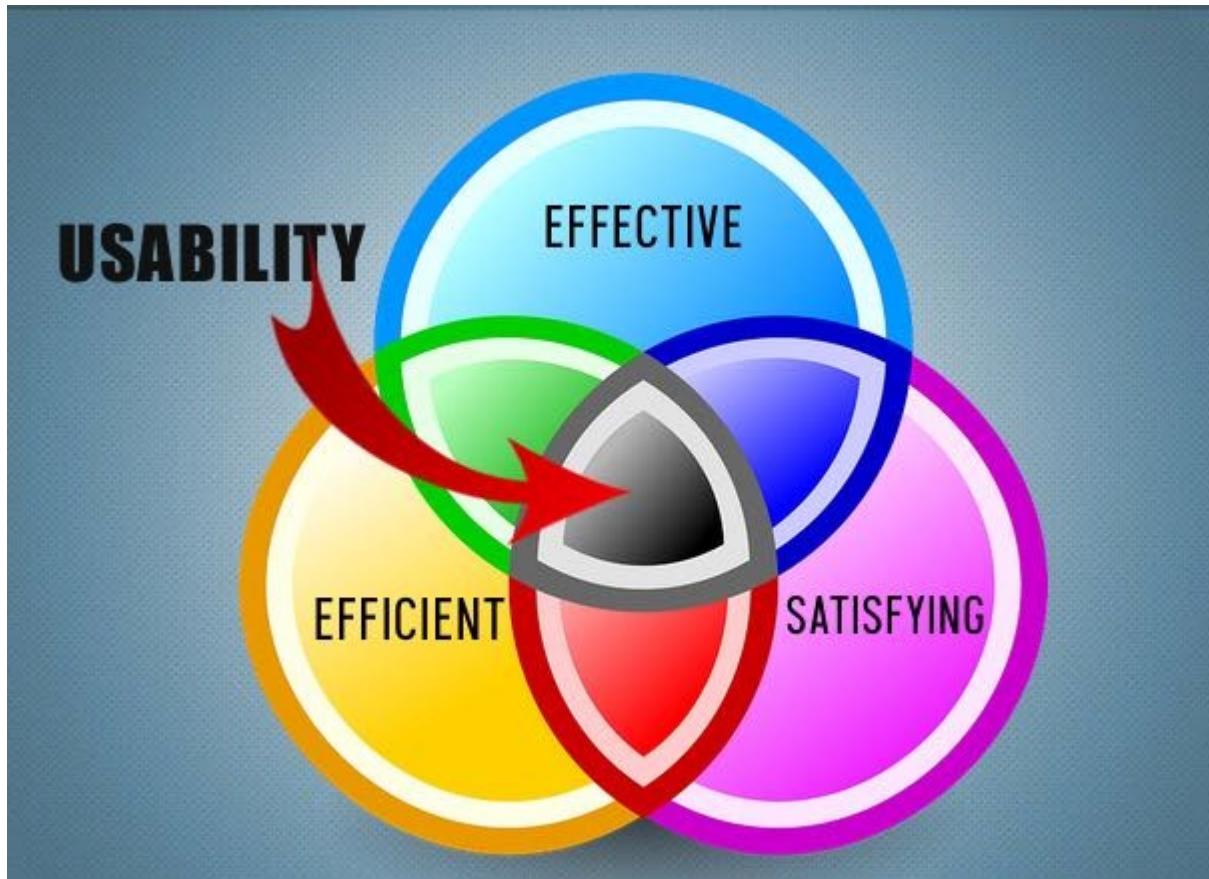


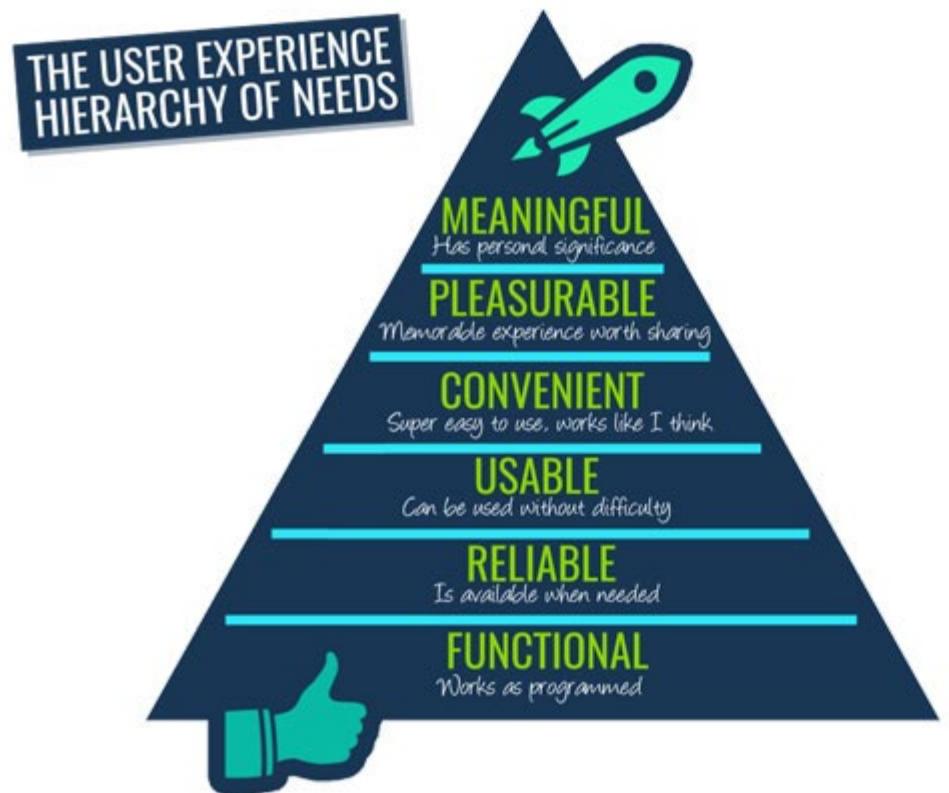
Introduction to Usability

- Understanding the ease of use and effectiveness of a system.



Importance of Usability

- Usability impacts user satisfaction, productivity, and error rates.



Heuristic Evaluation

- A method to identify usability problems using usability principles (Nielsen, 1994).

Usability Heuristics

- Common principles: visibility, consistency, error prevention, and more.



Visibility of System Status

1



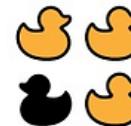
Match Between System & Real World

2



User Control And Freedom

3



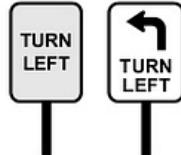
Consistency And Standards

4



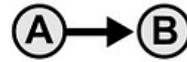
Error Prevention

5



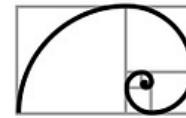
Recognition Rather Than Recall

6



Flexibility And Efficiency of Use

7



Aesthetic And Minimalistic Design

8



Help Users With Errors

9



Help And Documentation

10

Cognitive Walkthroughs

- Evaluating task flow based on user goals and system feedback.

Cognitive Walkthroughs

How to Conduct a Cognitive Walkthrough

- Identify a goal for the test.
- Test with both internal and external participants.
- Consider the participant's perspective.
- Create both specific and general tasks.
- Use some internal jargon.
- Review each question before the test.
- Debrief the participants after the test.



Steps in Cognitive Walkthrough

- Define tasks, identify goals, analyze actions (Wharton et al., 1994).

Task

Action step

	Action success	Action failure
--	----------------	----------------

Will the user try to achieve the right result?	yes <input type="checkbox"/>	from experience the system tells them to	no <input type="checkbox"/>	
Will the user notice that the correct action is available?	yes <input type="checkbox"/>	from experience they would see a call-to-action	no <input type="checkbox"/>	
Will the user associate the correct action with the effect they're trying to achieve?	yes <input type="checkbox"/>	from experience a prompt/label matches action	no <input type="checkbox"/>	

Think Aloud Studies

- Users verbalize thoughts while interacting with a system.

Problem type	Description	Typical protocol-items signalling the problem
Uncertainty about action planning	Subjects do not see where they possibly could go (click) next, or they see several possibilities but haven't got a clue about which one to select	I see books, I see a lot of things...but where should I go now? Can I click this at all? OK, let me see if something is clickable here.
Orientation	Subjects do not understand where they are or cannot interpret their current location in the context of other locations in the website	What does this mean? Where am I now? I guess I should be in a completely different part of the website?
Stuck in loops	Subjects think they move on to a different location in the website but appear to (repeatedly) return to where they came from	... hey, I've been here before! **, again this stupid page.
Unexpected result	Subjects expect a certain result after clicking a link, but this result does not occur	...and then I click this and hope something happens...but it doesn't.
Failed repetition of actions	Subjects think they remember how to navigate because they feel they did that before, but the (assumed) repetition fails	Oh ... yes...and now I should be able to select a title here.... Oh no, apparently I can't.
Reasoning about navigation logic	Subjects start reasoning about why the interface makes them think they can find certain information behind a link	A clock that is ticking... ah, perhaps that's a time machine. Let me try that....
Interface manipulation problem	Subject have problems handling certain objects in the interface (e.g. dragging a pointer over a calendar in order to get to	There's a calendar here, but when I click it nothing happens... how can I do this?



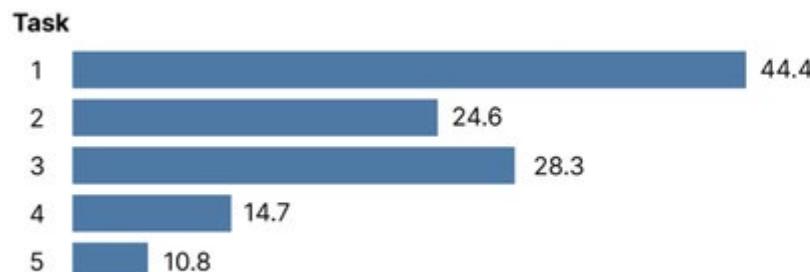
Benefits of Think Aloud

- Provides insights into user decision-making processes.

