

6.1040: Software Design

Evaluating Design

Arvind Satyanarayan & Daniel Jackson

Observe
users.

Conduct
interviews.

Seek **stories.**



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Conduct
interviews.

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Needfinding

Diverge

Define your goals and **point of view.**

Go wide to explore a **large quantity and diversity of ideas.**

Apply **VSD/ethical lens** to generate additional design ideas.

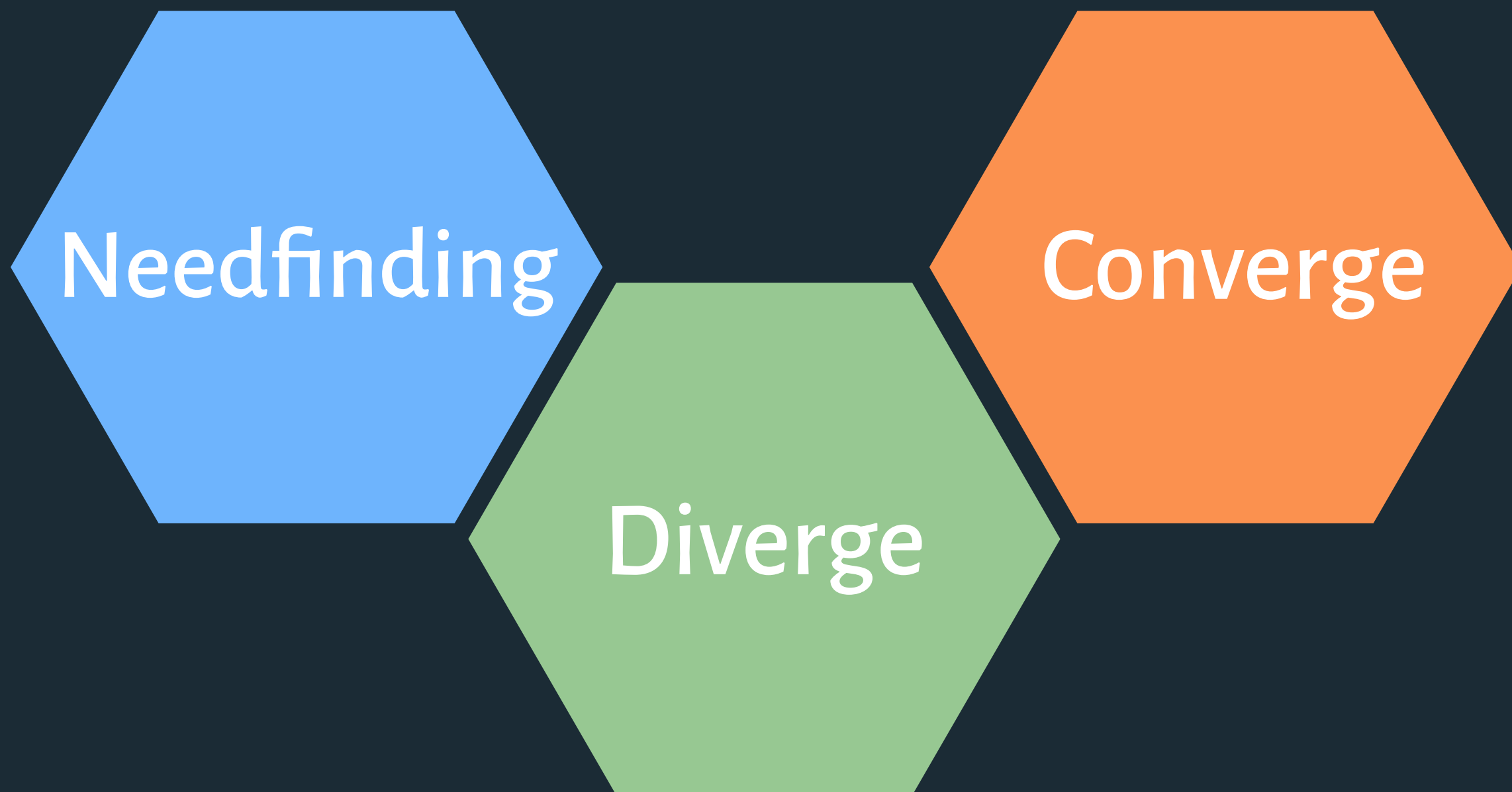
Using **concept design** to winnow and refine ideas.

Explore tradeoffs and iterate.

Observe users.

