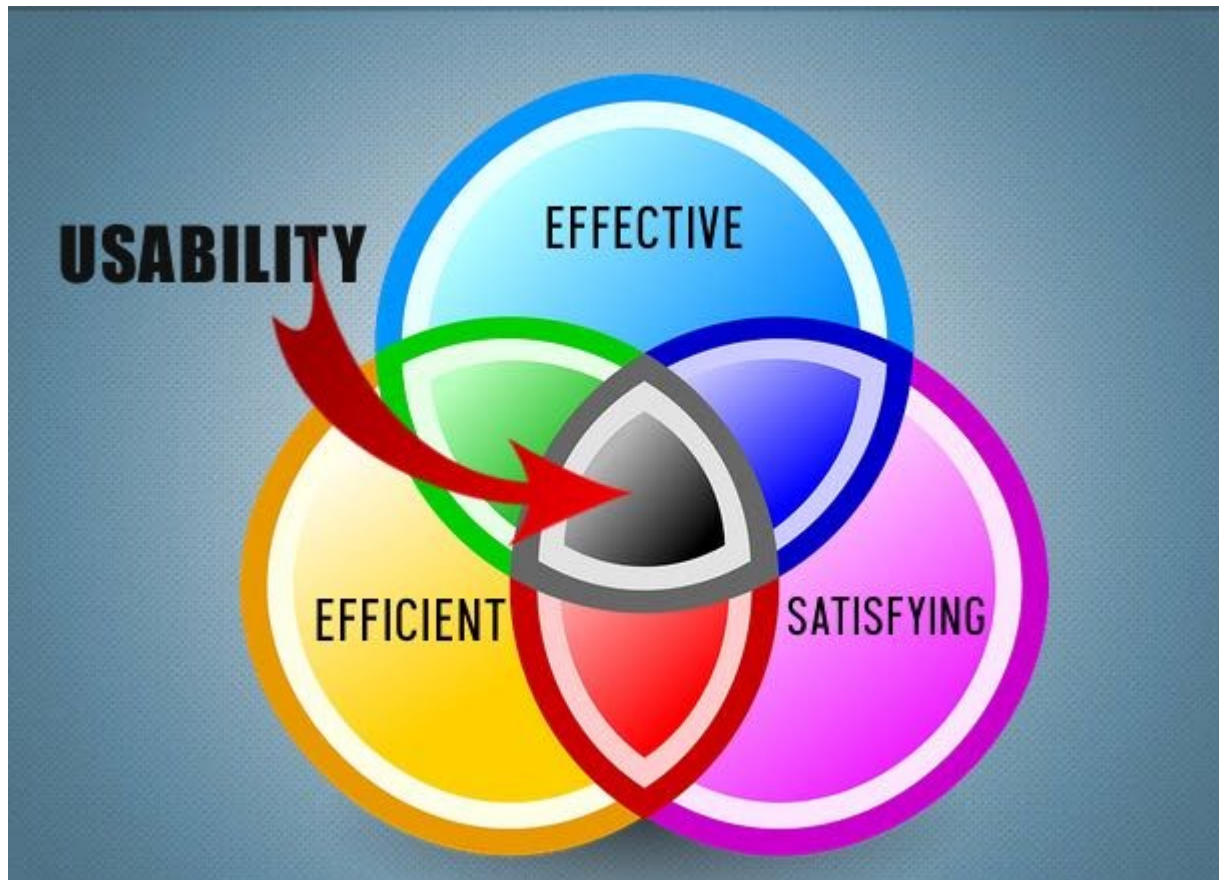


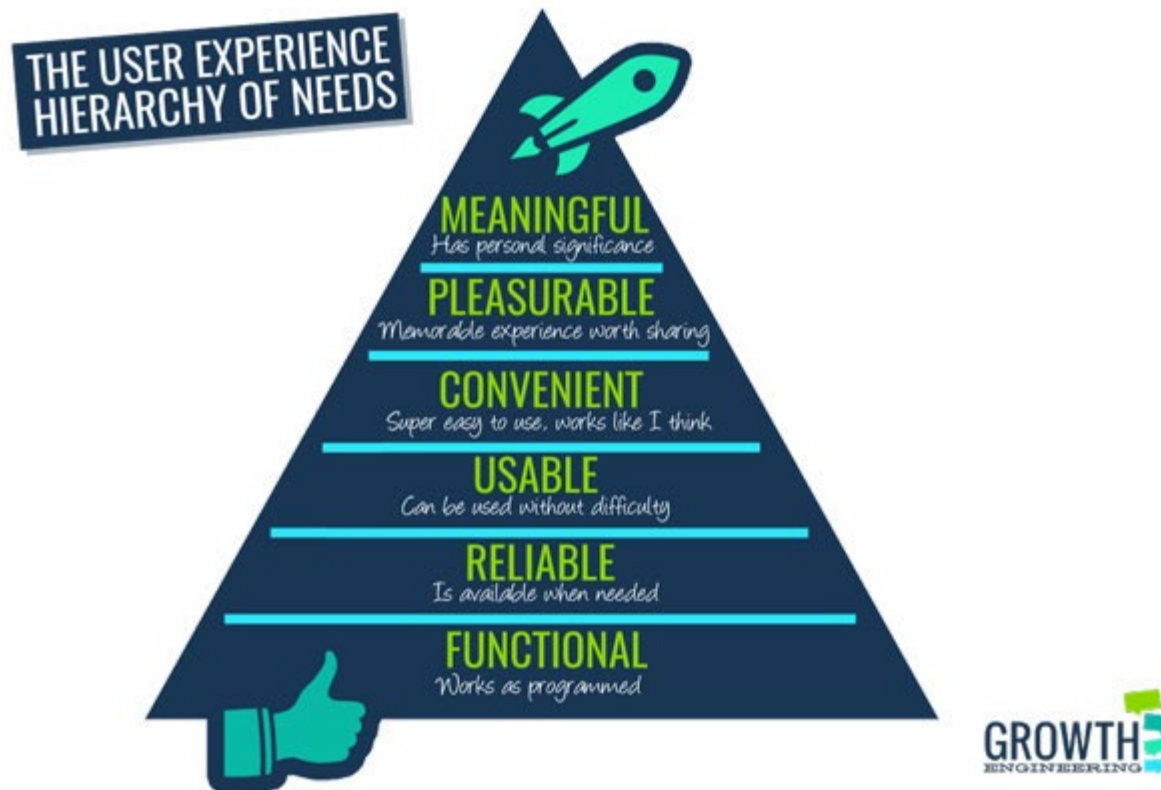
Introduction to Usability

- 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



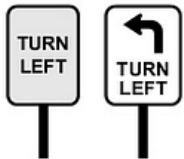
Consistency
And Standards

4



Error
Prevention

5



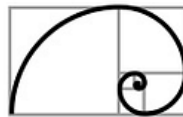
Recognition
Rather Than Recall

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 success	Action failure
Action step				
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 of 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?



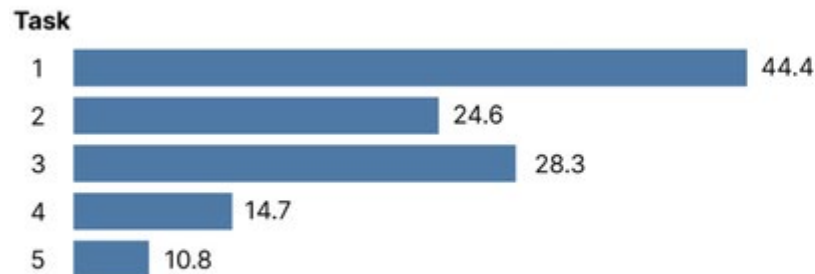
Benefits of Think Aloud

- Provides insights into user decision-making processes.

Usability Metrics

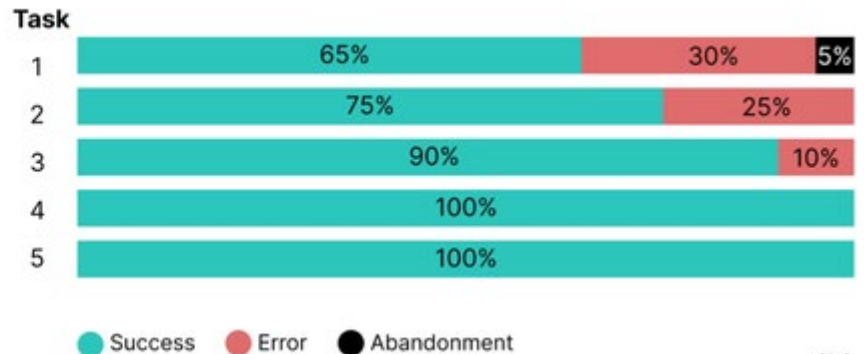
- Objective measures: task completion rate, error rate, and time on task.

Avg. completion time (sec.)