Usability Metrics

- Objective measures: task completion rate, error rate, and time on task.

Avg. completion time (sec.)



(a)

% of result type



● Success ● Error ● Abandonment

(b)

Task Completion Rate

- Percentage of users who successfully complete a task. Aim for >85%.

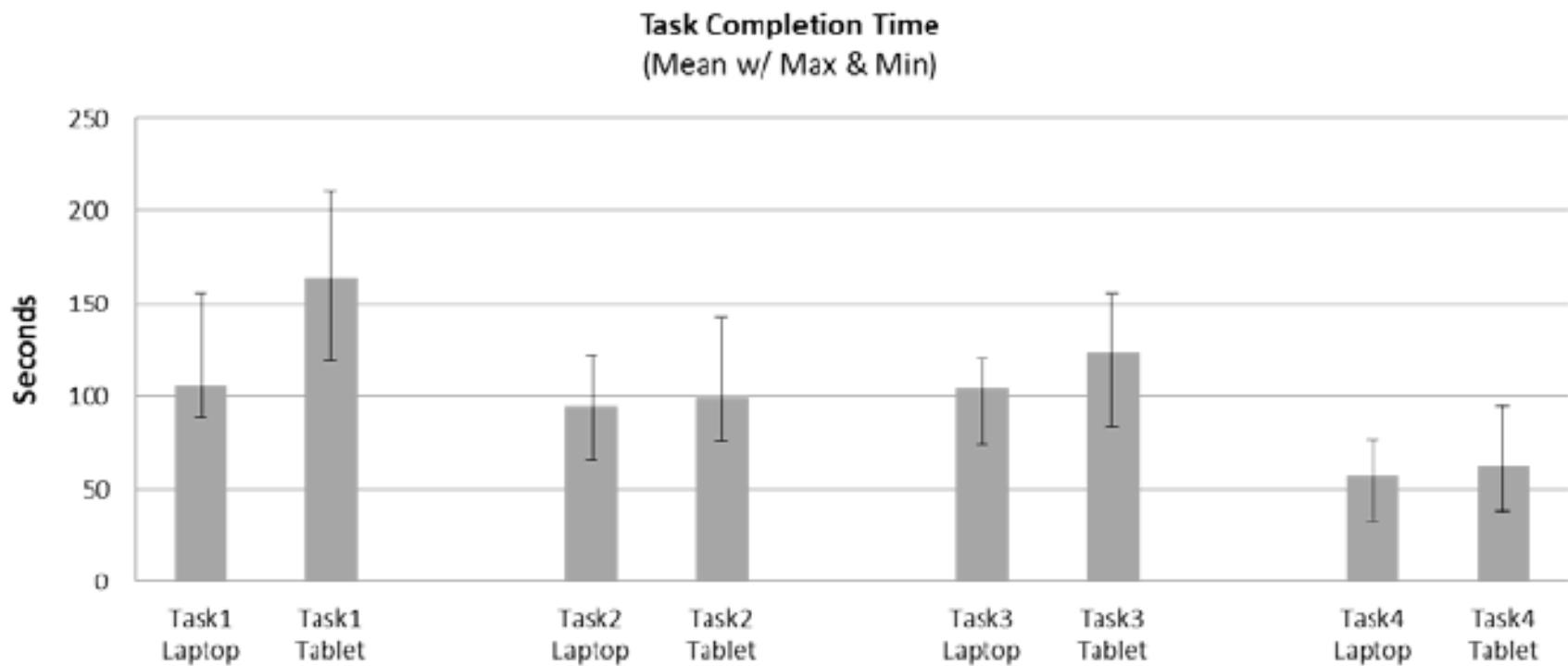
Error Rate

- Tracks errors made during interaction. Lower is better (e.g., 5%).

	Task 1	Task 2	Task 3	Task 4
Success Rate	17/20	13/20	14/20	18/20
Error rate	3/20	7/20	6/20	2/20
The avg. completion time	58 sec.	49 sec.	63 sec.	53 sec.
Satisfaction	7.25/10	6.75/10	7.5/10	8/10

Time on Task

- Measures efficiency by recording time needed to complete tasks.



System Usability Scale (SUS)

- A standardized survey to evaluate usability (Brooke, 1996).

System Usability Scale Scoring



HubSpot

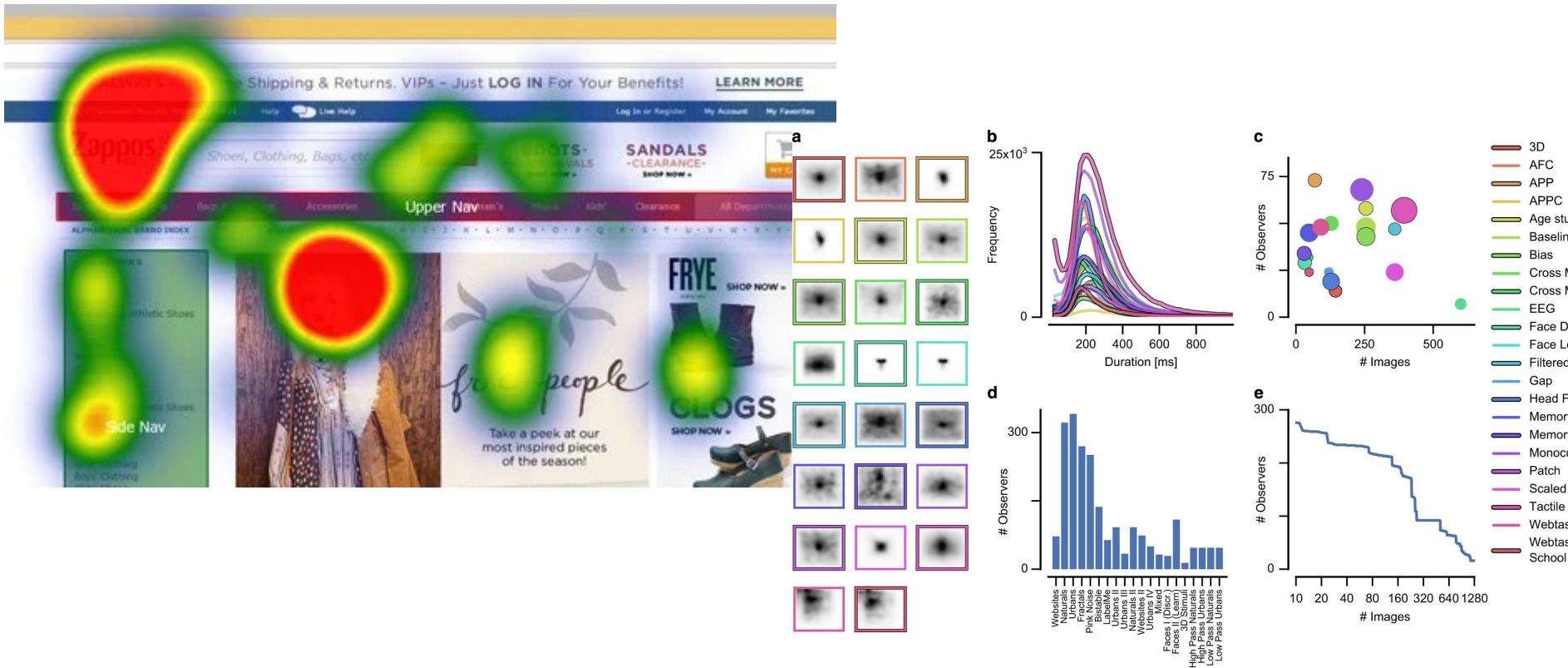
The System Usability Scale Standard Version		Strongly Disagree		
		1	2	3
1	I think that I would like to use this system frequently.		0	0
2	I found the system unnecessarily complex.		0	0
3	I thought the system was easy to use.		0	0
4	I think that I would need the support of a technical person to be able to use this system.		0	0
5	I found the various functions in this system were well integrated.		0	0
6	I thought there was too much inconsistency in this system.		0	0
7	I would imagine that most people would learn to use this system very quickly.		0	0
8	I found the system very awkward to use.		0	0
9	I felt very confident using the system.		0	0
10	I needed to learn a lot of things before I could get going with this system.		0	0

SUS Scoring

- Scores >68 indicate above-average usability.