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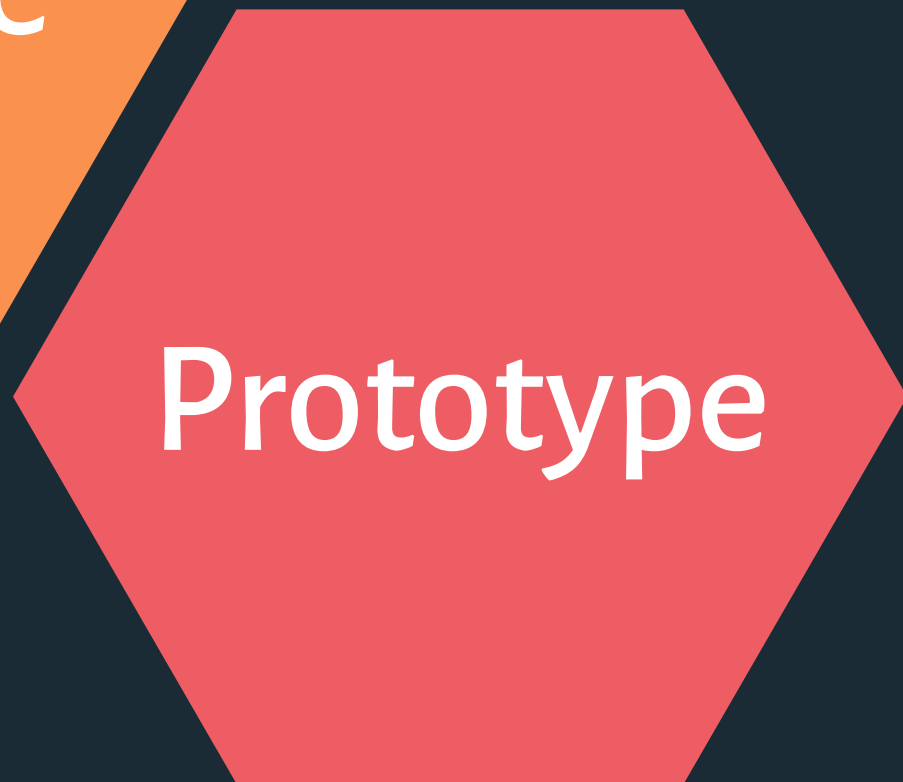
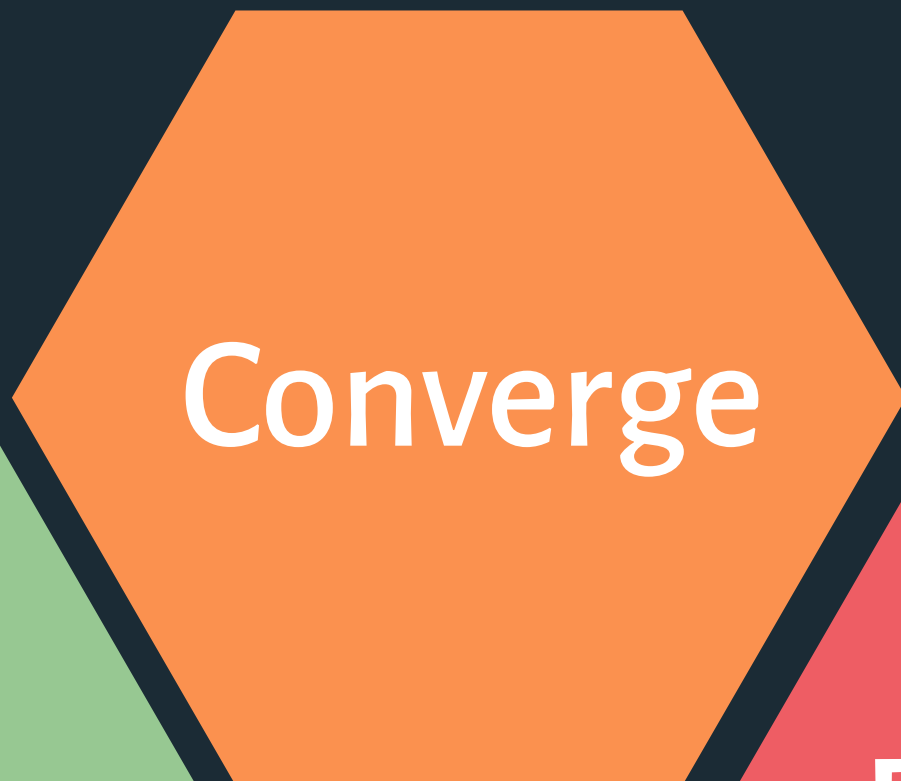
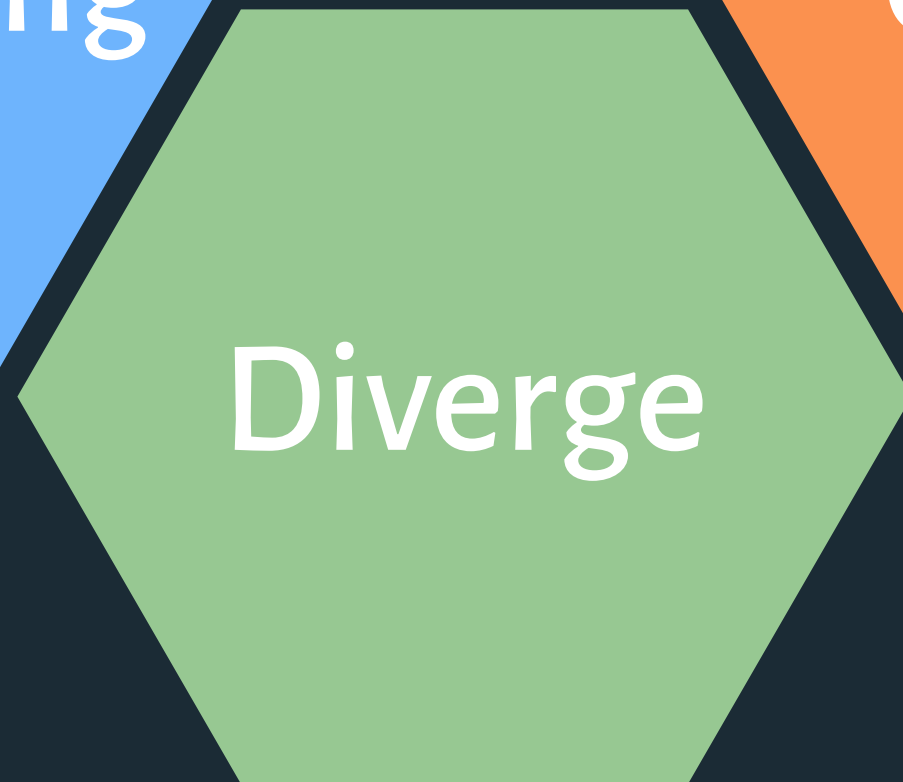