(a)

% of result type



(b)

Task Completion Rate

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

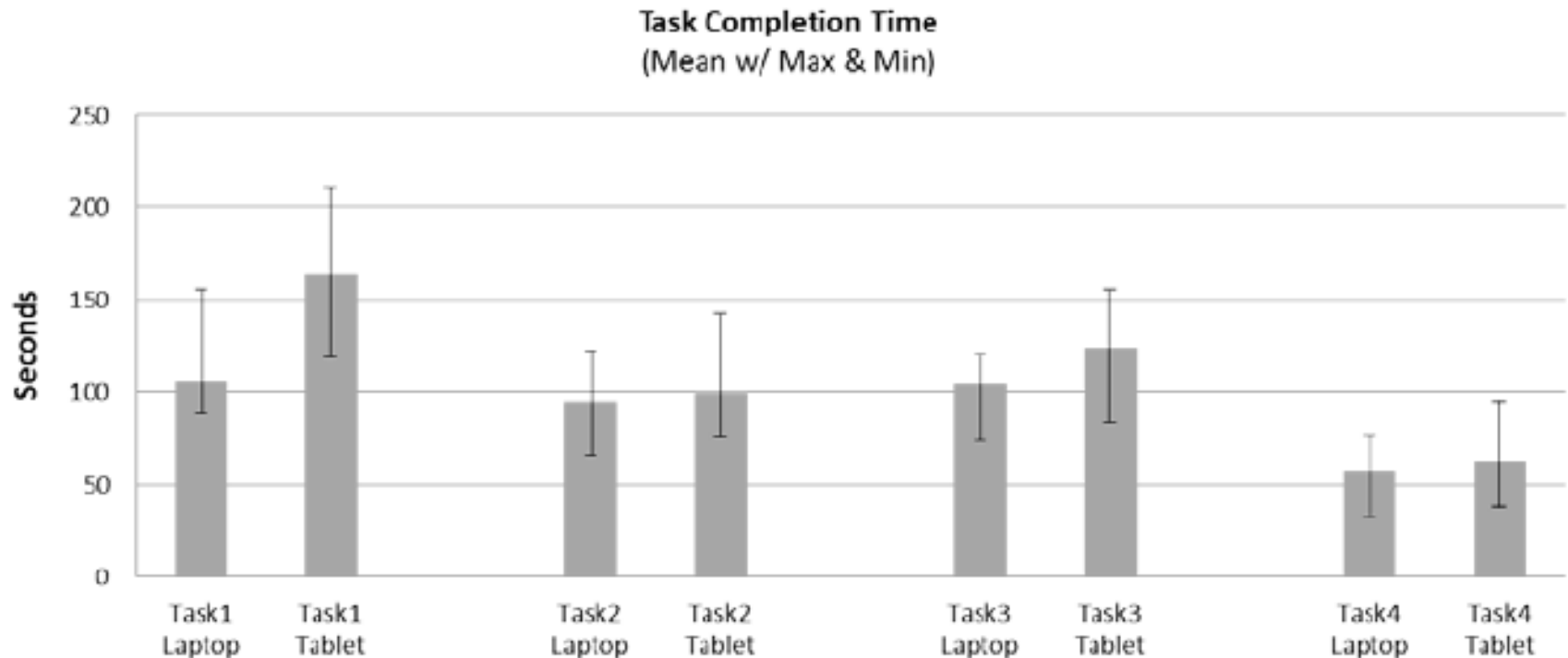
Error Rate

- 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

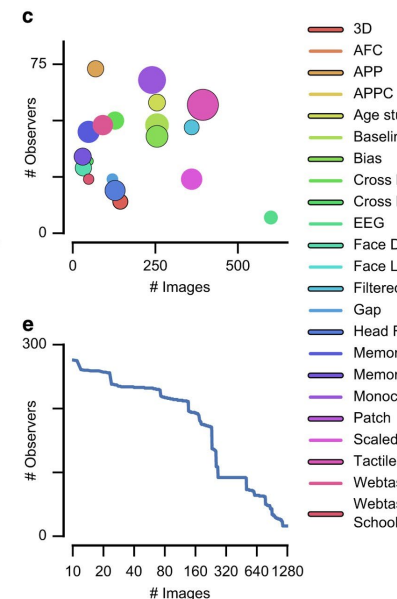
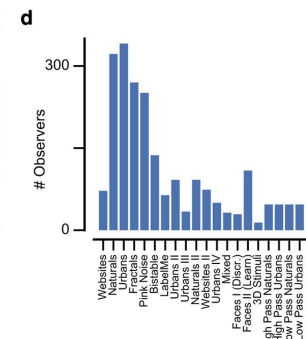
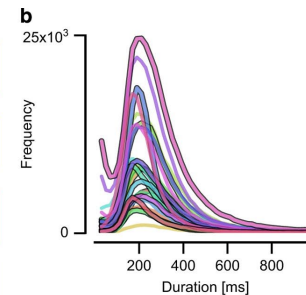
The System Usability Scale Standard Version		Strongly Disagree		
		1	2	3
1	I think that I would like to use this system frequently.		0	0
2	I found the system unnecessarily complex.		0	0
3	I thought the system was easy to use.		0	0
4	I think that I would need the support of a technical person to be able 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.

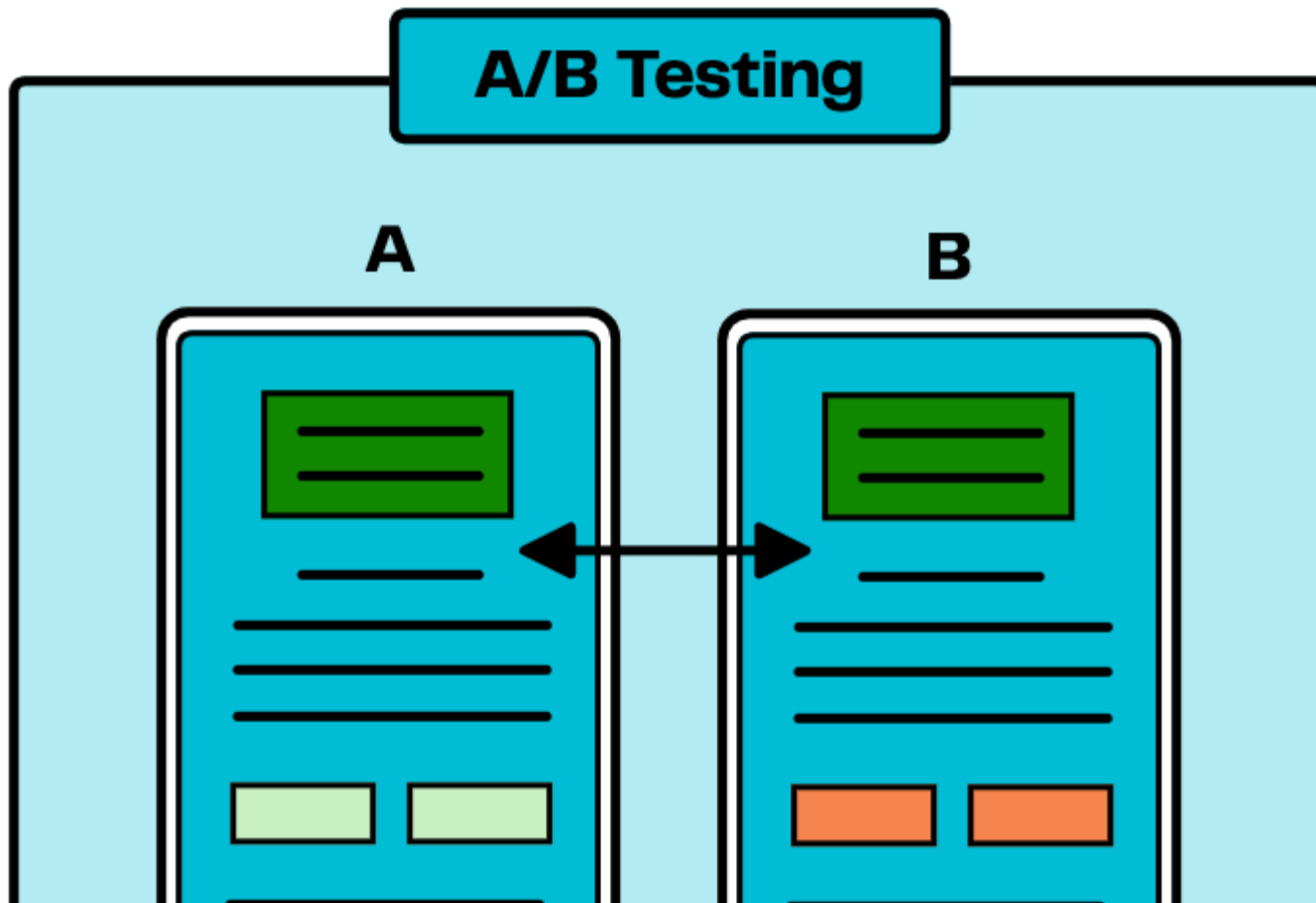
Eye-Tracking Studies

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



A/B Testing

- Comparing two versions of a system to



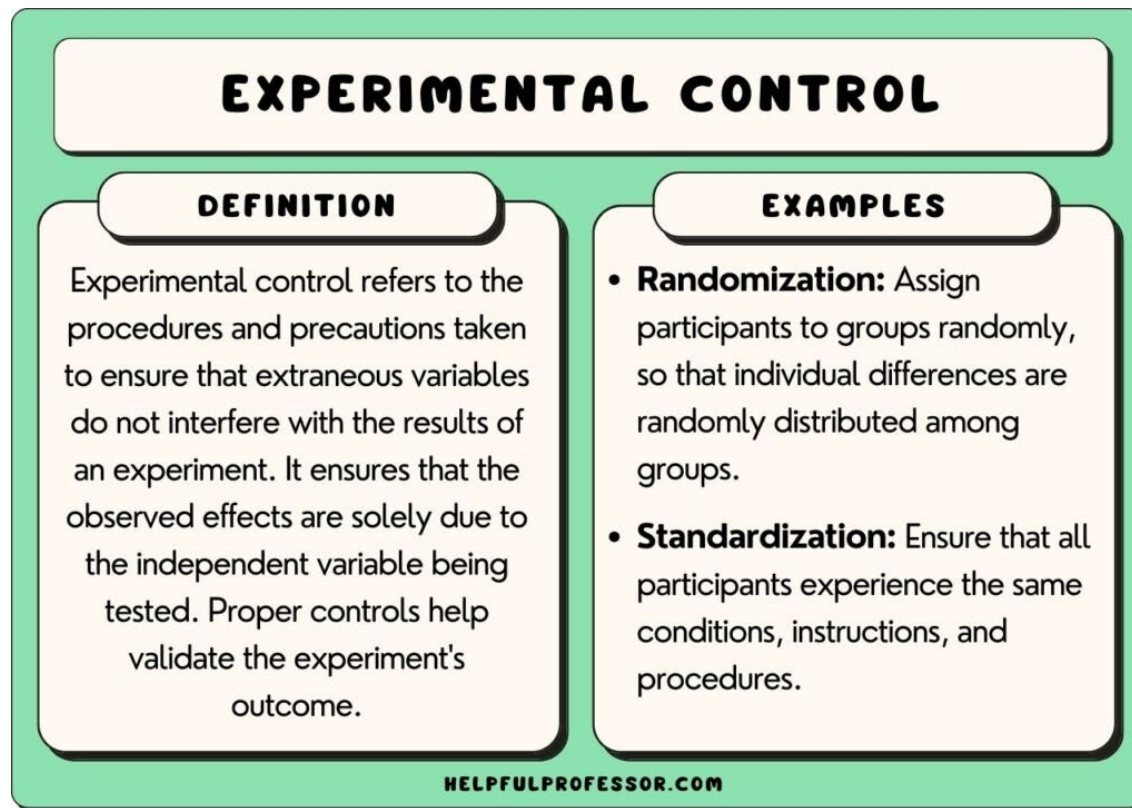
Advantages of A/B Testing

- Provides quantitative data on user preferences.



