing
  - In lab, office, field; moderated or unmoderated; in-person or remote, etc.
  - Determine number of users; recruit appropriate users
  - Write tasks to match study goals: exploratory or specific
  - Conduct a pilot test
  - Decide on any metrics to collect
  - Write a test plan (Example template [9])
  - Motivate other team members to observe test sessions
- Reference [10]

Encouraging “Thinking Aloud” in UX Tests

When this happens	Say this
You’re not sure what the participant is thinking	What are you thinking? What are you looking at?
The participant seems surprised by something	Is that what you expected to happen?
The participant asks for a clue or direction	What would you do if I wasn’t here? Or Do whatever you’d normally do.
The participant makes a comment, but you’re not sure what triggered it	Was there something in particular that made you think that?

- In most usability tests the goal is to get the users to “Think Aloud”
- As facilitator, your goal is to be “non-directive”, neutral
- Krug describes this list as “things a therapist would say”
- Full list available at [14]

Summary

- It's likely that the UX verification and validation activities will start in the design phase, and maybe earlier
- It's good to remember that uncovering issues is generally more expensive as the product becomes more finished, which should drive some early test cycles
- You will always learn something from user-based testing efforts at any point
- We'll visit some specific testing methods for this phase next…

References

[1] https://www.lexico.com/en/definition/verification
[2] https://www.lexico.com/en/definition/validation
[3] http://www.easterbrook.ca/st eve/2010/11/the-difference-between-verification-and-validation/
[4] https://insights.sei.cmu.edu/sei_blog/2013/11/using-v-models-for-testing.html
[5] User Experience Ream of One, Buley, 2013, Rosenfeld
[6] https://hci.stanford.edu/courses/cs377e/2016/sp/lectures/12%20-%20usabilty%20testing.pdf
[7] Don't Make Me Think, Krug, 2006, New Riders
[8] https://www.nngroup.com/articles/how-many-test-users/
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