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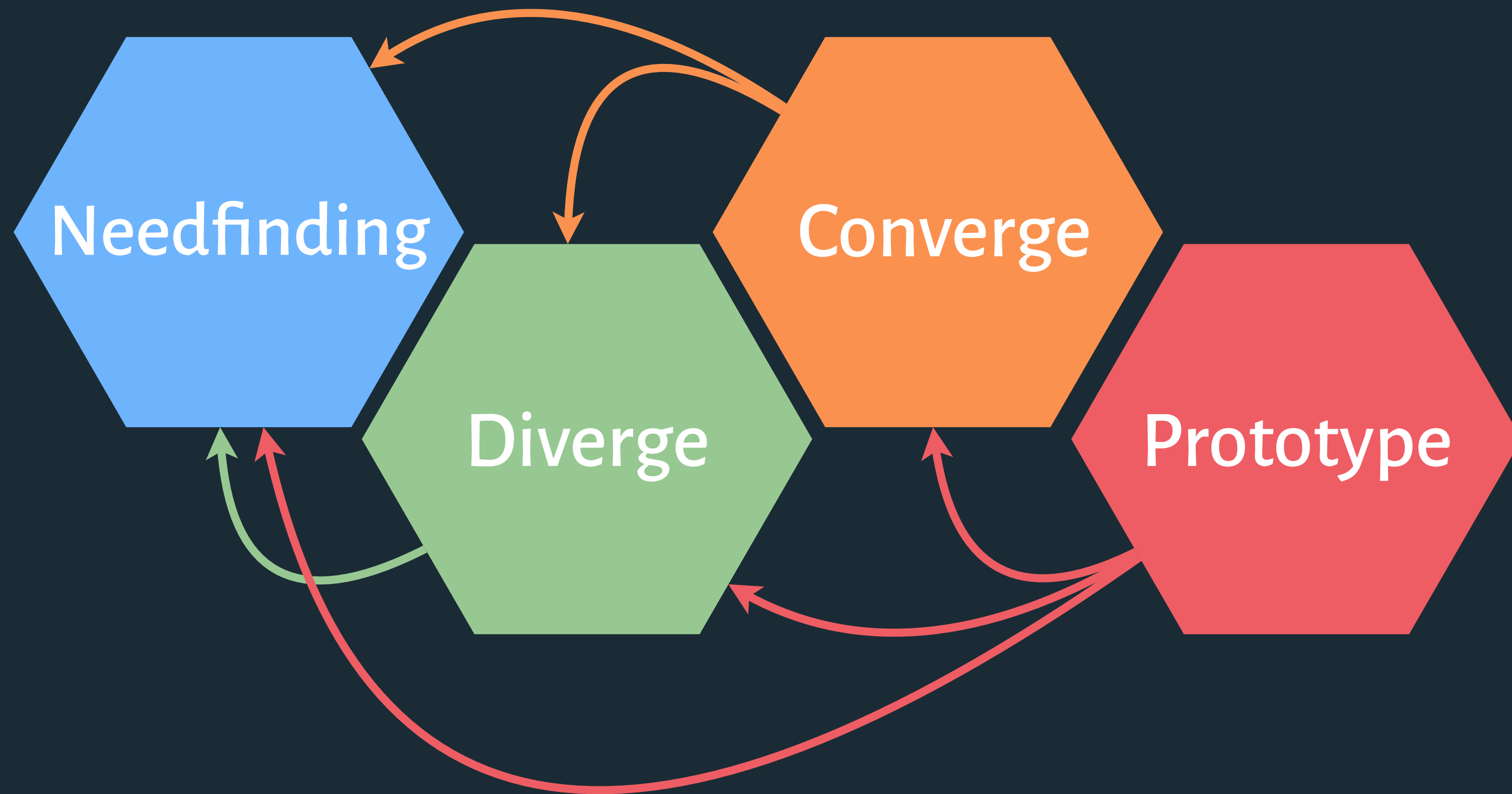
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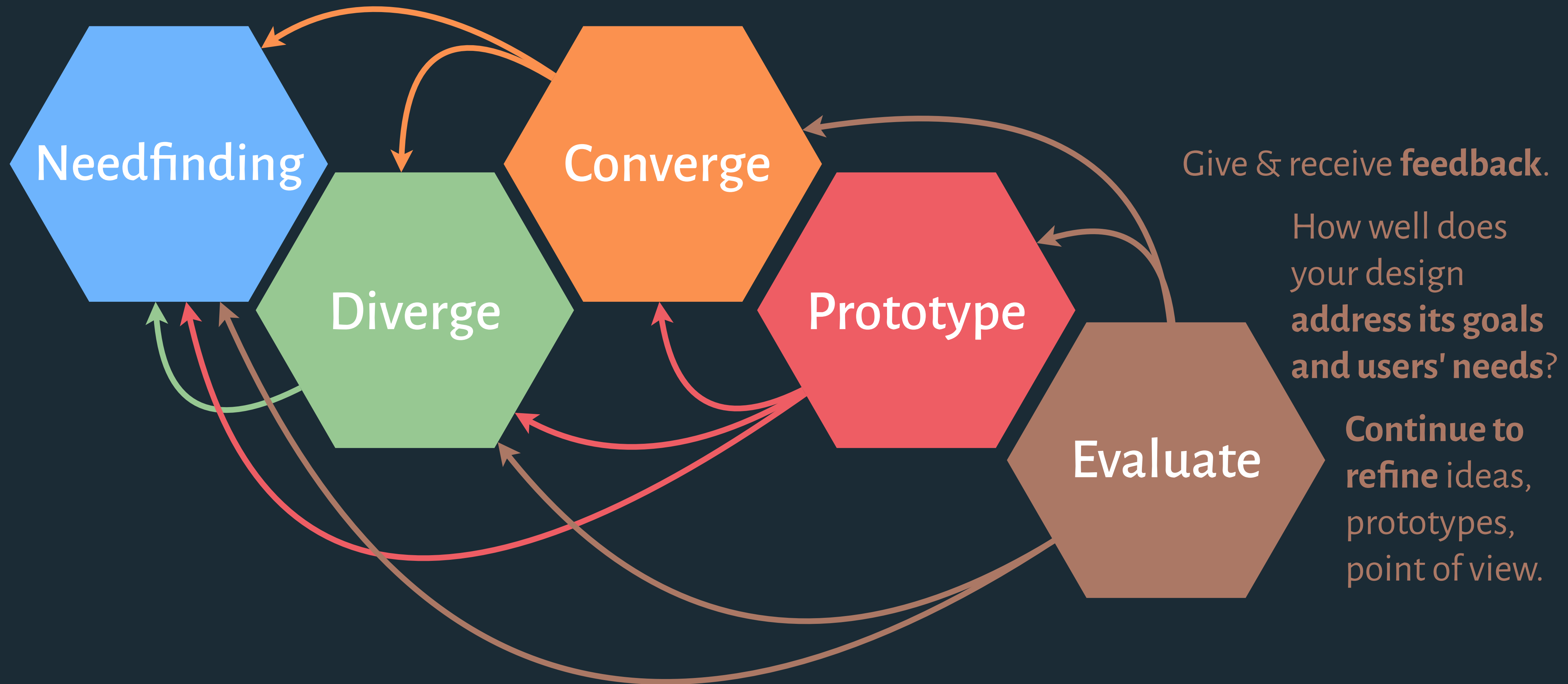
Explore the **feasibility** of design
ideas through **mixed fidelities**
(i.e., sketches, wireframes,
implementation).