Controlled Experiments

- Studies that test usability changes under controlled conditions.



Remote Usability Testing

- Allows users to test systems from their own environment.

The screenshot displays the Prolific website interface. The top navigation bar includes the Prolific logo, links for STUDIES, SUBMISSIONS, and ABOUT YOU, along with a HELP CENTRE, an email icon, a balance of £0.00, and a language dropdown set to NL.

All studies (7 studies)

- 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 Research

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**?

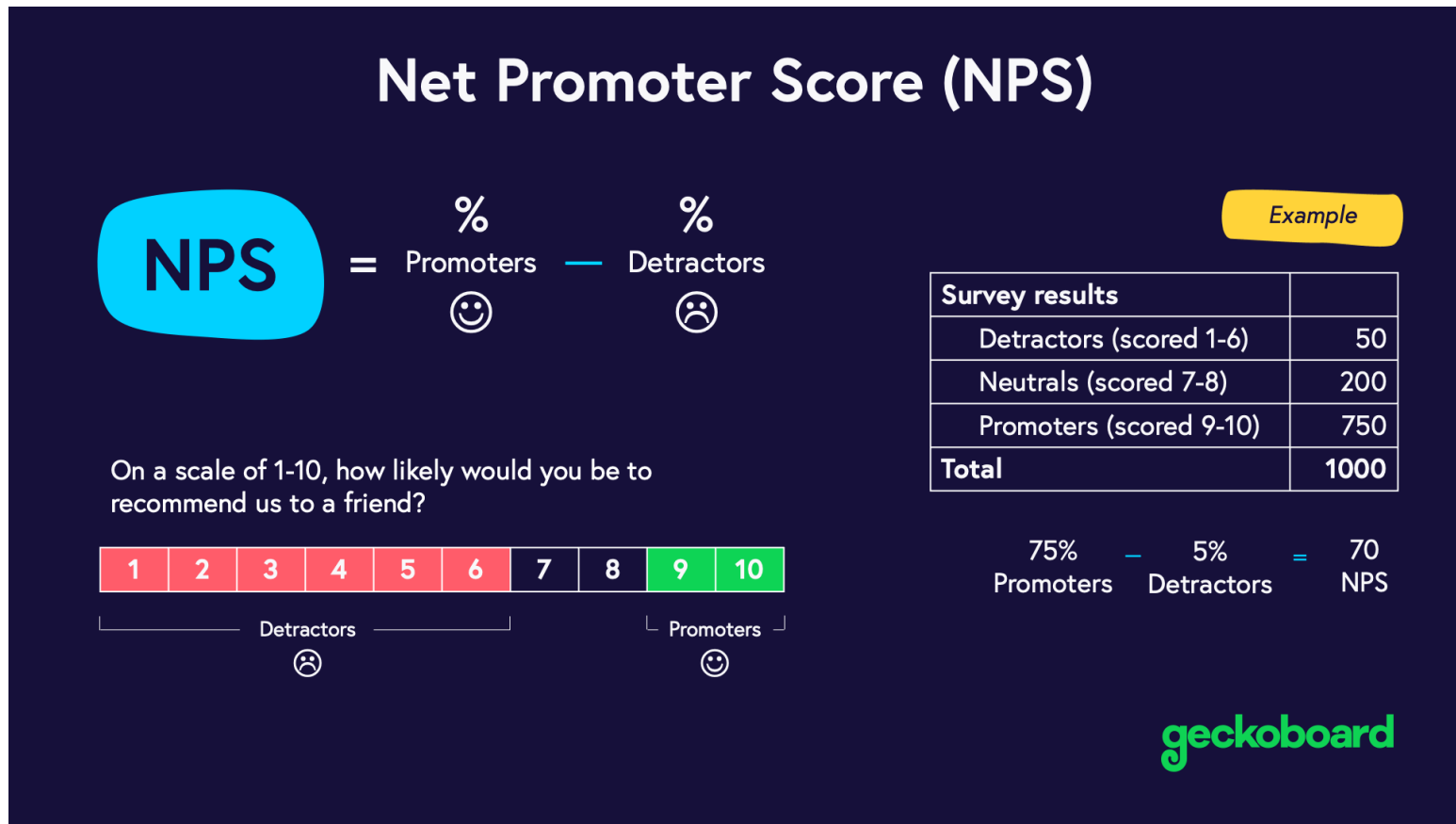


Quantitative Metrics

- 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"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Room cleanliness & hygiene	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Check-in experience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Staff behavior	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Facilities and amenities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<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)*

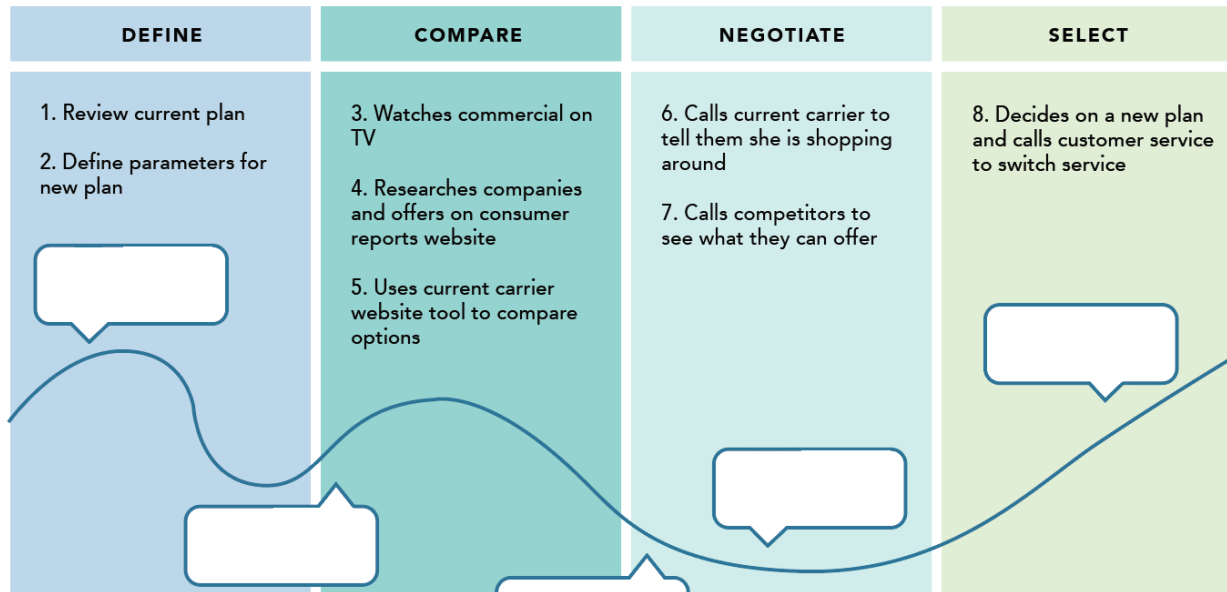


JAMIE

Scenario: Jamie needs to switch her current mobile plan. She wants a plan that can save her money without having to sacrifice usage limits.

EXPECTATIONS

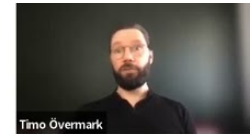
- Clear online information
- Ability to compare plan breakdowns
- Friendly and helpful customer support



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

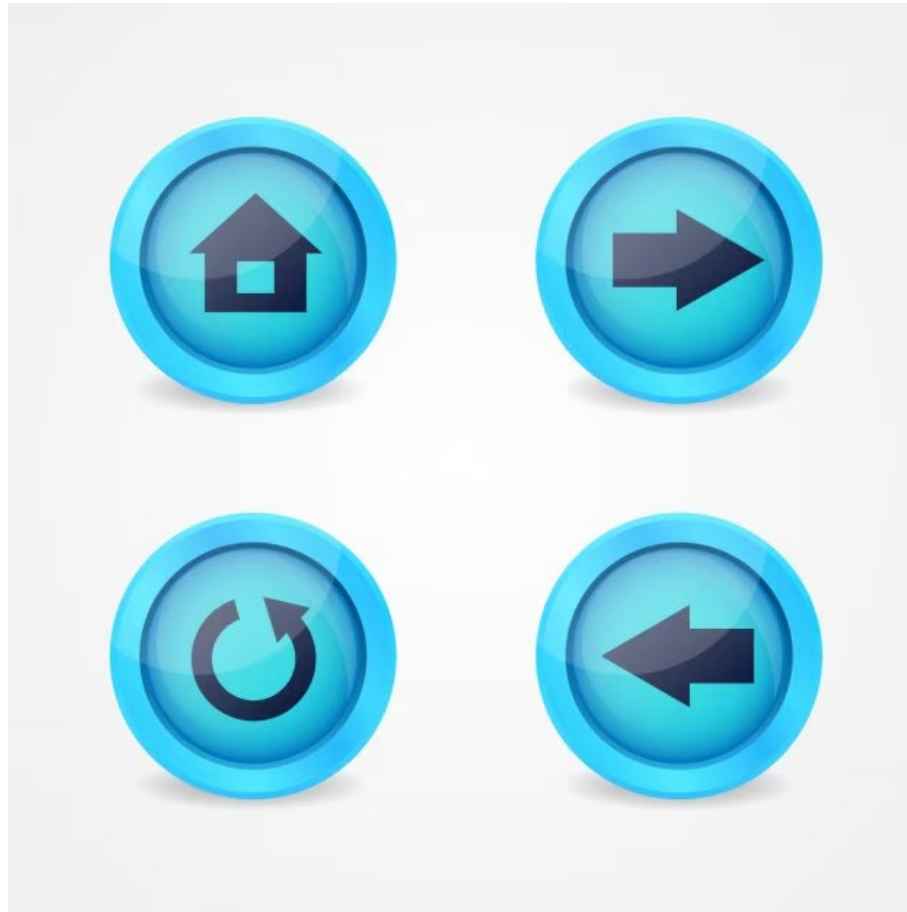


Responsive Design

- Adapts layout and functionality to different screen sizes.