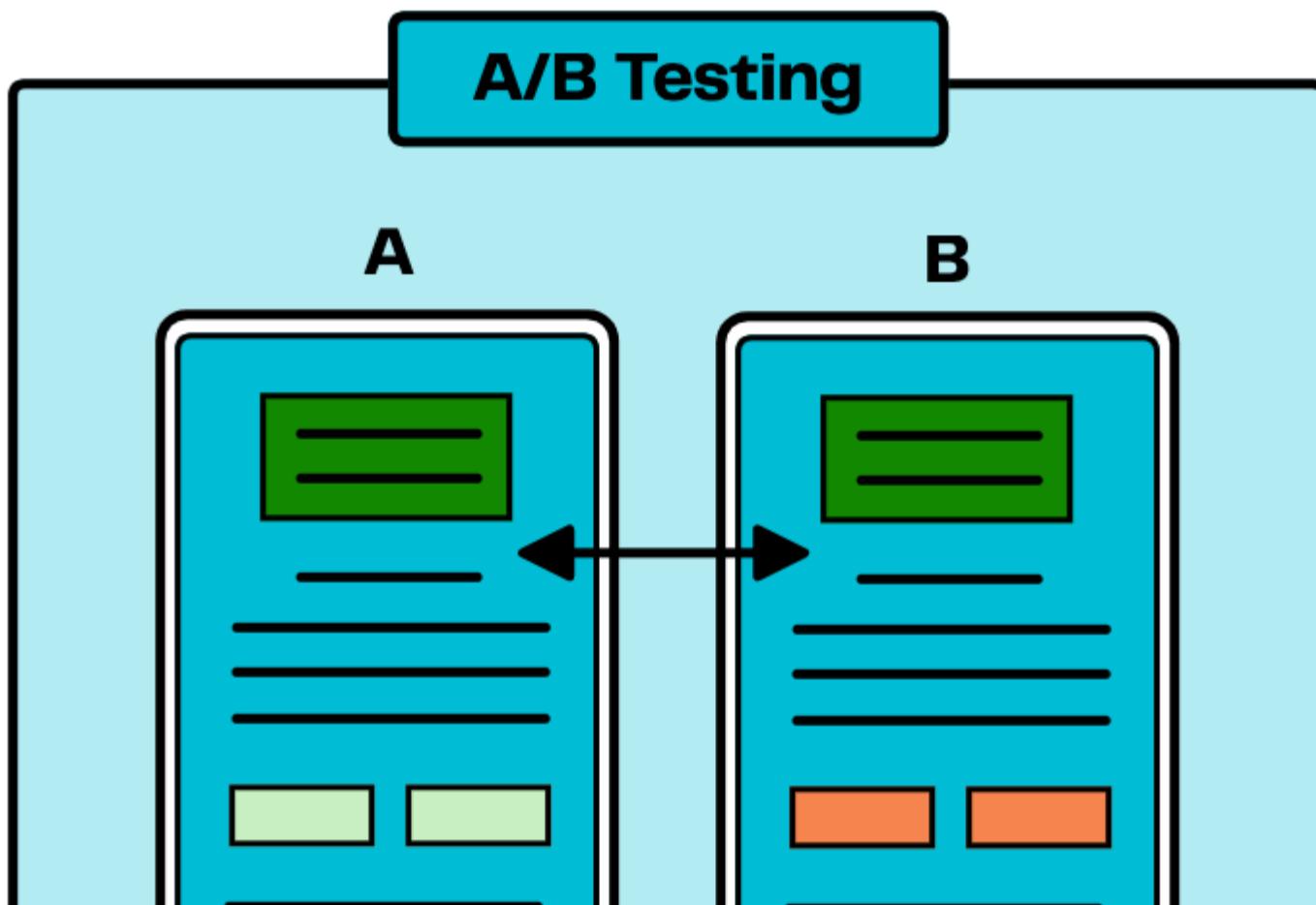
Eye-Tracking Studies

- Analyze user focus and navigation patterns (e.g., heatmaps).



A/B Testing

- Comparing two versions of a system to



Advantages of A/B Testing

- Provides quantitative data on user preferences.



Controlled Experiments

- Studies that test usability changes under controlled conditions.

EXPERIMENTAL CONTROL

DEFINITION	EXAMPLES
<p>Experimental control refers to the procedures and precautions taken to ensure that extraneous variables do not interfere with the results of an experiment. It ensures that the observed effects are solely due to the independent variable being tested. Proper controls help validate the experiment's outcome.</p>	<ul style="list-style-type: none">Randomization: Assign participants to groups randomly, so that individual differences are randomly distributed among groups.Standardization: Ensure that all participants experience the same conditions, instructions, and procedures.

HELPFULPROFESSOR.COM

Remote Usability Testing

- Allows users to test systems from their own environment.

The screenshot shows the Prolific platform interface. At the top, there are navigation links: 'STUDIES' (which is highlighted in blue), 'SUBMISSIONS', 'ABOUT YOU', 'HELP CENTRE', an envelope icon, '£0.00', and a user profile icon labeled 'NL'. Below this, the main content area is titled 'All studies' and shows '7 studies'. Three specific studies are listed:

- Give Your Opinion And Review A Website's Information Main**
By Mike Hudson
£0.46 • £6.62/hr | 4 mins | 11 places
- Purdue Beliefs and Behaviors Study (\$1.75 participation bonus from crime)**
By purdue...
£1.42 • £10.67/hr | 8 mins | 151 places
- Your Feedback on Cyber Crime**
By DPR... search

Three large green arrows point from the titles of the first three studies down to the detailed description of the top study on the right side of the screen.

Give Your Opinion And Review A Website's Information Main
By Mike Hudson

£0.46 • £6.62/hr | 4 mins | 12 places

Review a given website and give your opinion as requested.

We want to see how well a website appeals to an audience, and how trustworthy it appears.

You are not required to provide any personal information and the study will be anonymous. No downloads necessary. The data will only be used internally.

The survey involves multiple choice answers.

Qualitative Feedback

- Insights gained from user interviews and open-ended questions.

What is a **User Interview**?

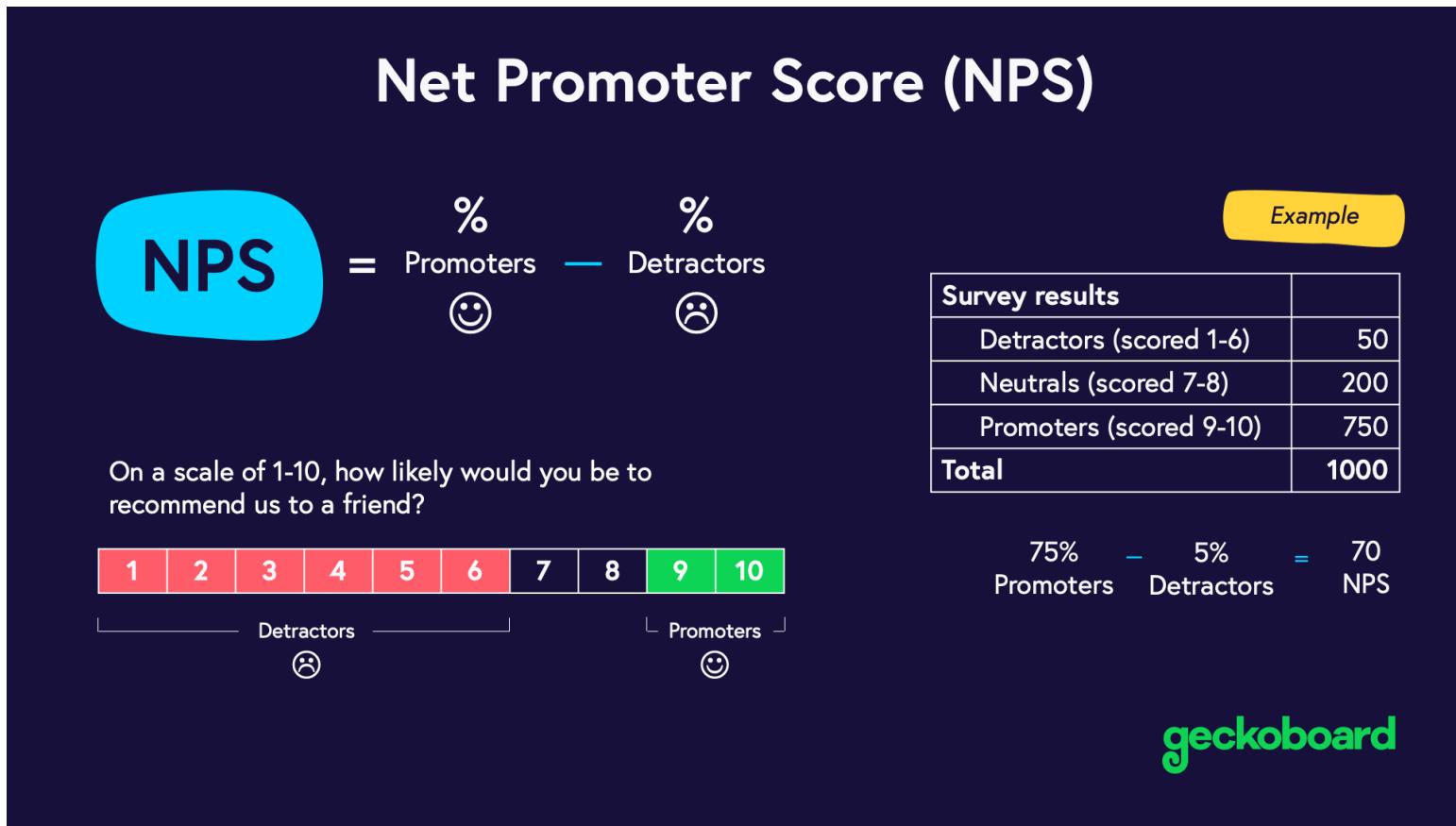


Quantitative Metrics

- Objective measures like error rates and task efficiency.

Net Promoter Score (NPS)

- Measures user loyalty based on likelihood to recommend.



User Satisfaction Surveys

- Gather subjective user feedback on system performance.

Based on your recent stay at our hotel, please rate your satisfaction with:

	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied
Overall stay experience	<input type="radio"/>				
Room cleanliness & hygiene	<input type="radio"/>				
Check-in experience	<input type="radio"/>				
Staff behavior	<input type="radio"/>				
Facilities and amenities	<input type="radio"/>				