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Apply **VSD/ethical lens** to generate
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*cost
(money,
time,
effort)*

design fidelity (realism) / stage of the design process

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Heuristic Evaluation

design fidelity (realism) / stage of the design process

1 Visibility of System Status

Designs should keep users informed about what is going on, through appropriate, timely feedback.

Interactive mall maps have to show people where they currently are, to help them understand where to go next.

2 Match between System and the Real World

The design should speak the users' language. Use words, phrases, and concepts familiar to the user, rather than internal jargon.

Users can quickly understand which stovetop control maps to each heating element.

5 Error Prevention

Good error messages are important, but the best designs carefully prevent problems from occurring in the first place.

Guard rails on curvy mountain roads prevent drivers from falling off cliffs.

8 Aesthetic and Minimalist Design

Interfaces should not contain information which is irrelevant. Every extra unit of information in an interface competes with the relevant units of information.

A minimalist three-legged stool is still a place to sit.

Nielsen Norman Group Jakob's Ten Usability Heuristics

3 User Control and Freedom

Users often perform actions by mistake. They need a clearly marked "emergency exit" to leave the unwanted action.

Just like physical spaces, digital spaces need quick "emergency" exits too.

6 Recognition Rather Than Recall

Minimize the user's memory load by making elements, actions, and options visible. Avoid making users remember information.

People are likely to correctly answer "Is Lisbon the capital of Portugal?".

9 Recognize, Diagnose, and Recover from Errors

Error messages should be expressed in plain language (no error codes), precisely indicate the problem, and constructively suggest a solution.

Wrong-way signs on the road remind drivers that they are heading in the wrong direction.

4 Consistency and Standards

Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions.

Check-in counters are usually located at the front of hotels, which meets expectations.

7 Flexibility and Efficiency of Use

Shortcuts — hidden from novice users — may speed up the interaction for the expert user.

Regular routes are listed on maps, but locals with more knowledge of the area can take shortcuts.

10 Help and Documentation

It's best if the design doesn't need any additional explanation. However, it may be necessary to provide documentation to help users complete their tasks.

Information kiosks at airports are easily recognizable and solve customers' problems in context and immediately.