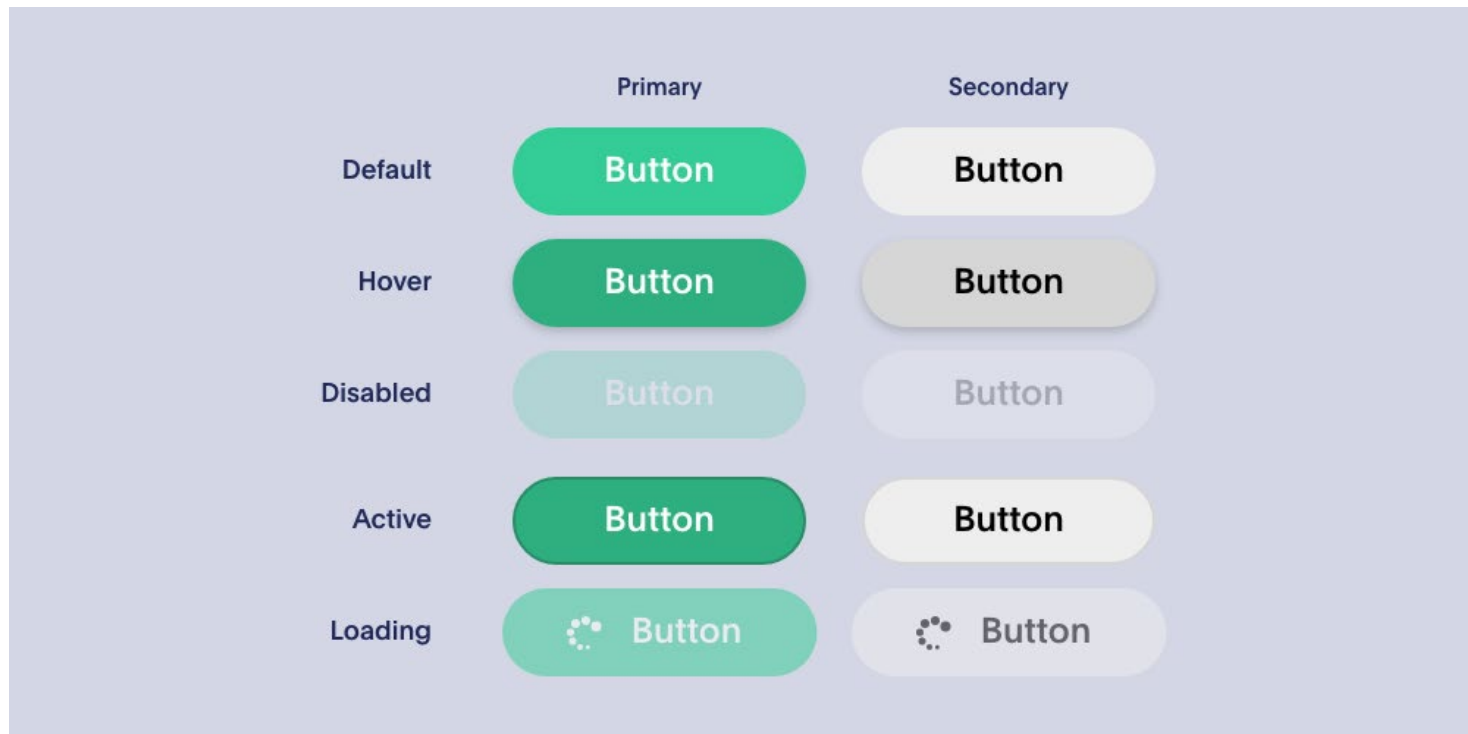
Error Recovery

- Designing for smooth recovery from errors.



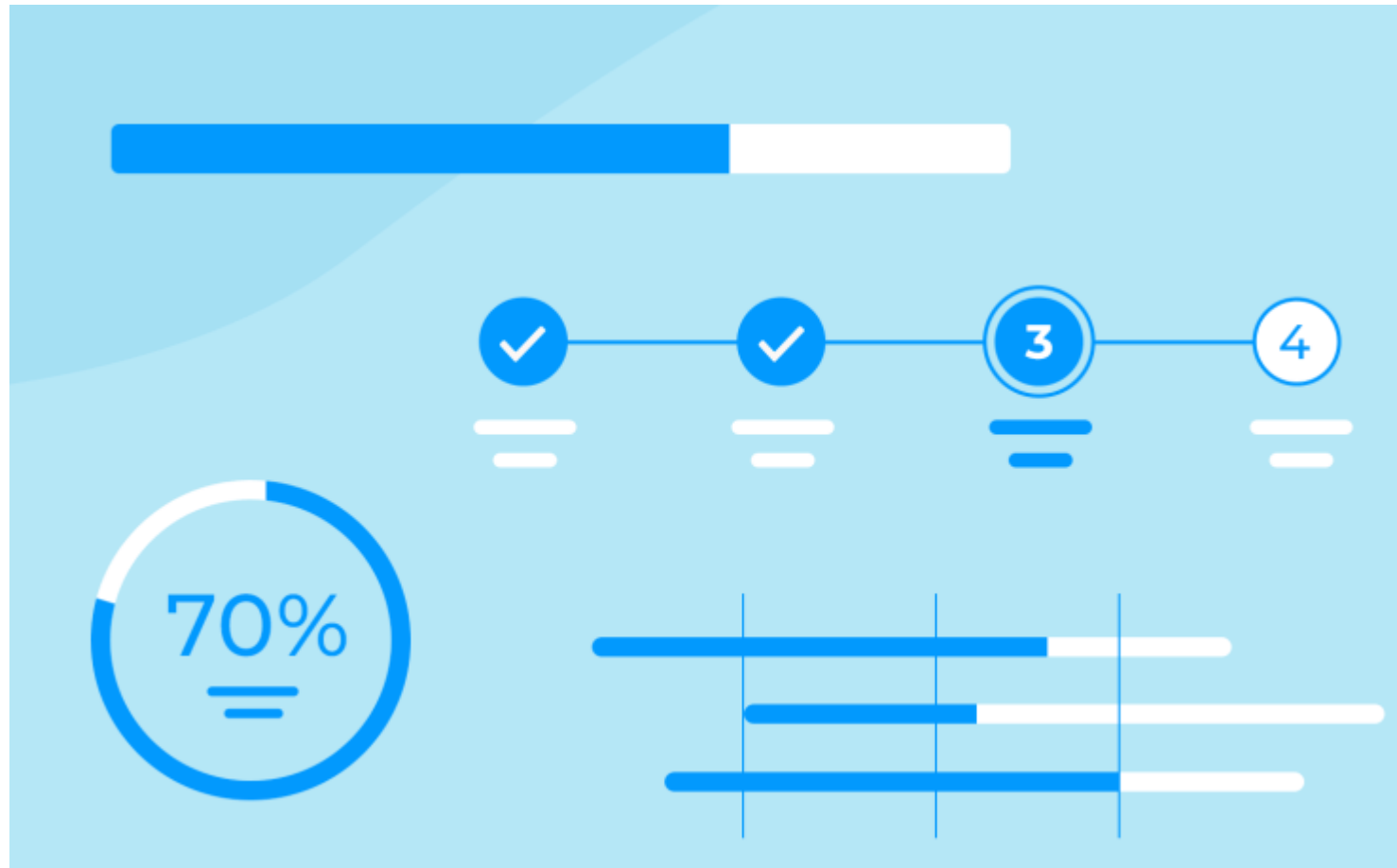
Feedback Loops

- Providing users with immediate and clear system feedback.



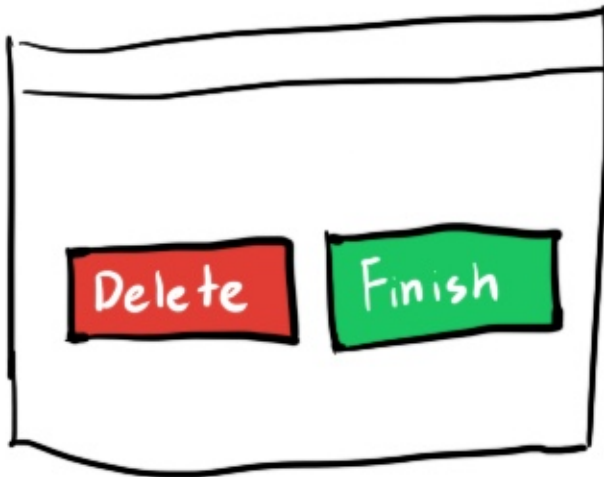
Progress Indicators

- Show users their progress in multi-step tasks.