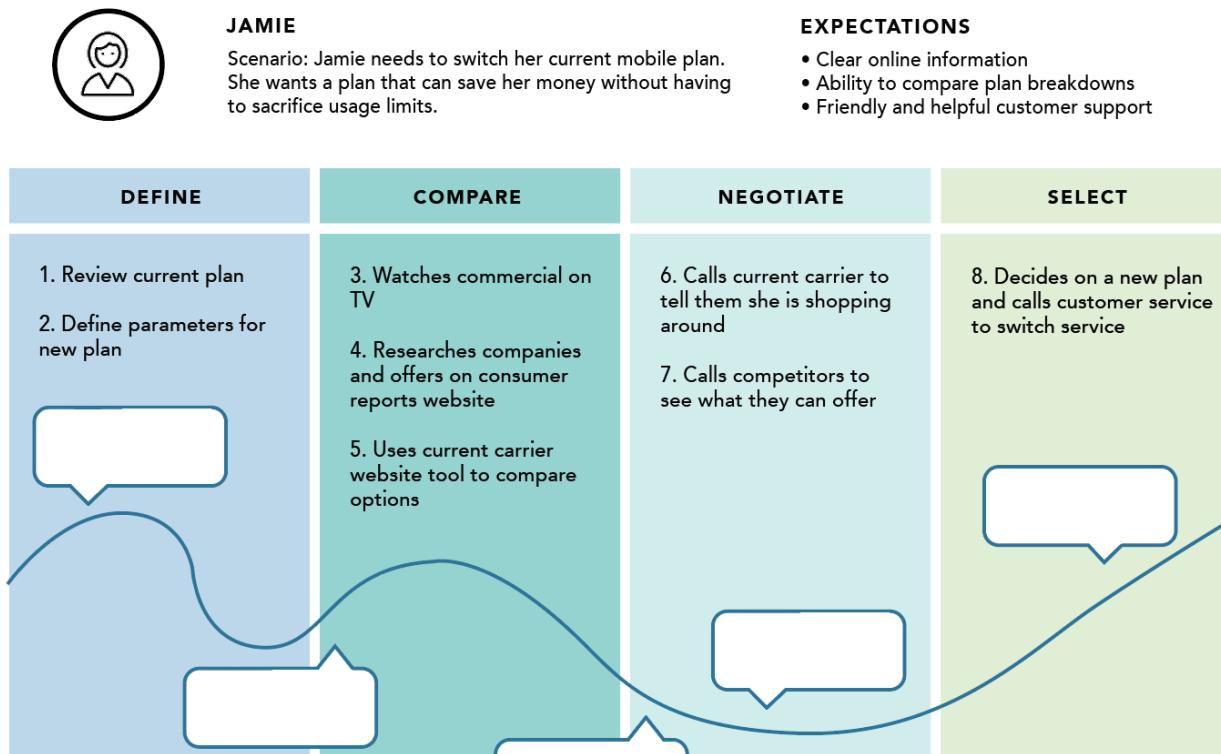
Task Analysis

- Breaks down tasks to understand user goals and difficulties.

User Journey Mapping

- Visual representation of user interactions over time.

CUSTOMER JOURNEY MAP Example (Switching Mobile Plans)



Accessibility Testing

- Ensures usability for users with disabilities (e.g., WCAG standards).

The Four Principles of WCAG



Perceivable

Information and UI components must be perceivable.



Operable

UI components and navigation must be operable.



Understandable

Information and the operation of UI must be understandable.



Robust

Content can be interpreted by a wide variety of user agents and assistive technology.

Mobile Usability

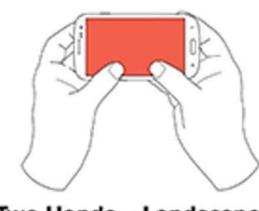
- Special considerations for usability on mobile devices.



Cradled



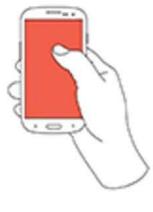
Hold and Touch



Two Hands – Landscape



One Hand – First Order



One Hand – Second Order



Two Hands – Portrait

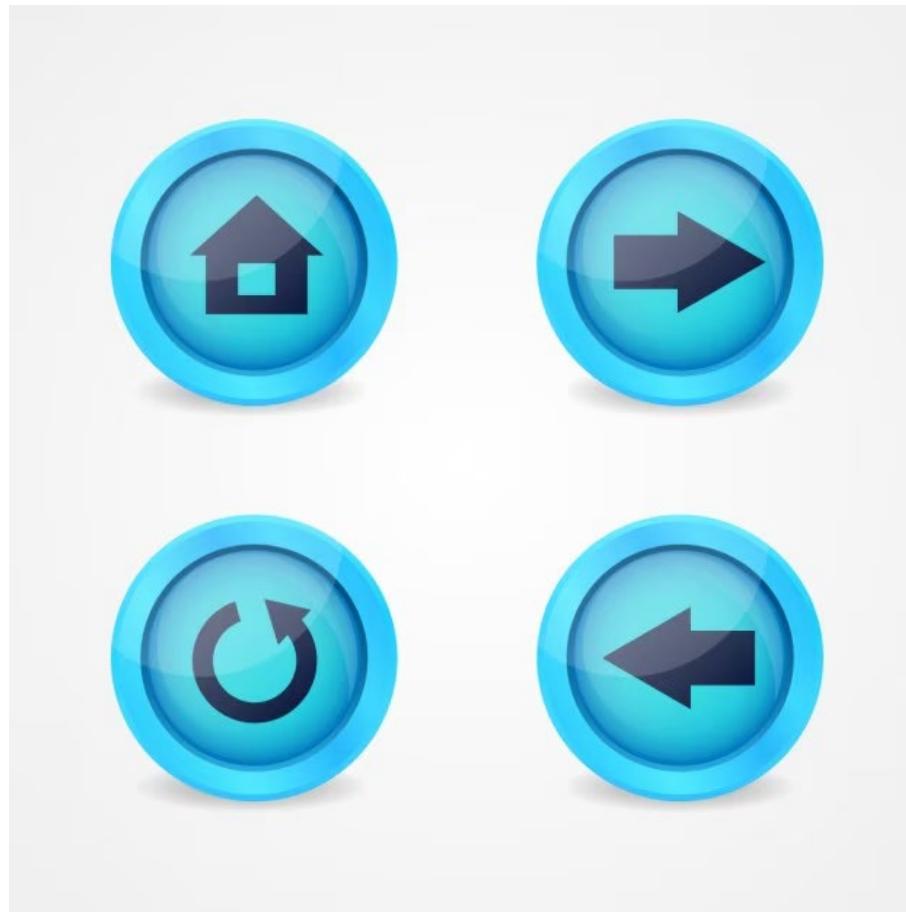


Responsive Design

- Adapts layout and functionality to different screen sizes.

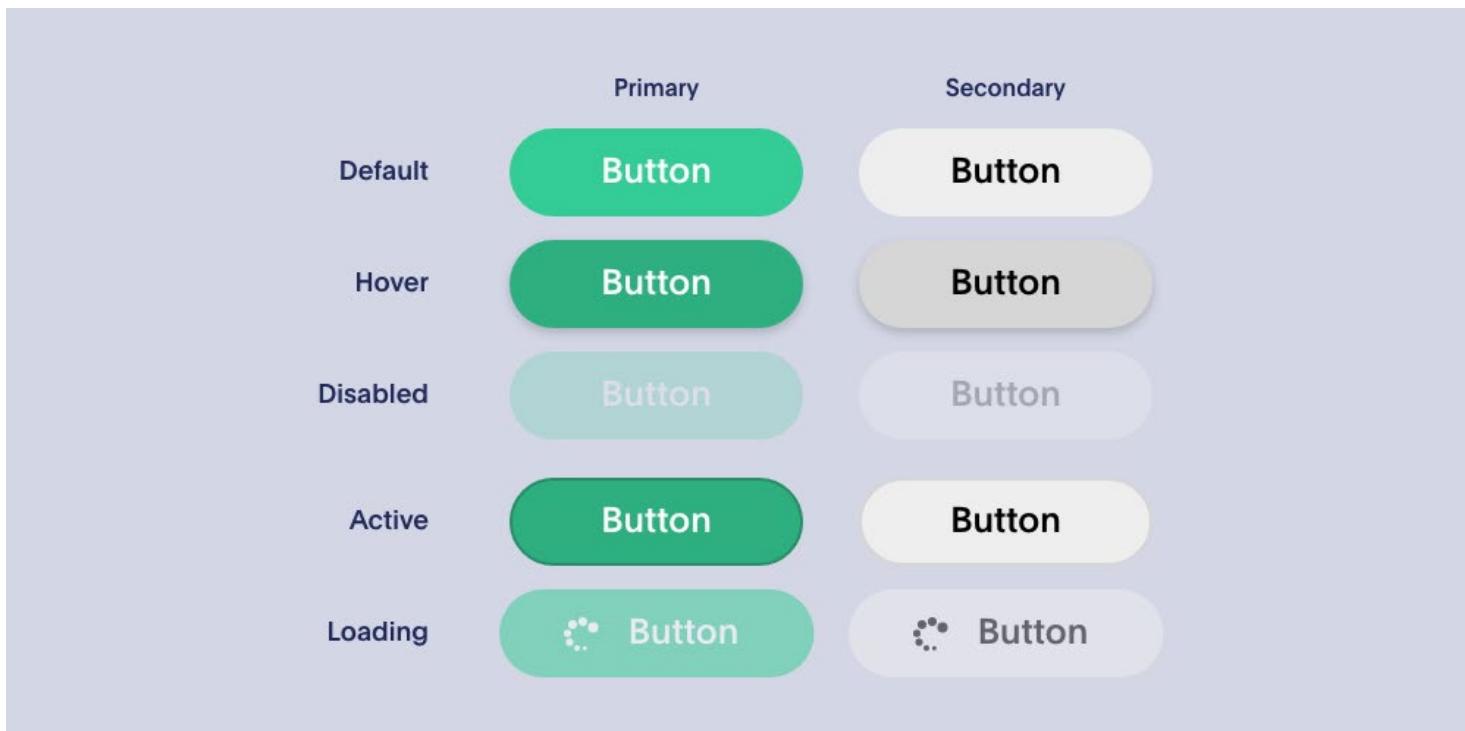
Error Recovery

- Designing for smooth recovery from errors.