Guidelines for Human-AI Interaction



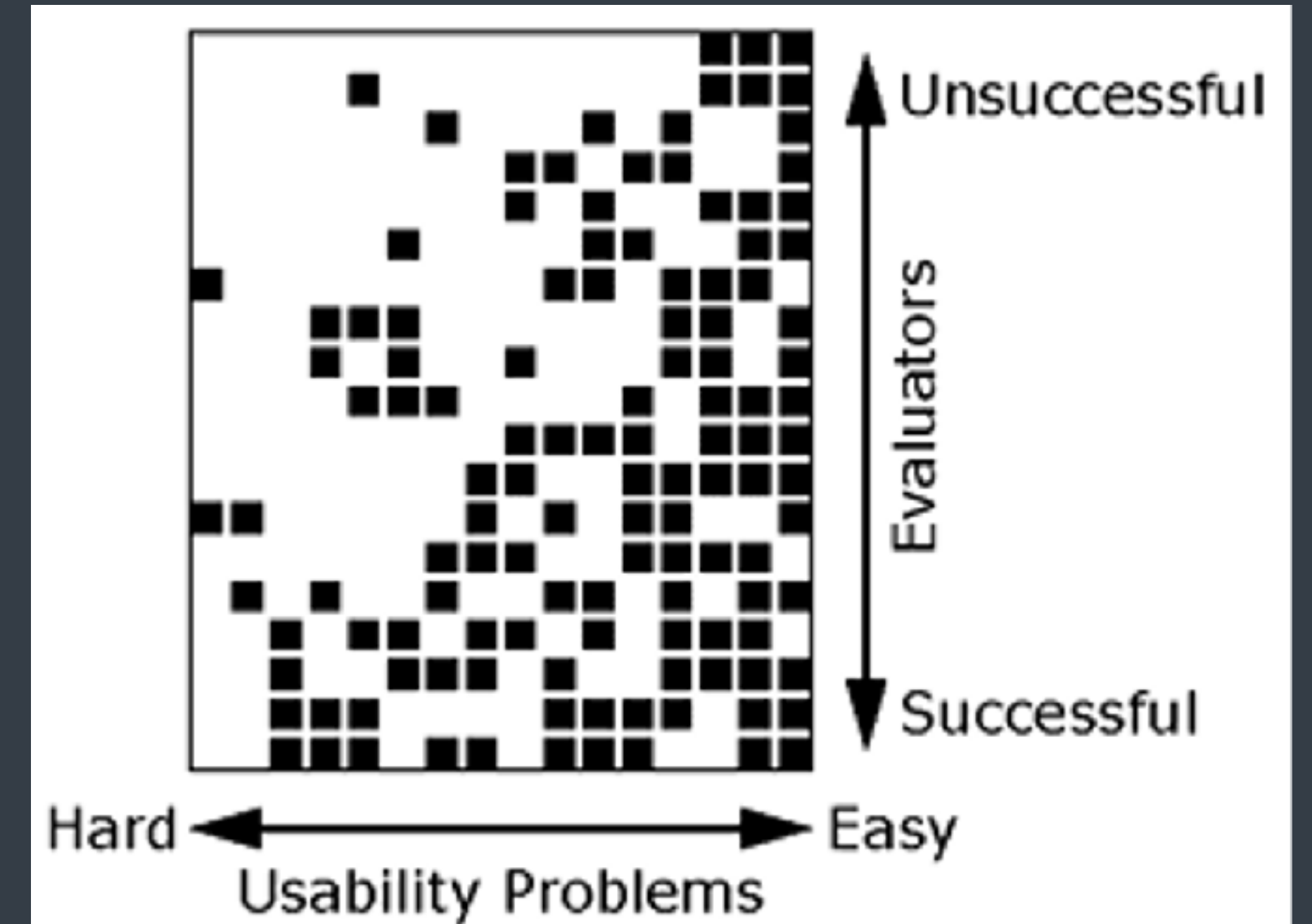
Heuristic Evaluation

Process.

Convene a small set of **multiple evaluators** (~3-5) to examine UI.

Independently step through the design, check compliance with heuristics.

Only communicate at the end.



From Jakob Nielsen, 1992.

Heuristic Evaluation

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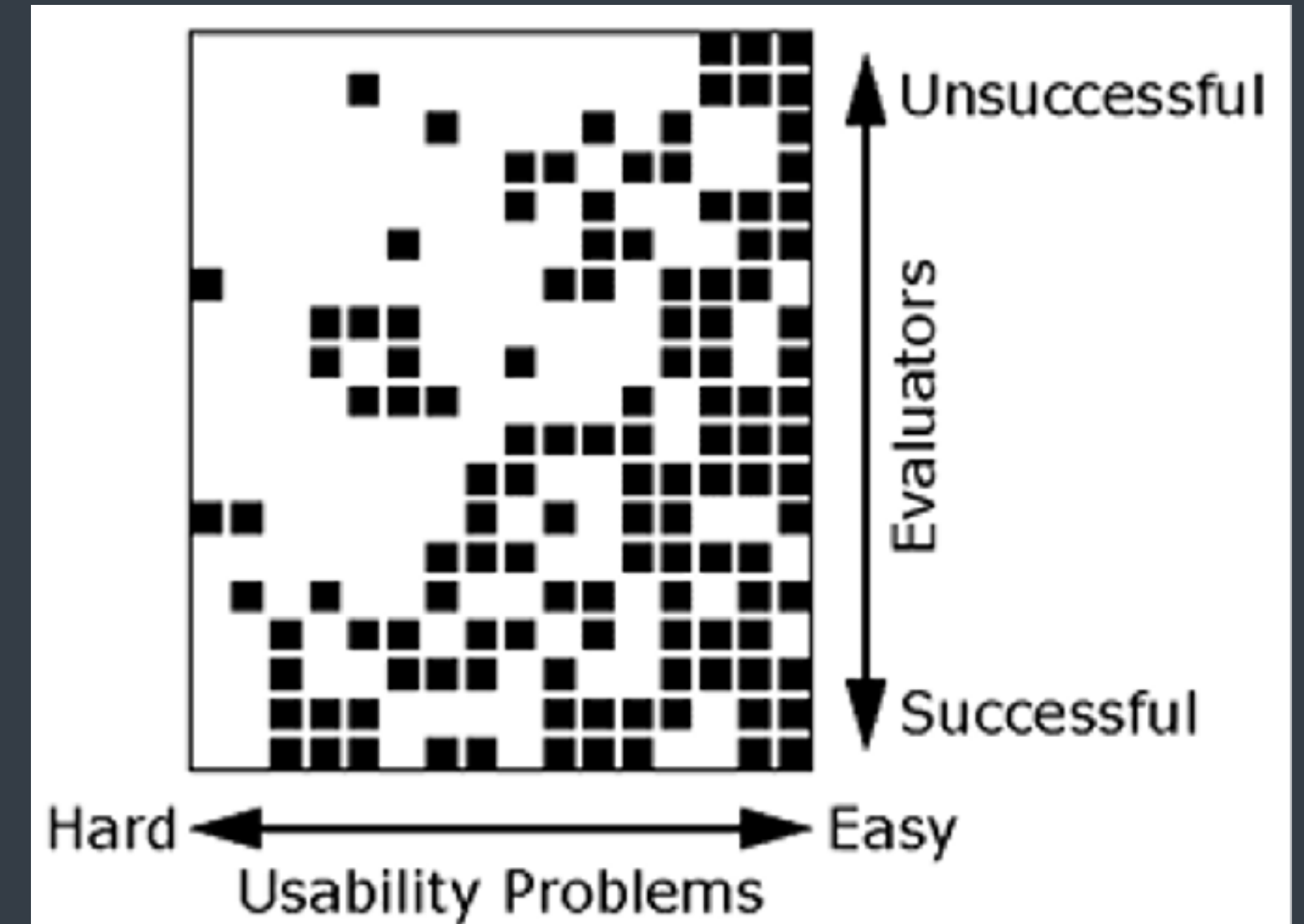
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Pros and Cons.