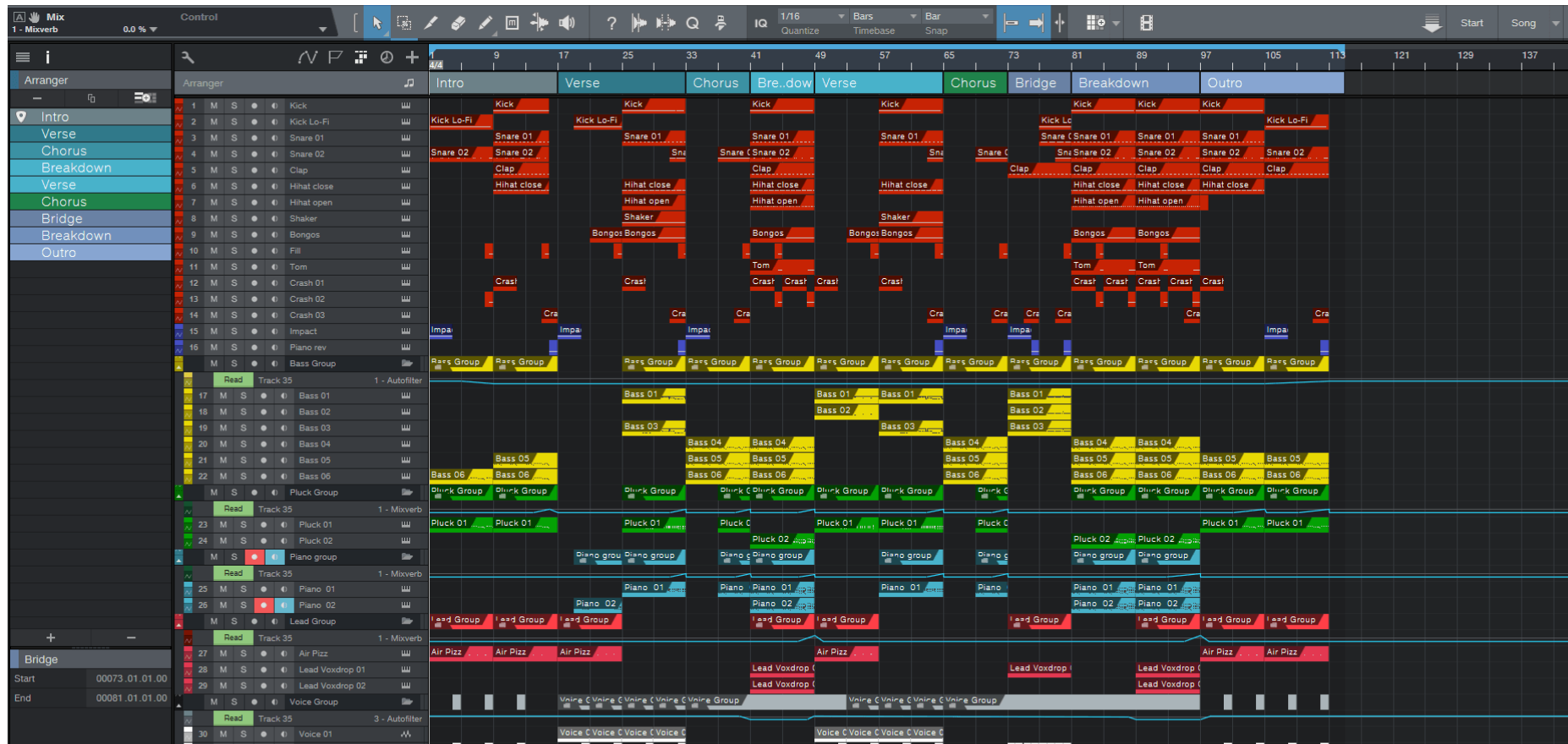
Consistency in Design

- Ensures uniformity in navigation and interaction patterns.



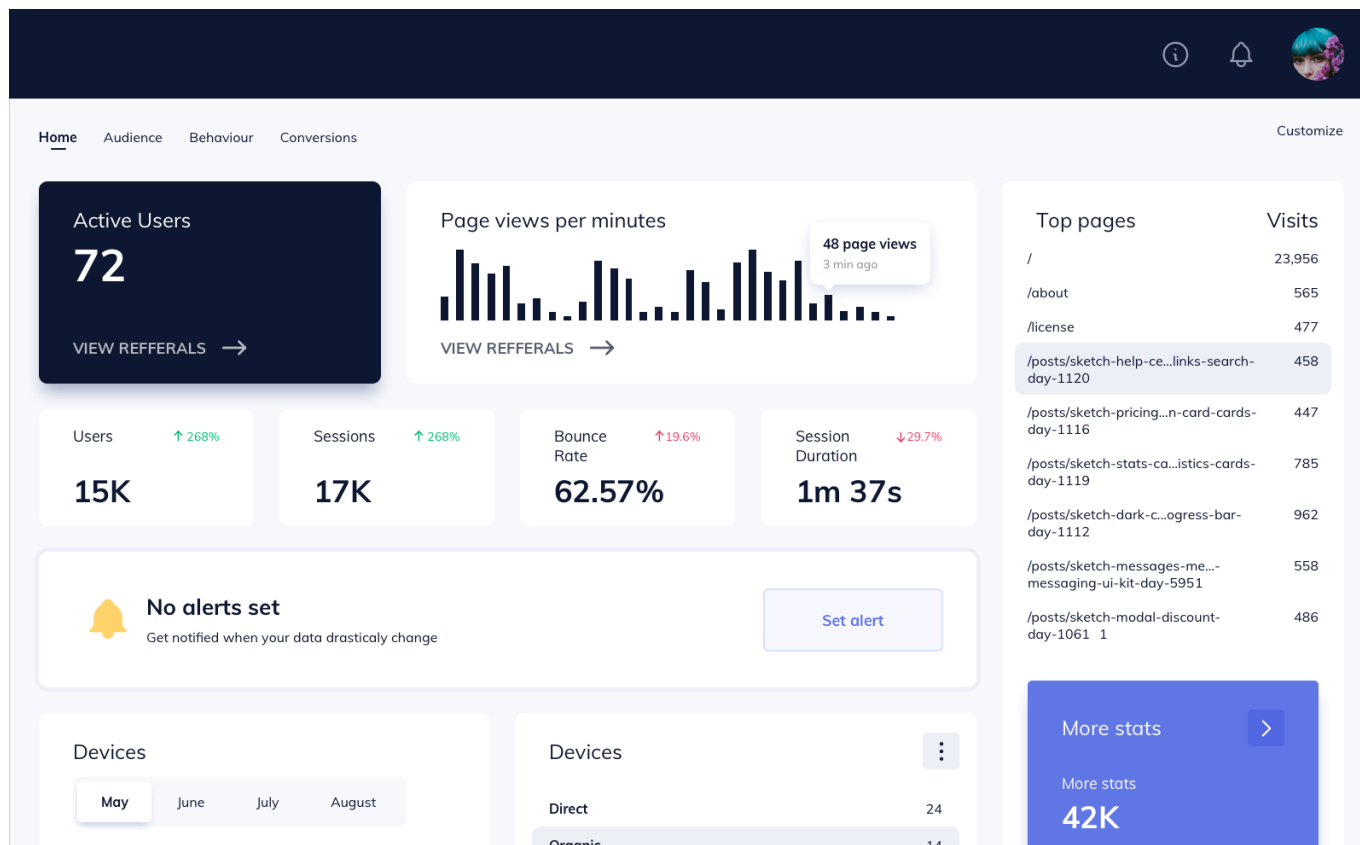
Minimizing Cognitive Load

- Reduces mental effort needed to use a system.



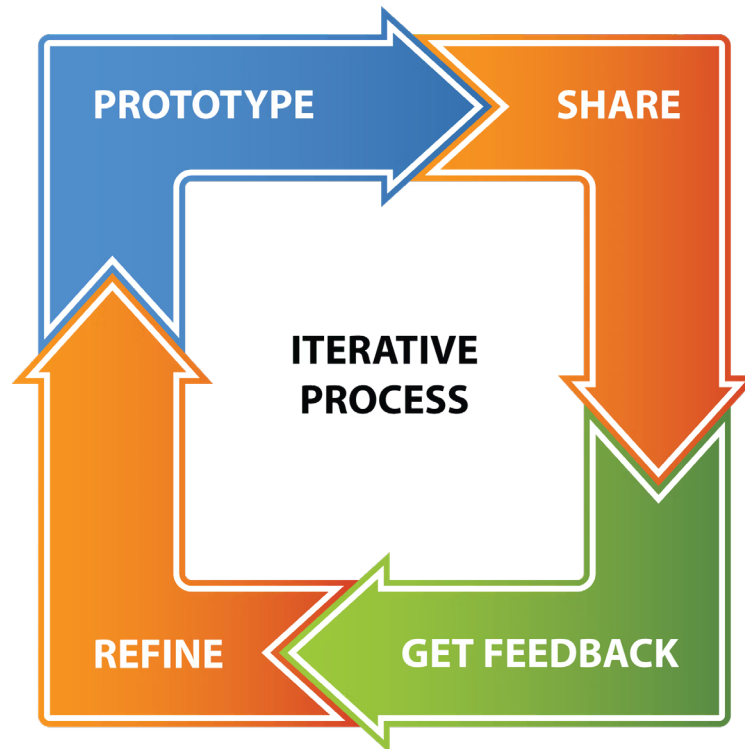
Engagement Metrics

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



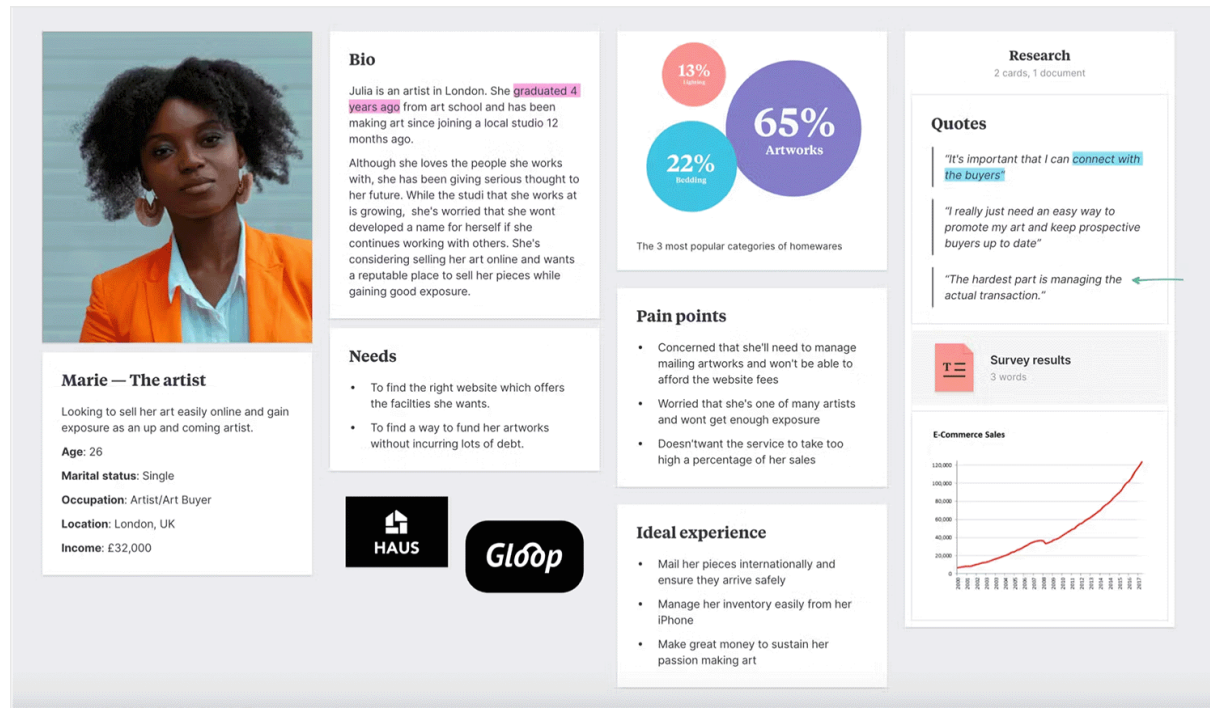
Iterative Design

- Improves usability through repeated cycles of testing and refinement.