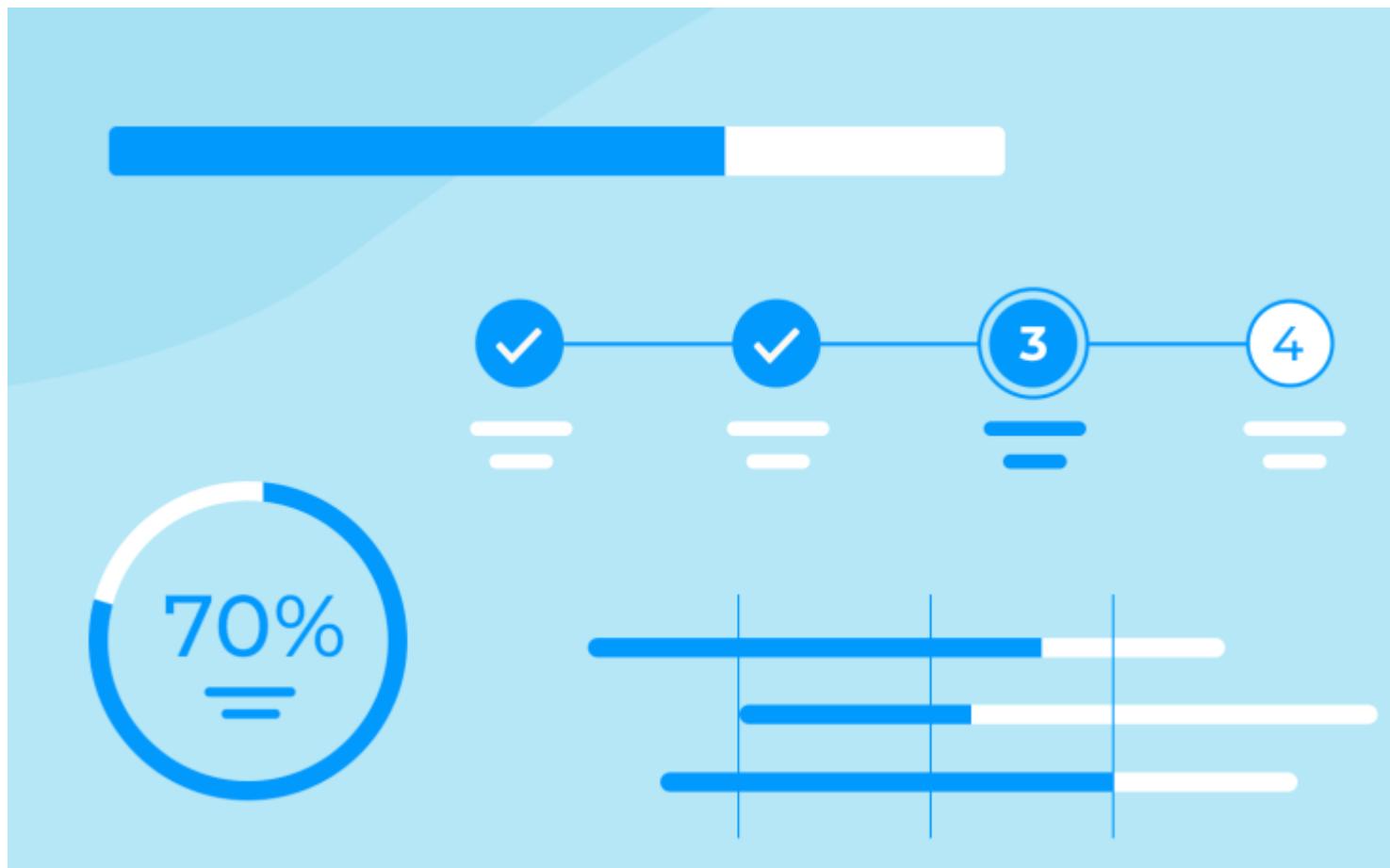
Feedback Loops

- Providing users with immediate and clear system feedback.



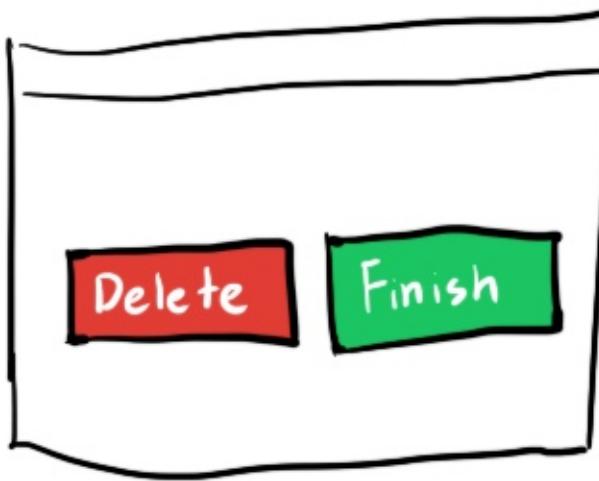
Progress Indicators

- Show users their progress in multi-step tasks.



Consistency in Design

- Ensures uniformity in navigation and interaction patterns.



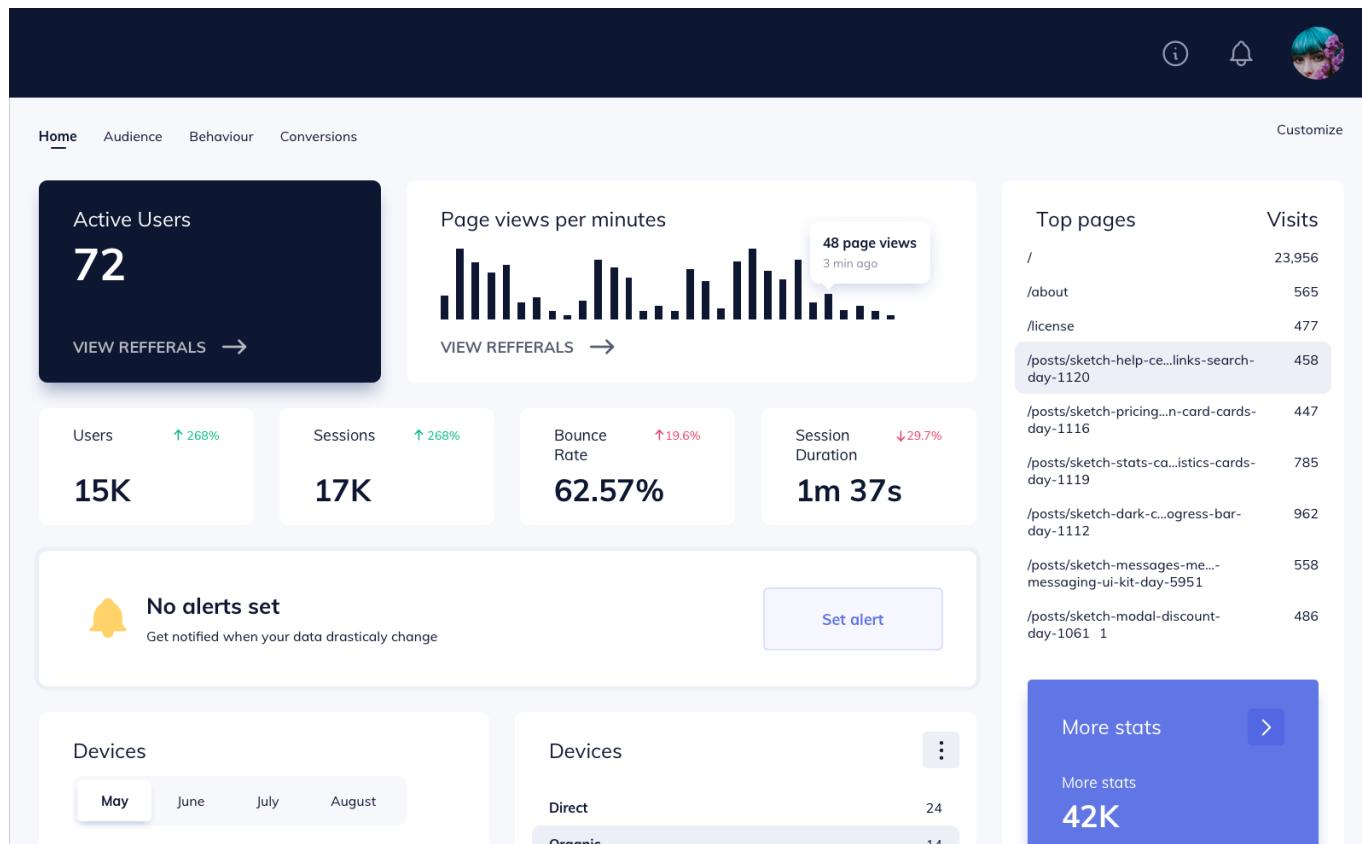
Minimizing Cognitive Load

- Reduces mental effort needed to use a system.



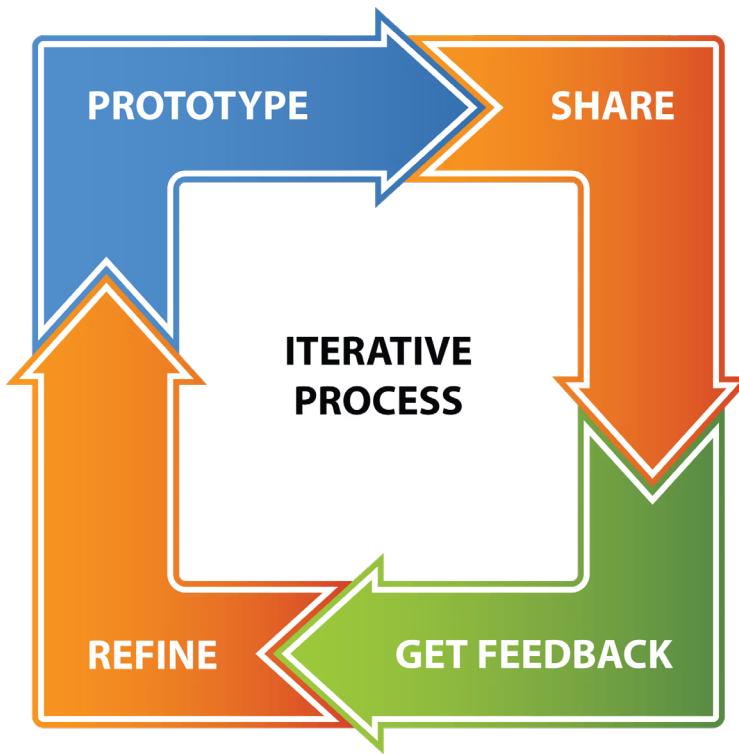
Engagement Metrics

- Measures how users interact and stay engaged with a system.



Iterative Design

- Improves usability through repeated cycles of testing and refinement.



Persona Development

- Creating user personas to guide design decisions.



Marie — The artist

Looking to sell her art easily online and gain exposure as an up and coming artist.

Age: 26

Marital status: Single

Occupation: Artist/Art Buyer

Location: London, UK

Income: £32,000

Bio

Julia is an artist in London. She graduated 4 years ago from art school and has been making art since joining a local studio 12 months ago.