- ✓ Faster and cost effective.
- ✓ Can be conducted for any level of fidelity.
- ✓ Allows user testing to focus on bigger issues.
- ✗ May miss problems or find "false positives"



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Heuristic Evaluation &
Cognitive Walkthrough

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Gulf of Execution

the gap between a user's goal and
the means to execute that goal





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the gap between a user's goal and the means to execute that goal



the gap between the system output and a user's expectations

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How easily can a user...

Form an intention to act.

... know they need to do something?



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Figure out and carry out actions.

... notice the correct action is available, and associate it with what they're trying to do?



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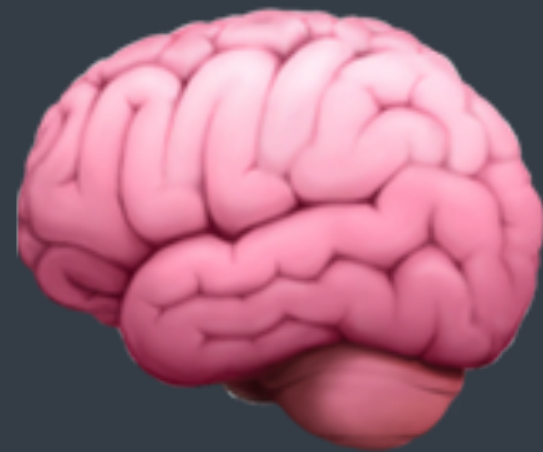
Perceive and interpret what happened.

... based on what occurs after the action is taken, know that it was the right thing to have done?

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Gulf of Evaluation

Evaluate progress towards their goal.

... understand how they've made progress towards their larger goal?

Perceive and interpret what happened.

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Cognitive Walkthrough

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Process.

1. Brainstorm a set of tasks a user might wish to perform with your interface.
2. For each task, break it down into the specific sequence of actions a user needs to perform (and expected system responses) .
3. For each action, answer the 4 questions.
4. If you locate a problem, **pretend it has been fixed** and proceed to the next action.

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Tasks.

1. Withdraw \$40 from my checking account.
2. Deposit a check into my checking account.
3. Check the balance of my savings account.