Persona Development

- Creating user personas to guide design decisions.



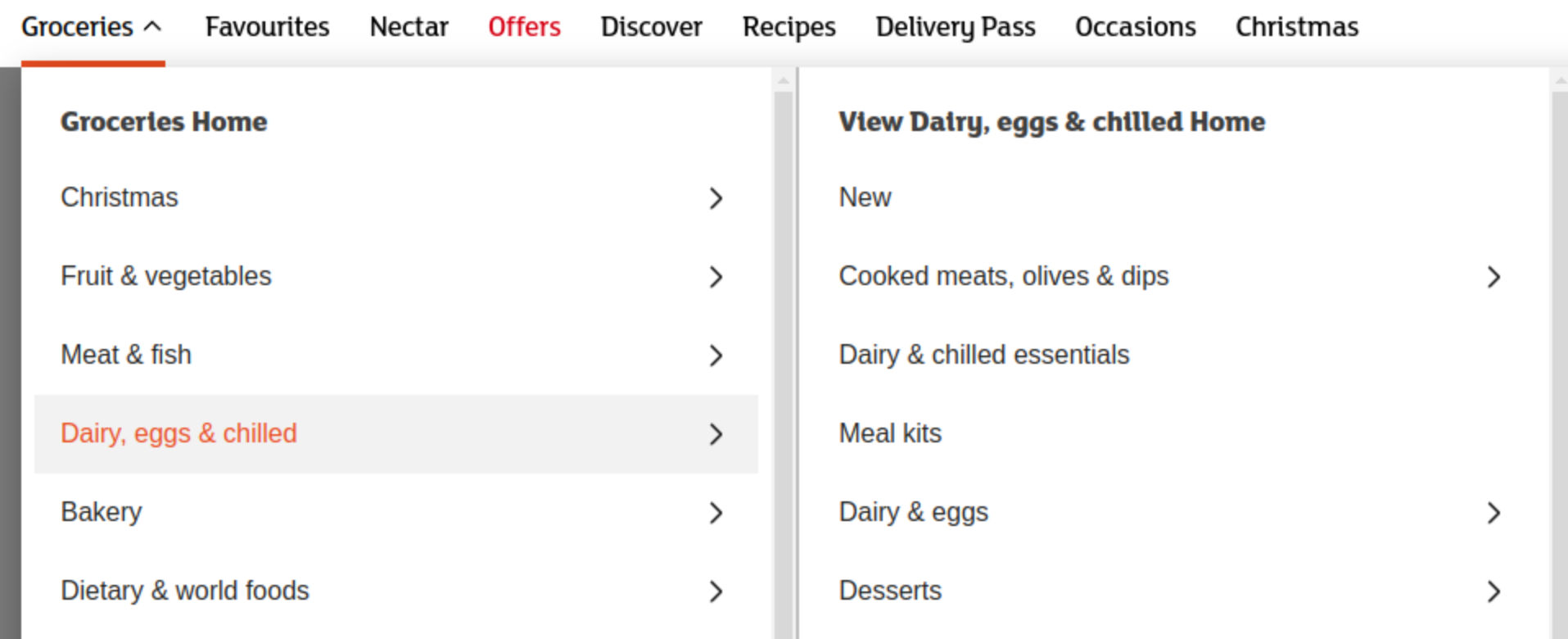
Scenario Testing

- 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.



Card Sorting

- Understanding how users categorize and label information.

Closed Card Sort

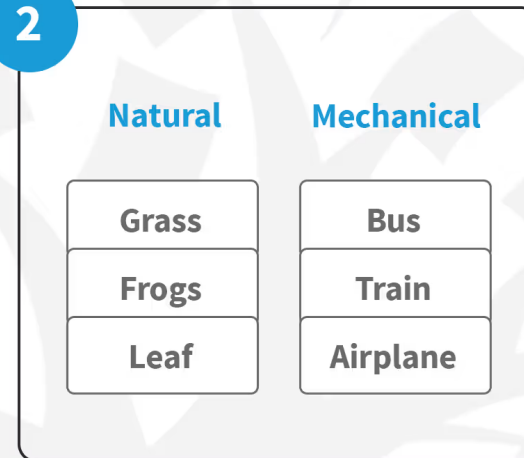


1



Participant gets a stack of cards

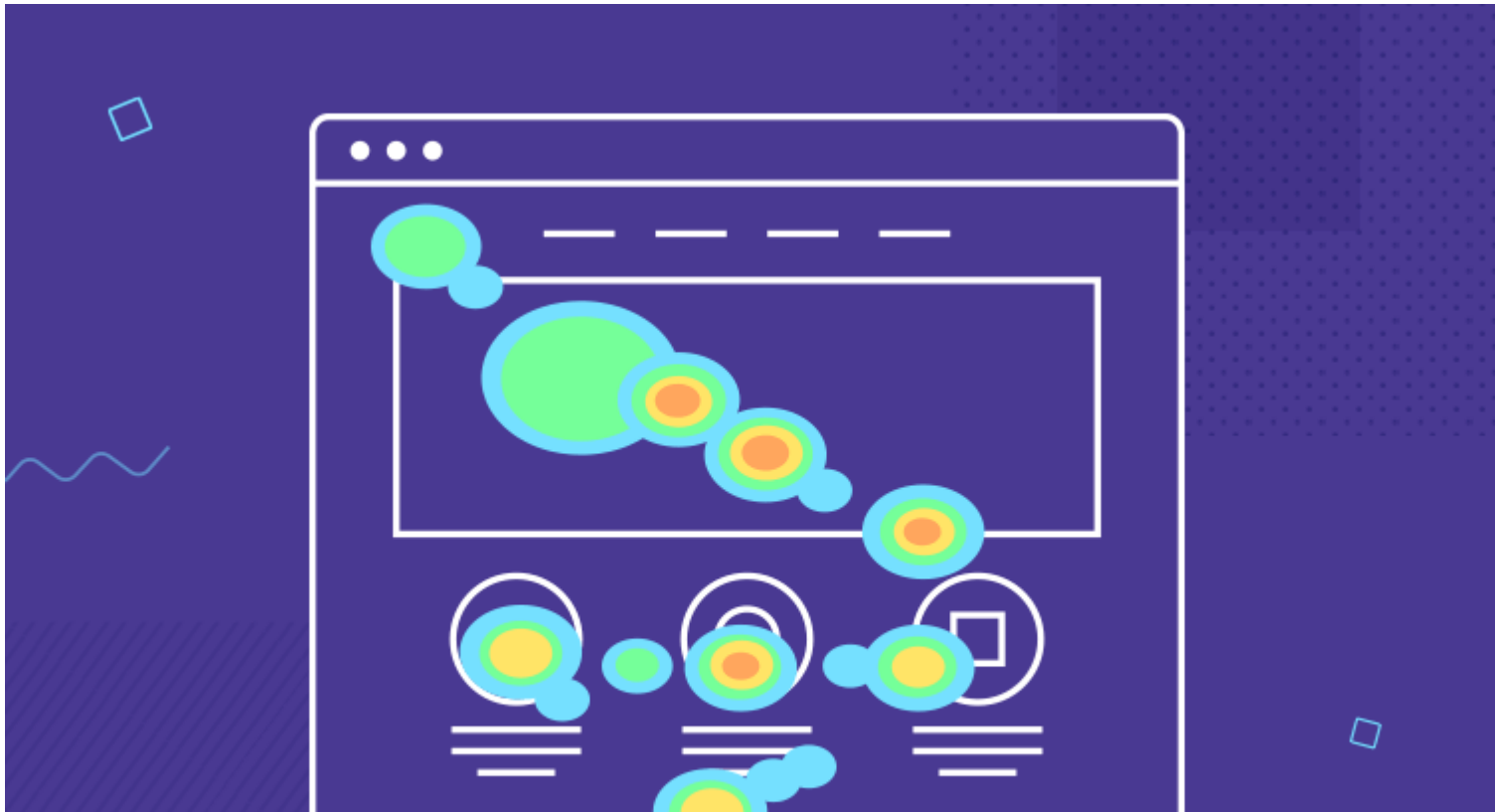
2



Participant sorts cards into groups the researchers have created

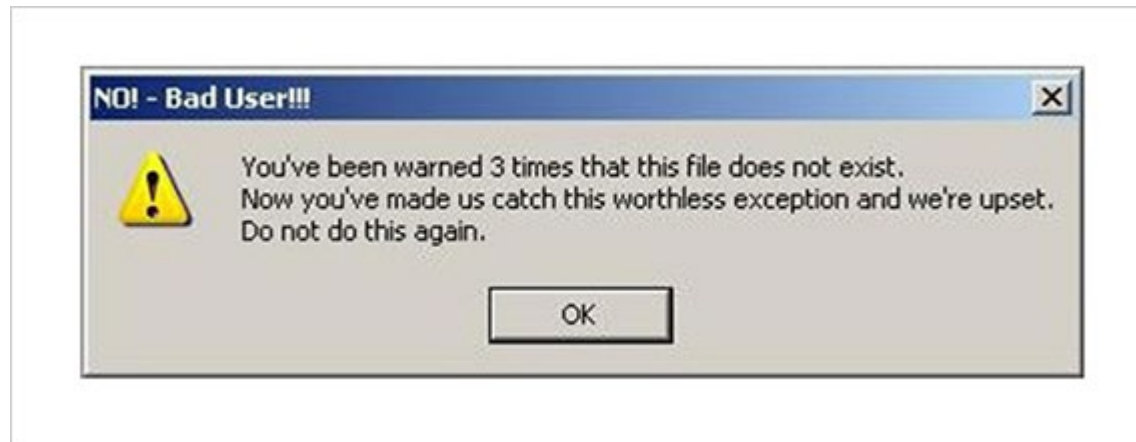
Heatmaps

- Visual representations of user interaction patterns.