Although she loves the people she works with, she has been giving serious thought to her future. While the studio that she works at is growing, she's worried that she won't developed a name for herself if she continues working with others. She's considering selling her art online and wants a reputable place to sell her pieces while gaining good exposure.

Needs

- To find the right website which offers the facilities she wants.
- To find a way to fund her artworks without incurring lots of debt.

Pain points

- Concerned that she'll need to manage mailing artworks and won't be able to afford the website fees
- Worried that she's one of many artists and won't get enough exposure
- Doesn't want the service to take too high a percentage of her sales

Ideal experience

- Mail her pieces internationally and ensure they arrive safely
- Manage her inventory easily from her iPhone
- Make great money to sustain her passion making art

Research
2 cards, 1 document

Quotes

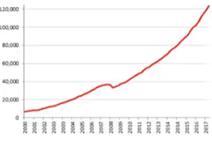
"It's important that I can connect with the buyers."

"I really just need an easy way to promote my art and keep prospective buyers up to date"

"The hardest part is managing the actual transaction."

Survey results
3 words

E-Commerce Sales



Year	Sales (approx.)
2008	10,000
2009	12,000
2010	15,000
2011	20,000
2012	25,000
2013	30,000
2014	35,000
2015	40,000
2016	50,000
2017	60,000

Scenario Testing

- Evaluating usability through real-world user scenarios.

Tasks	Description
Task 1	Demonstrate typical interaction with the documentation site as part of everyday work
Task 2	Find Exhibit Policies and Procedures on site and then interpret when this policy was last updated
Task 3	Locate specific instructions relating to 3 ½ inch floppy disks within the Digital Media Transfer Workflow and navigate the multi-page documentation using filter/search options on homepage, sitewide search, and the table of contents
Task 4	Locate specific instructions within the Reading Room Manual (repeating navigation functions from Task 3)
Task 5	Choose documentation to share with wider archival community and facilitate external access.
Task 6	Use search function to locate specific access statements for realia/memorabilia within the Guide to Processing Collections

Information Architecture

- Structuring content and navigation for optimal usability.

The screenshot shows a mobile application interface for a grocery store. At the top is a navigation bar with the following items: Groceries (with a dropdown arrow), Favourites, Nectar, Offers (highlighted in red), Discover, Recipes, Delivery Pass, Occasions, and Christmas. Below the navigation bar is a list of categories under 'Groceries Home'. The categories are: Christmas, Fruit & vegetables, Meat & fish, Dairy, eggs & chilled (highlighted in orange), Bakery, and Dietary & world foods. To the right of the 'Dairy, eggs & chilled' category, there is a secondary level of navigation with items: New, Cooked meats, olives & dips, Dairy & chilled essentials, Meal kits, Dairy & eggs, and Desserts. Arrows indicate that each category can be expanded to show more sub-items.

Category	Sub-Categories
Christmas	
Fruit & vegetables	
Meat & fish	
Dairy, eggs & chilled	New Cooked meats, olives & dips Dairy & chilled essentials Meal kits Dairy & eggs Desserts
Bakery	
Dietary & world foods	

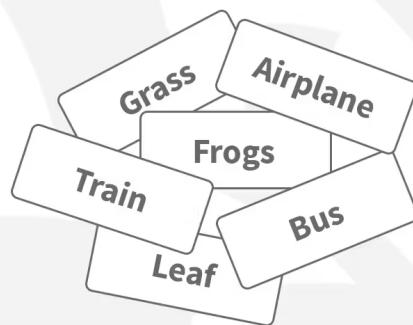
Card Sorting

- Understanding how users categorize and label information.

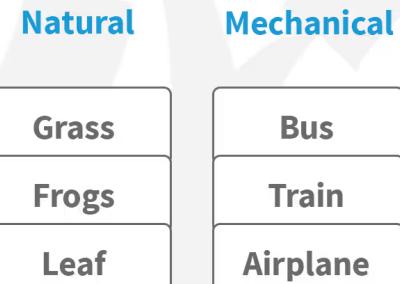
Closed Card Sort



1



2

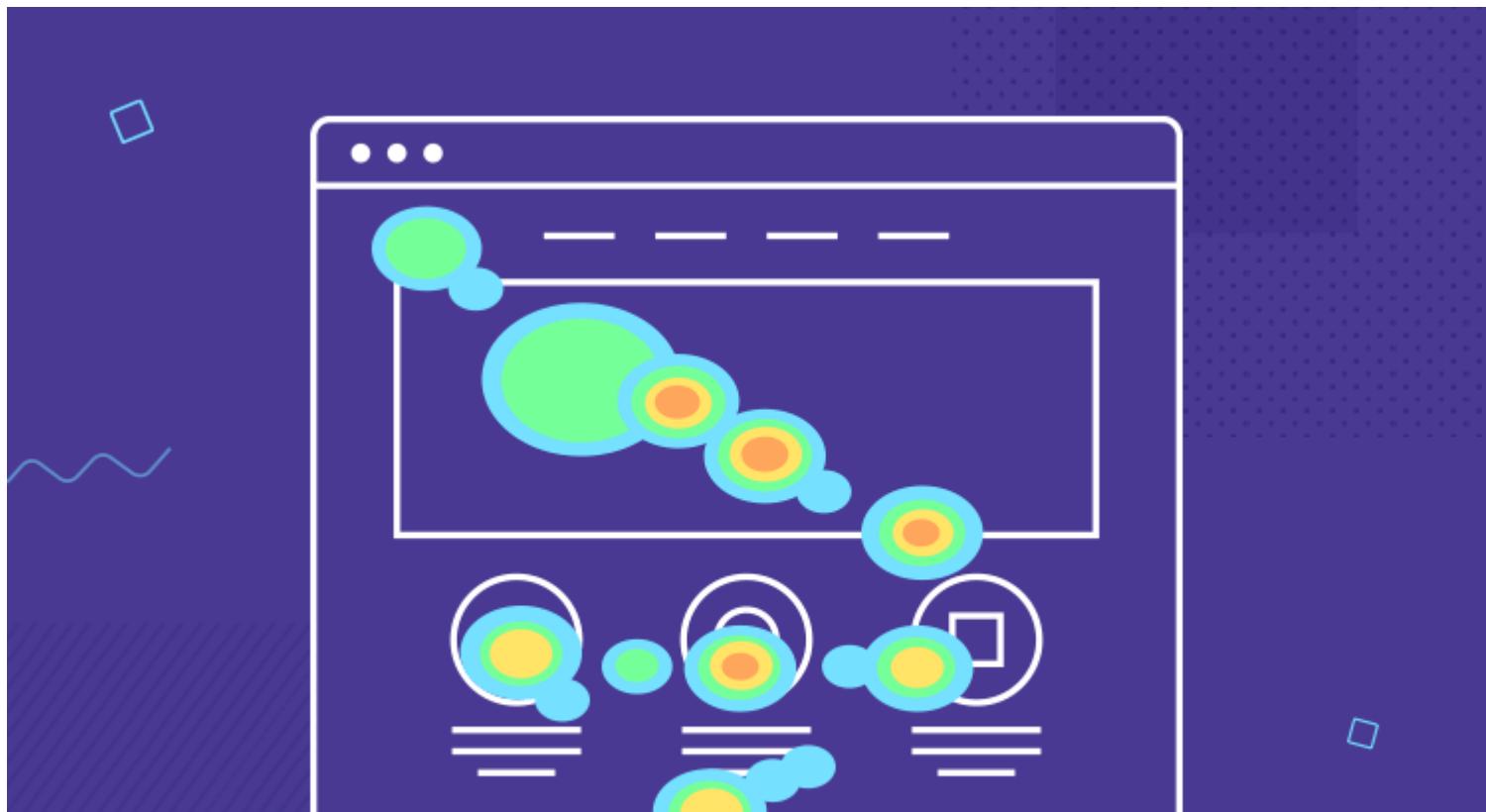


Participant gets a stack
of cards

Participant sorts cards into groups
the researchers have created

Heatmaps

- Visual representations of user interaction patterns.



Error Messages

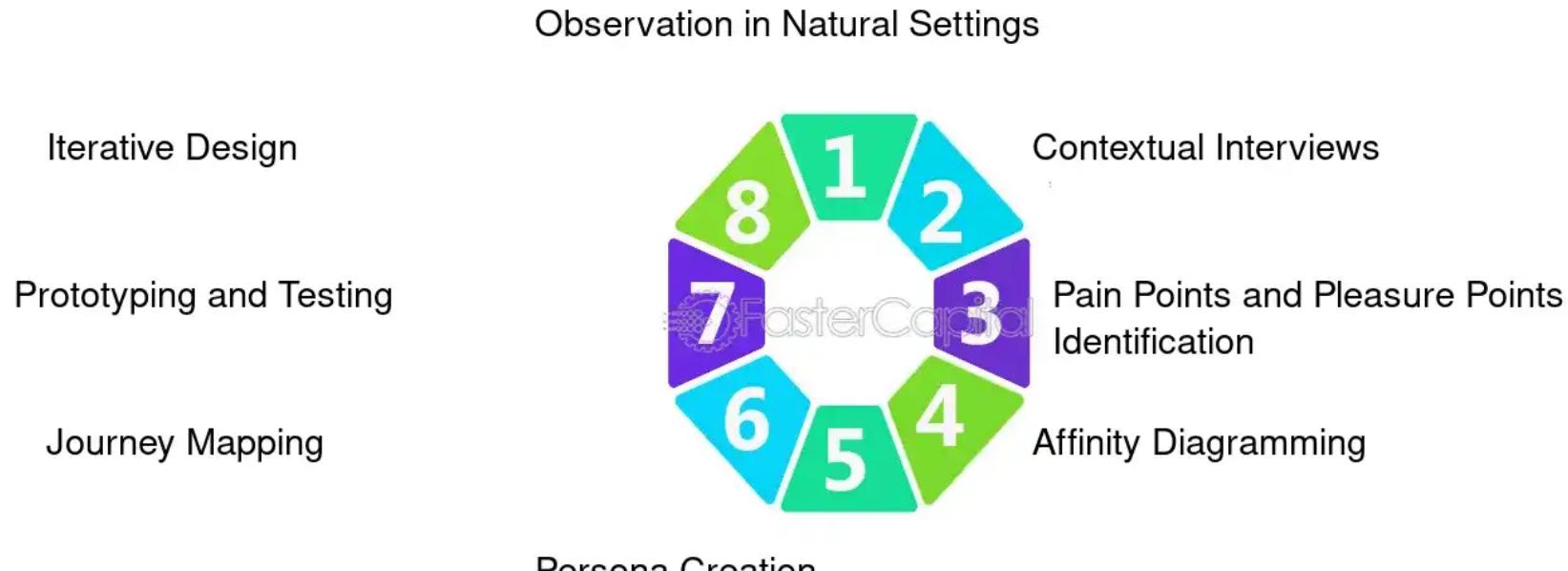
- Designing clear and actionable error messages.