Cognitive Walkthrough



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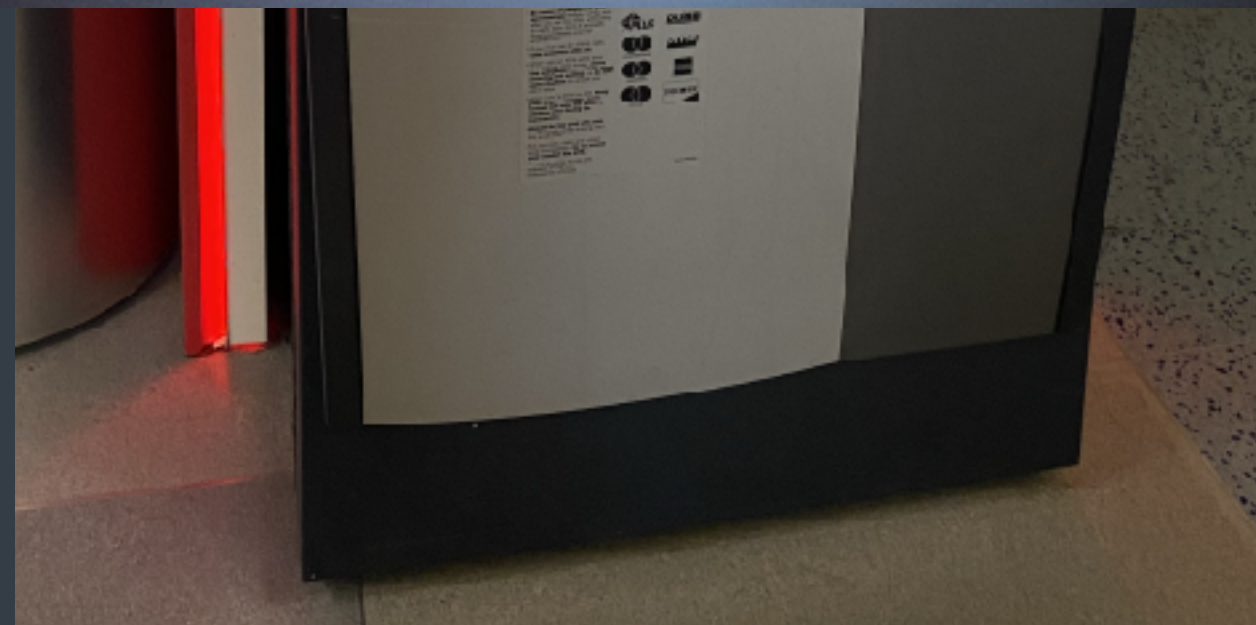
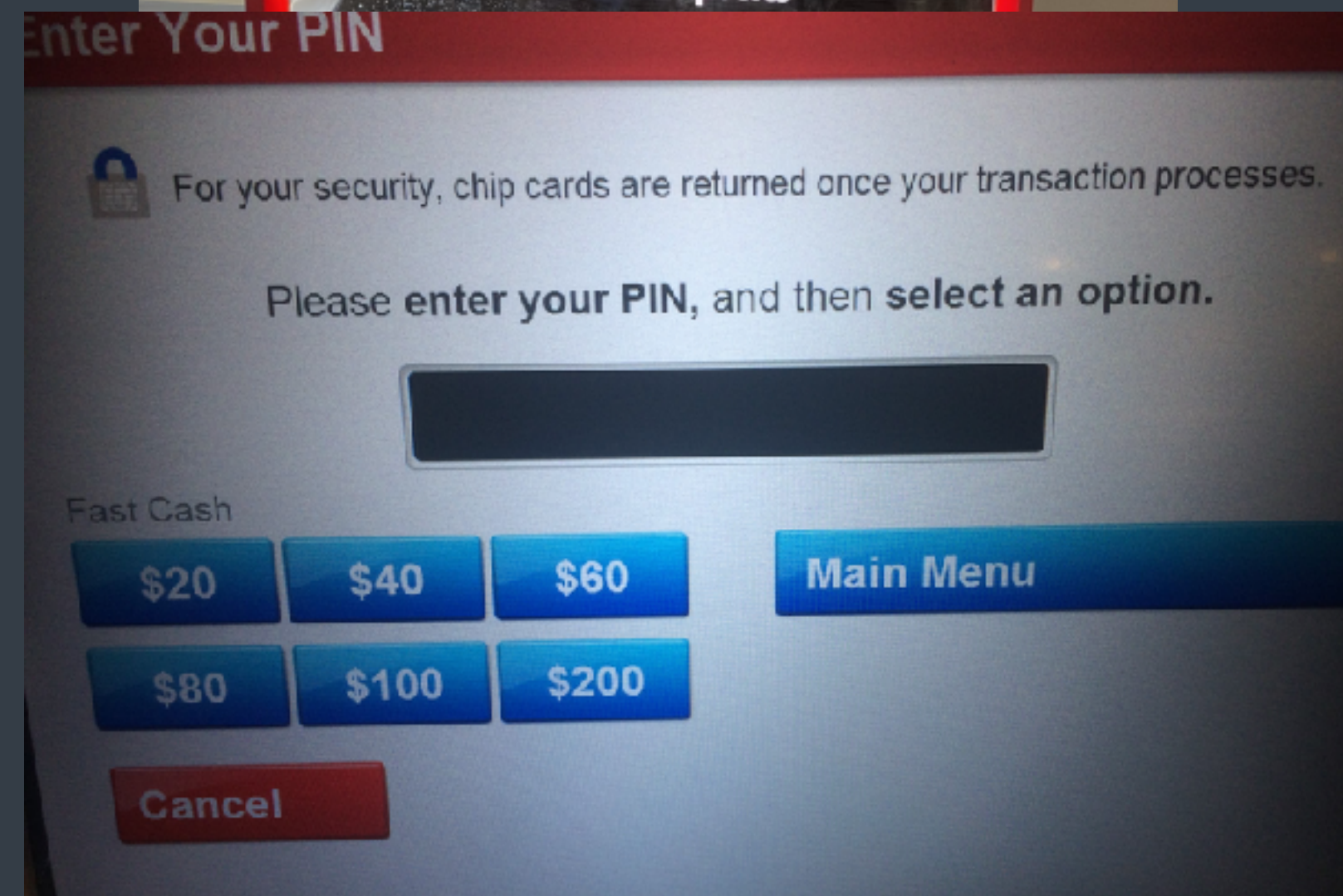