Error Messages

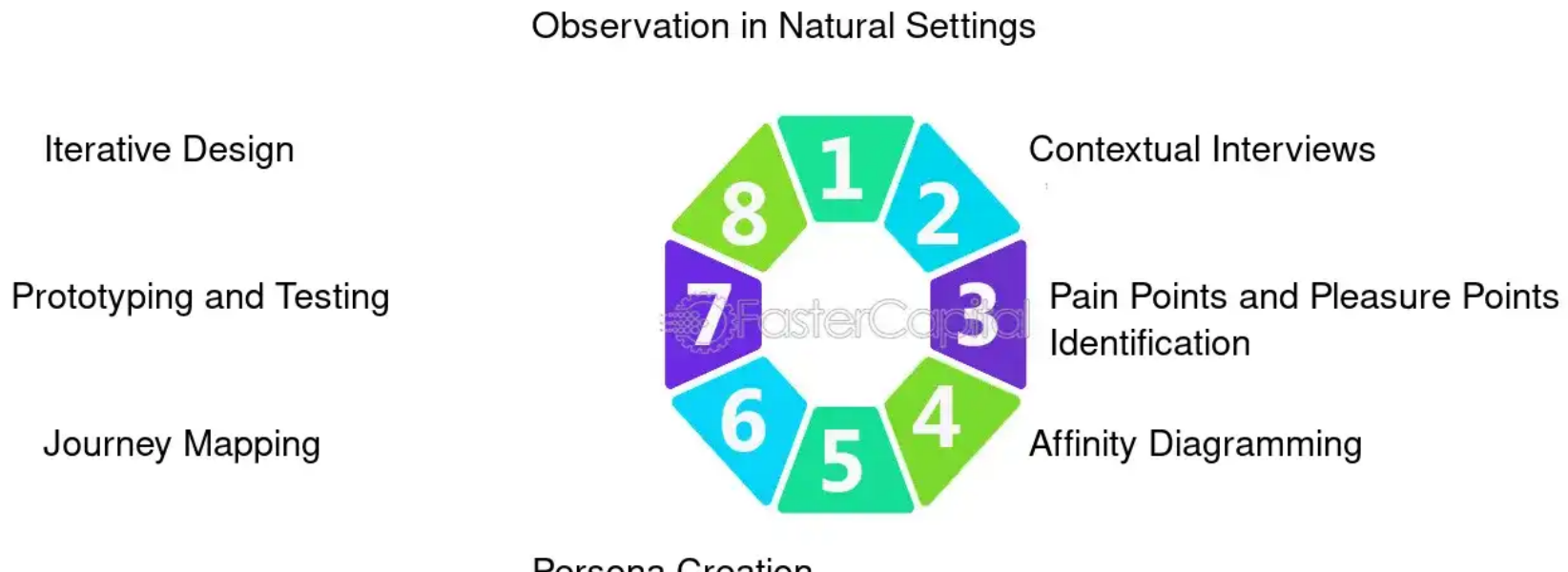
- Designing clear and actionable error messages.



Contextual Inquiry

- Observing users in their natural environment to gather insights.

Integrating Contextual Inquiry into Your Design Thinking Process



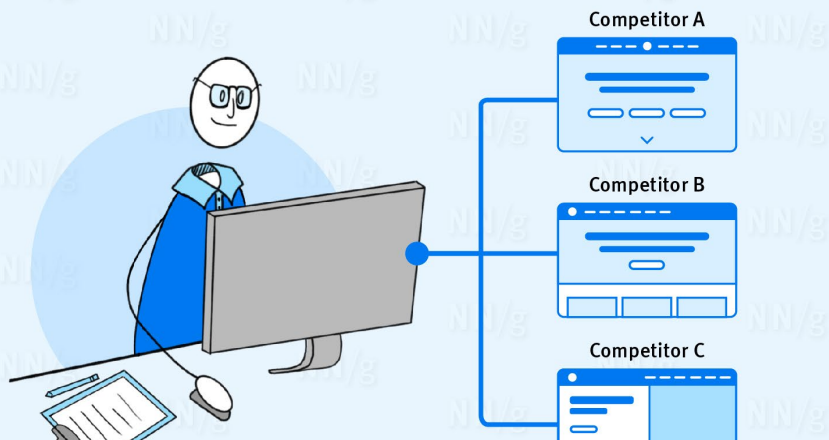
Competitive Usability Analysis

- Benchmarking usability against competitors.

2 Types of Competitive Usability Evaluations

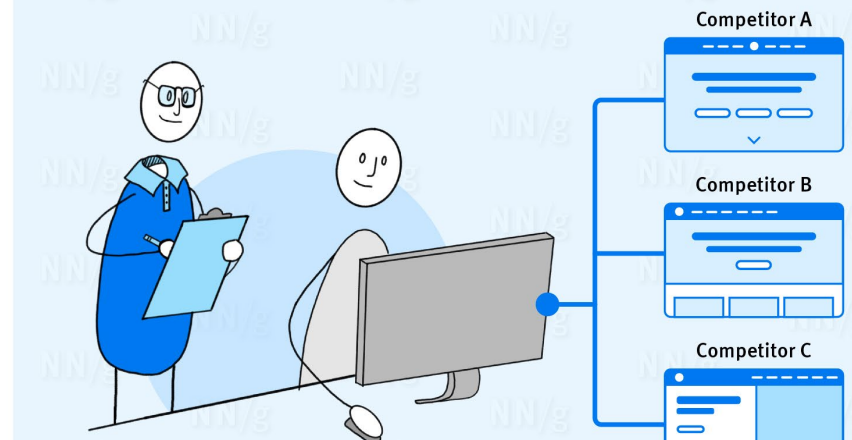
Competitive Reviews

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 the Goldsmiths University of London website. The main heading is "Different is what we do" with a subheading "Visit us at our upcoming autumn Open Days". A "Book your place" button is visible. The footer contains links for "Search our courses", "Open Days and visits", "Accommodation options", and "Chat with our students".

Overlaid on the right is the Chrome DevTools Network tab, showing a list of network requests. The table below represents the data from this tab:

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.p...	0 B	7 ms
sa.jpeg	(blocked:ot...	fetch	ajaxRequestInterceptor.p...	0 B	7 ms
playlist/?id=11149680	200	xhr	ajaxRequestInterceptor.p...	28.3 kB	786 ms
collect?v=2&tid=G-375J4LLPD0>m=45je4bk...	204	fetch	ajaxRequestInterceptor.p...	543 B	762 ms
v?id=www.gold.ac.uk&p=CookieControl%20Si...	200	xhr	ajaxRequestInterceptor.p...	(disk cache)	3 ms
attribution_trigger?pid=655226&time=17325...	(blocked:ot...	js?id=G-375J4LLPD0&l=de	insight.min.js:1	0 B	1 ms
collect?v=2&tid=G-375J4LLPD0>m=45je4bk...	204	ping	js?id=G-375J4LLPD0&l=de	48 B	565 ms
saq_px?uid=a3OKr1J_jeNAK3AK_NYExw&is.j...	(blocked:ot...	xhr	ajaxRequestInterceptor.p...	0 B	2 ms
collect?v=1&_v=1011&a=484324415&t=pagevi...	200	xhr	ajaxRequestInterceptor.p...	26 B	581 ms
collect?v=2&tid=G-375J4LLPD0>m=45je4bk...	204	fetch	ajaxRequestInterceptor.p...	20 B	589 ms
set_partitioned_cookie?avid=772915089.173...	200	ping	collect	0 B	565 ms
clarity.js	200	script	5h547vv898:1	(memory ca...)	0 ms
main.MWQ3ODVYV2ZhMA.js	200	script	sdks?jsdkid=B5G11MIHO...	(memory ca...)	0 ms
identify_45dd5971.js	200	script	main.MWQ3ODVYV2ZhMA	(memory ca...)	0 ms
pixel	200	ping	main.MWQ3ODVYV2ZhMA	873 B	583 ms