Contextual Inquiry

- Observing users in their natural environment to gather insights.

Integrating Contextual Inquiry into Your Design Thinking Process



Competitive Usability Analysis

- Benchmarking usability against competitors.

2 Types of Competitive Usability Evaluations

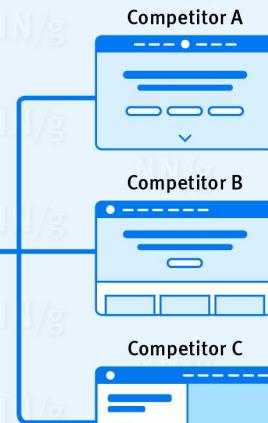
Competitive Reviews

An expert review of competitors' websites



Competitive Testing

A usability test of competitors' websites



Load Time Metrics

- Assessing how quickly pages and features load.

The image shows a screenshot of the Goldsmiths University of London website. The main content area features a large blue banner with the text "Different is what we do". Below the banner, there's a photograph of four students sitting on a concrete ledge outdoors. A call-to-action button "Book your place" is visible. At the bottom, there are links for "Search our courses", "Open Days and visits", "Accommodation options", and "Chat with our students". Above the main content, the browser's navigation bar includes "Study", "Course finder", "International", "More", a search bar, and a "Students, Staff and Alumni" dropdown. The browser's developer tools are open, specifically the Network tab, which displays a timeline of requests and a detailed list of network activity. The timeline shows various requests like "helpful.0e15f76d844d4cf02c5cbc78723e5eb...", "manifest.json", and "attribution_trigger?pid=655226&time=17325...". The list table includes columns for Name, Status, Type, Initiator, Size, and Time.

Name	Status	Type	Initiator	Size	Time
helpful.0e15f76d844d4cf02c5cbc78723e5eb...	200	script	(index):780	(memory ca...	0 ms
manifest.json	304	manifest	(index):813	264 B	566 ms
attribution_trigger?pid=655226&time=17325...	(blocked:ot...	xhr	ajaxRequestInterceptor.js	0 B	7 ms
sa.jpeg	(blocked:ot...	fetch	ajaxRequestInterceptor.js	0 B	7 ms
playlist/?id=11149680	200	xhr	ajaxRequestInterceptor.js	28.3 kB	786 ms
collect?v=2&tid=G-375J4LLPD0>m=45je4bk...	204	fetch	ajaxRequestInterceptor.js	543 B	762 ms
attribution_trigger?pid=655226&time=17325...	200	xhr	ajaxRequestInterceptor.js	(disk cache)	3 ms
collect?v=2&tid=G-375J4LLPD0&cid=1031056...	204	ping	js?id=G-375J4LLPD0&l=da	0 B	1 ms
attribution_trigger?pid=655226&time=17325...	(blocked:ot...	xhr	insight.min.js:1	48 B	2 ms
saq_px?uid=a3OKr1J_JeNAK3AK_NYExw&is_j...	(blocked:ot...	xhr	ajaxRequestInterceptor.js	0 B	2 ms
collect?v=1&_v=j101&a=484324415&t=pagevi...	200	xhr	ajaxRequestInterceptor.js	26 B	581 ms
collect?v=2&tid=G-375J4LLPD0>m=45je4bk...	204	fetch	ajaxRequestInterceptor.js	20 B	589 ms
set_partitioned_cookie?uid=772915089.173...	200	ping	collect	0 B	565 ms
clarity.js	200	script	Sh547vv898:1	(memory ca...	0 ms
main.MWQ3ODVjY2ZhMA.js	200	script	sdk.js?sdkid=B5G11MIHO:1	(memory ca...	0 ms
identify_45dd5971.js	200	script	main.MWQ3ODVjY2ZhMA	(memory ca...	0 ms
pixel	200	ping	main.MWQ3ODVjY2ZhMA	873 B	583 ms

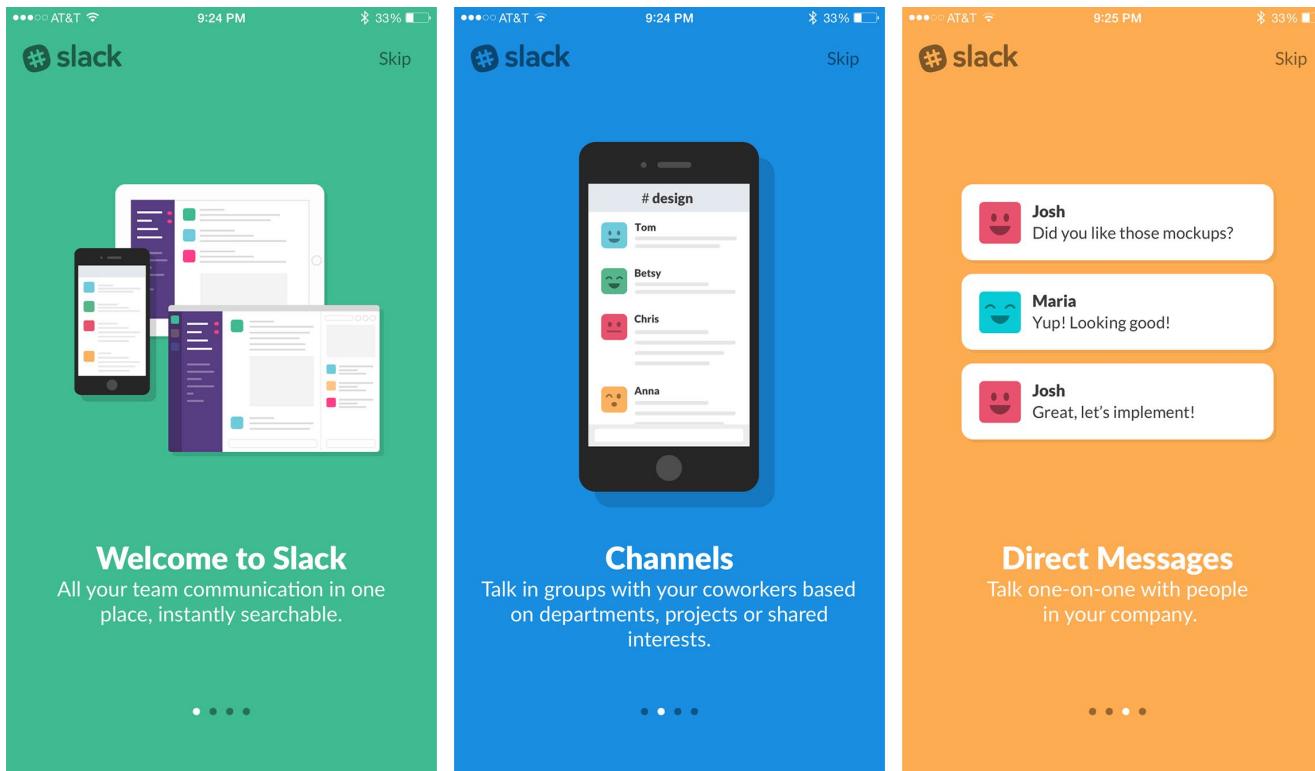
Microinteractions

- Small design details that enhance user experience.



User Onboarding

- Strategies to help users quickly adapt to a system.



Gamification

- Using game-like elements to increase engagement.



Make your own *games* by learning
JavaScript programming!

jsdares is an open source proof-of-concept. [Learn more...](#)

```
// Adapted from billmill.org/static/canvastutorial
// This code is still relatively complicated ... you
// can come up with a nice game for on the front page
// which is fun, simple, and shows off the capabilities
// of the interface, then contact me :)
```

```
var context = canvas.getContext("2d");

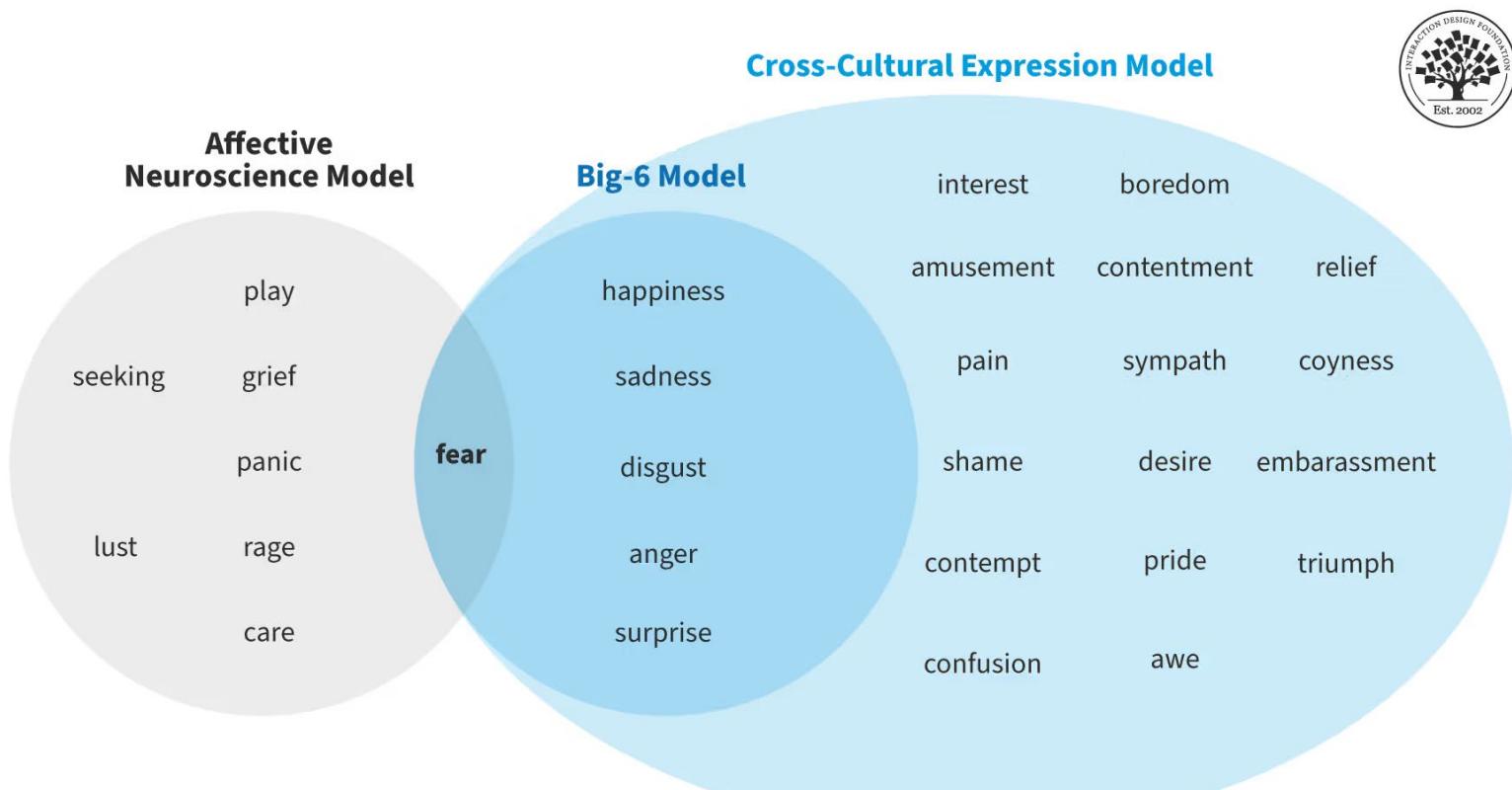
var bricks = [];
var paddleWidth, paddleHeight, bricksNumX, bricksNumY;
var brickWidth, brickHeight, brickMargin, paddleX;
var ballX, ballY, ballVx, ballVy, ballDirX, ballDirY;
var restart = true;

for (var y=0; y<20; y++) {
    bricks[y] = [];
    for (var x=0; x<20; x++) {
        bricks[y][x] = true;
    }
}

function setValues() {
    paddleWidth = 80;
    paddleHeight = 10;
    bricksNumY = 7;
    bricksNumX = 5;
    brickWidth = canvas.width / bricksNumX;
    brickHeight = 20;
    brickMargin = 4;
    ballVx = -7;
    ballVy = 12;
}
```

Emotional Design

- Creating designs that evoke positive emotions.

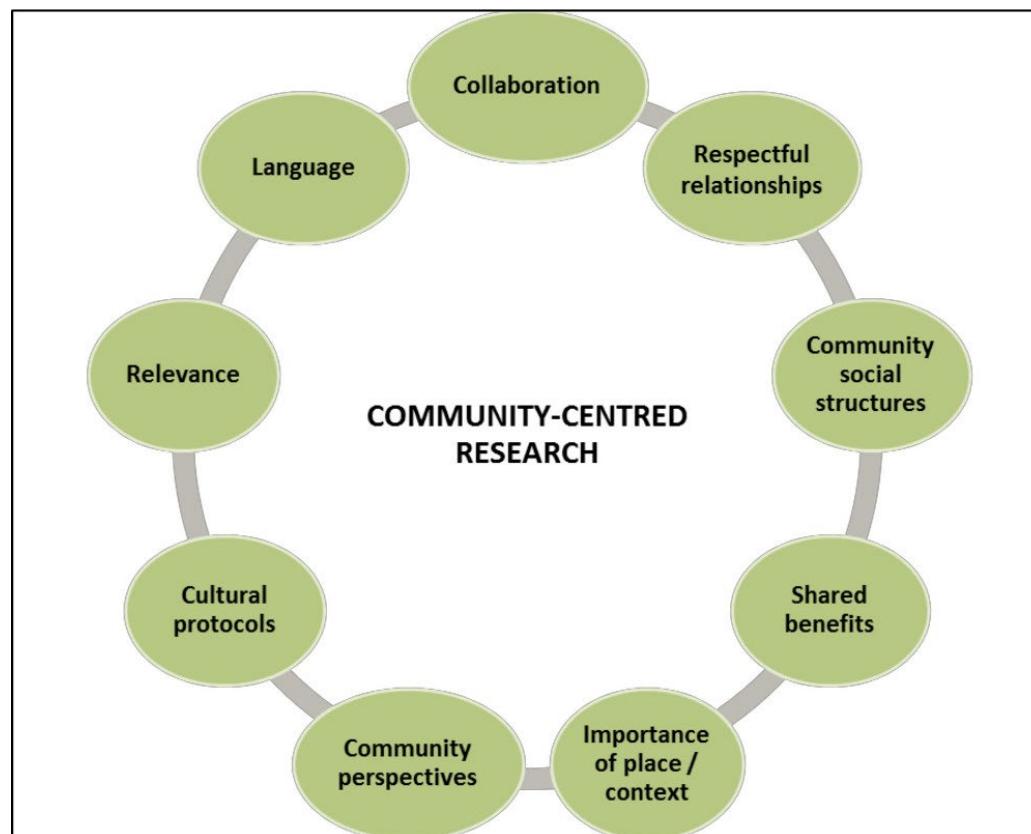


Future Trends in Usability

- Exploring innovations like AI and VR in usability testing.

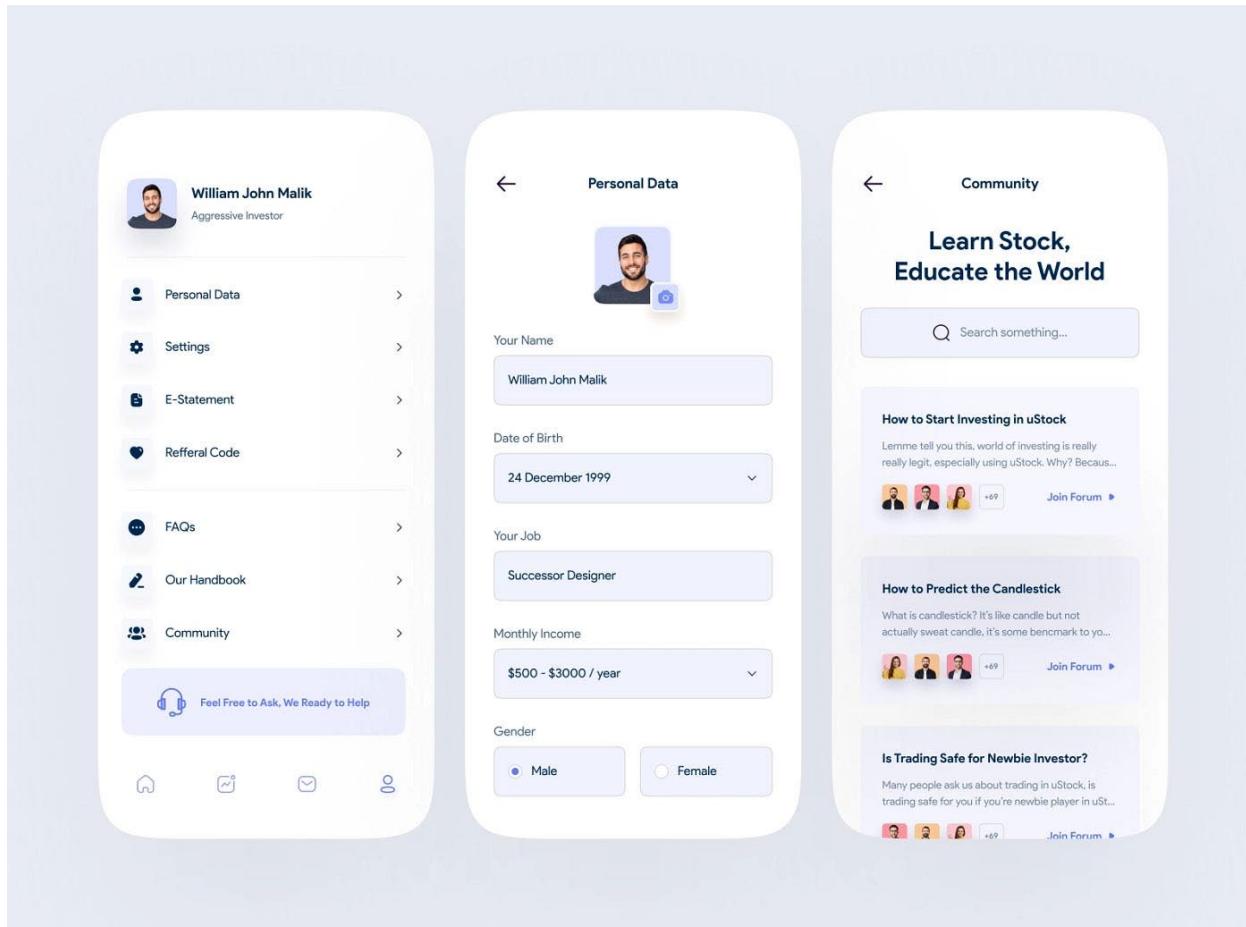
Cross-Cultural Usability

- Designing for a global and diverse audience.



Simplicity in Design

- Emphasizing clarity and ease of use.



User Advocacy

- Ensuring that user needs remain the focus of design decisions.



Summary and Conclusion

- Purpose of testing with users?
- When should we test with users?
- How would you plan an in person study?
- Considerations around remote usability testing?