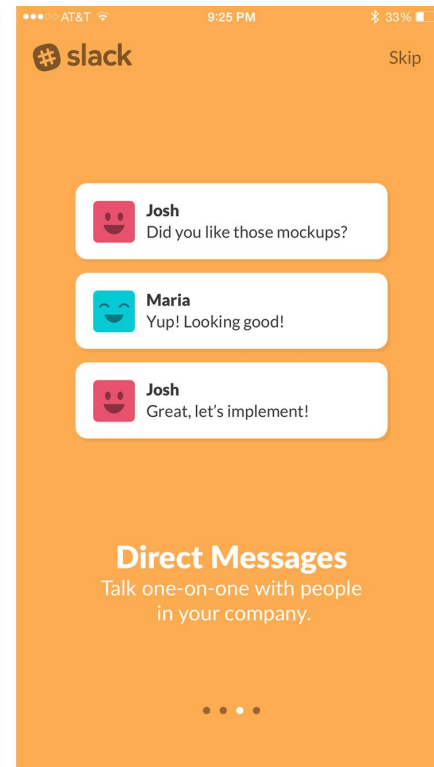
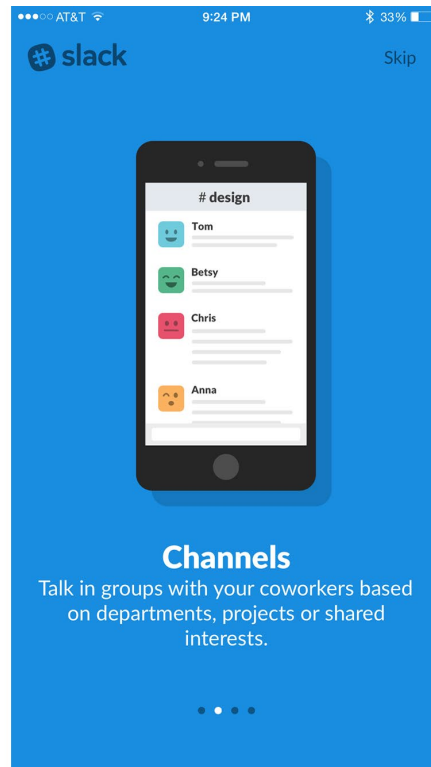
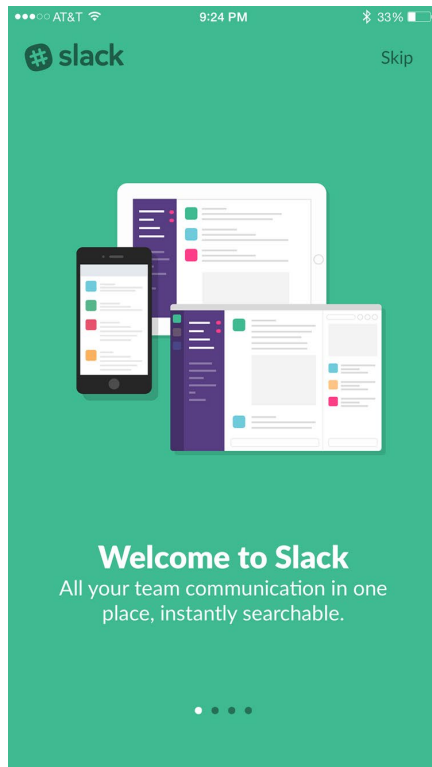
Microinteractions

- 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/canvasutorial
// This code is still relatively complicated -- if 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;

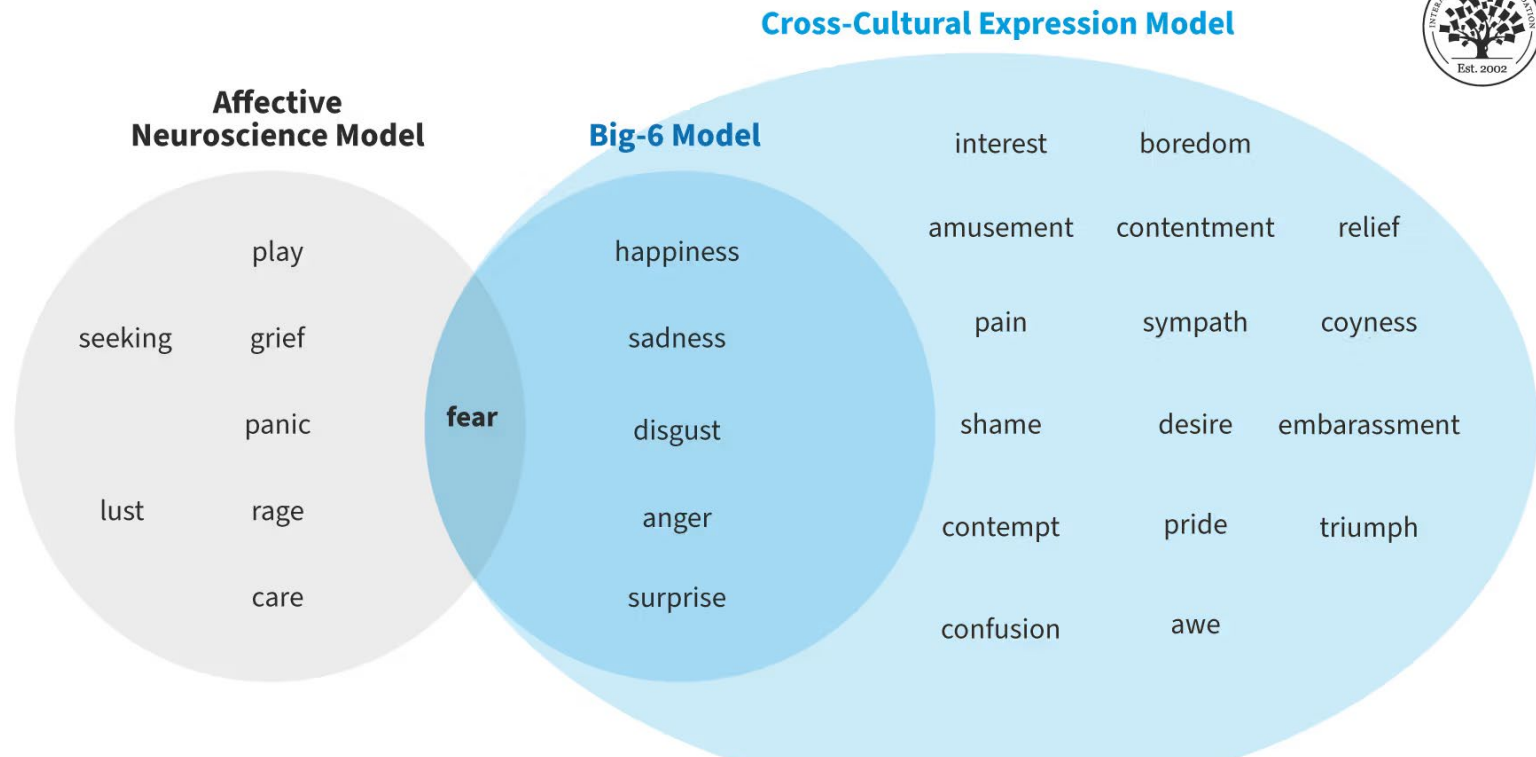
for (var y=0; y<20; y++) {
  bricks[y] = [];
  for (var x=0; x<20; x++) {
    bricks[y][x] = true;
  }
}

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

function initGame() {
  setValues();
  paddleX = 100;
  ballX = 100;
  ballY = 100;
  ballDirx = 1;
  ballDiry = 1;
  restart = true;
}
```

Emotional Design

- Creating designs that evoke positive emotions.



Future Trends in Usability

- Exploring innovations like AI and VR in usability testing.

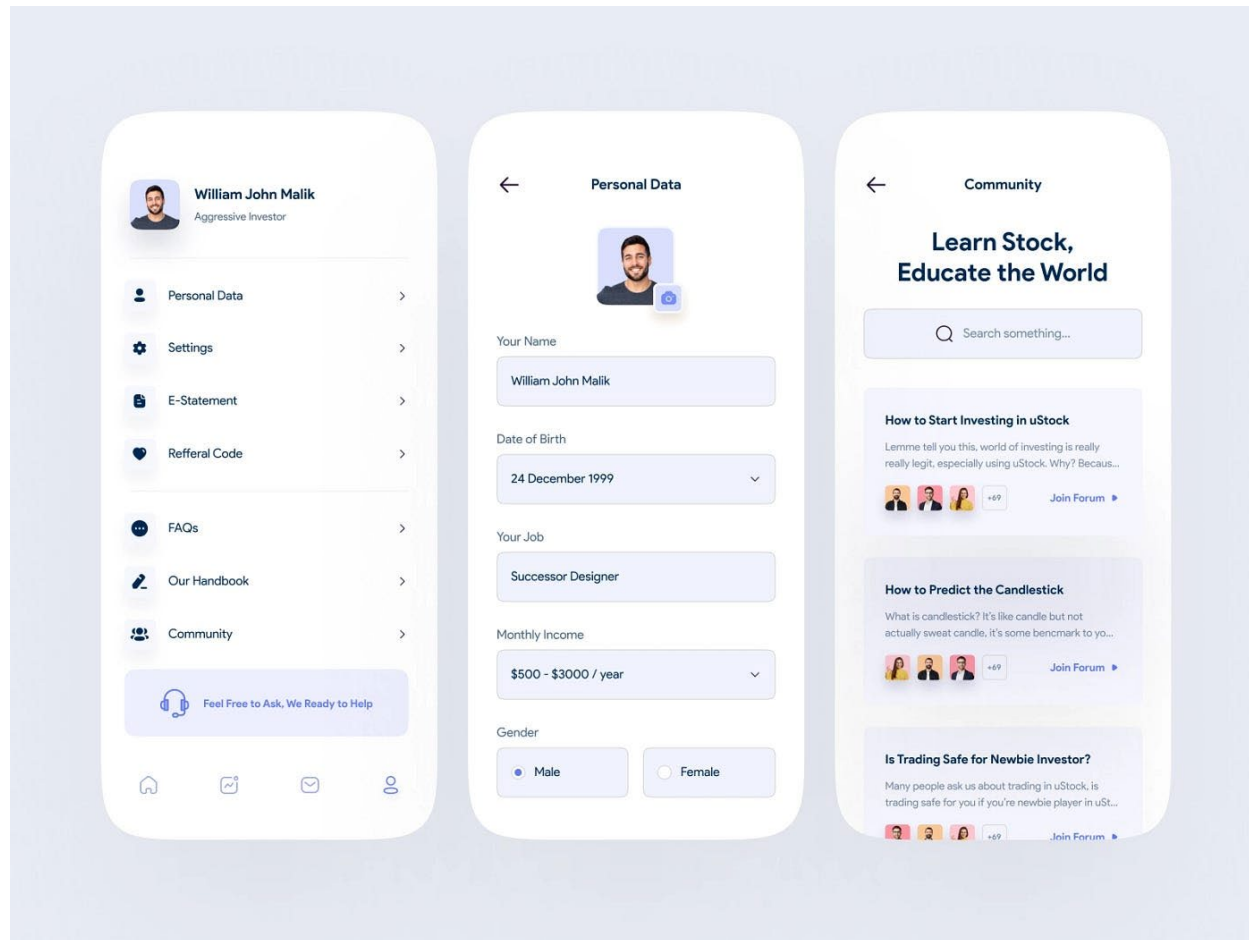
Cross-Cultural Usability

- 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?