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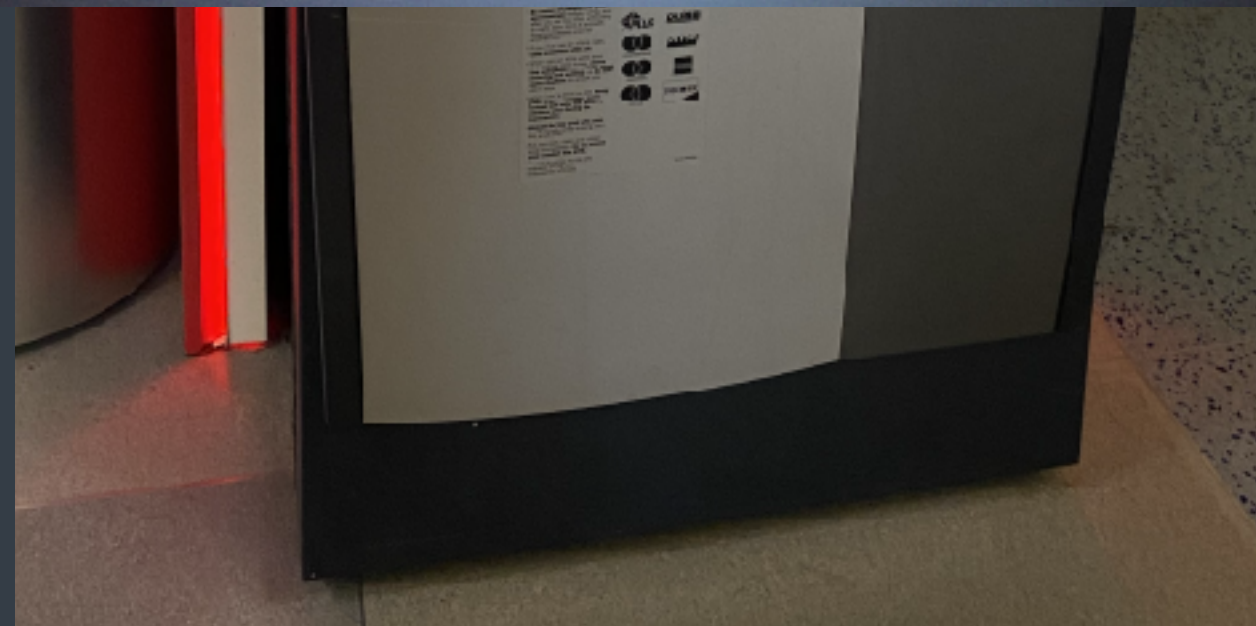
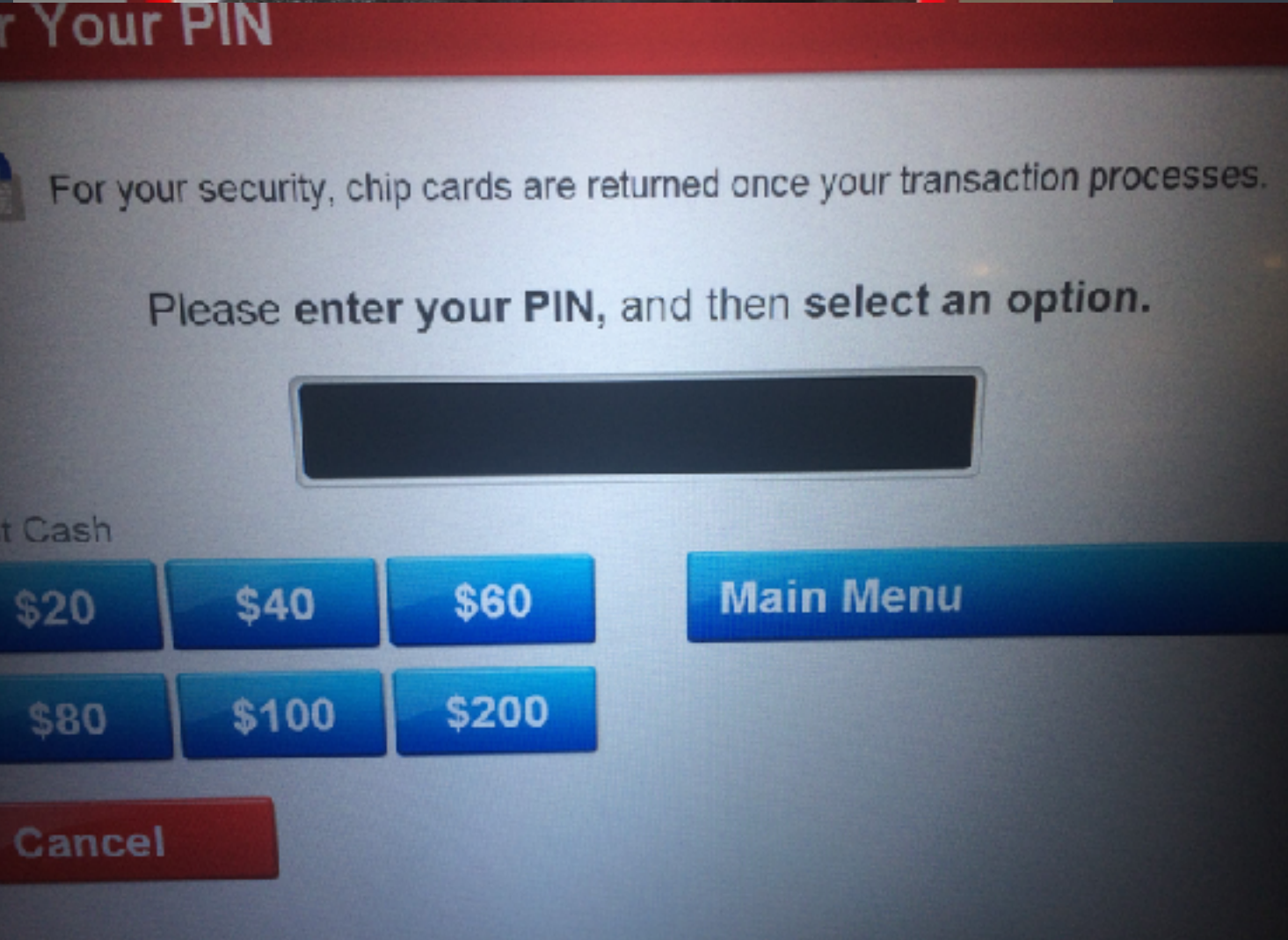
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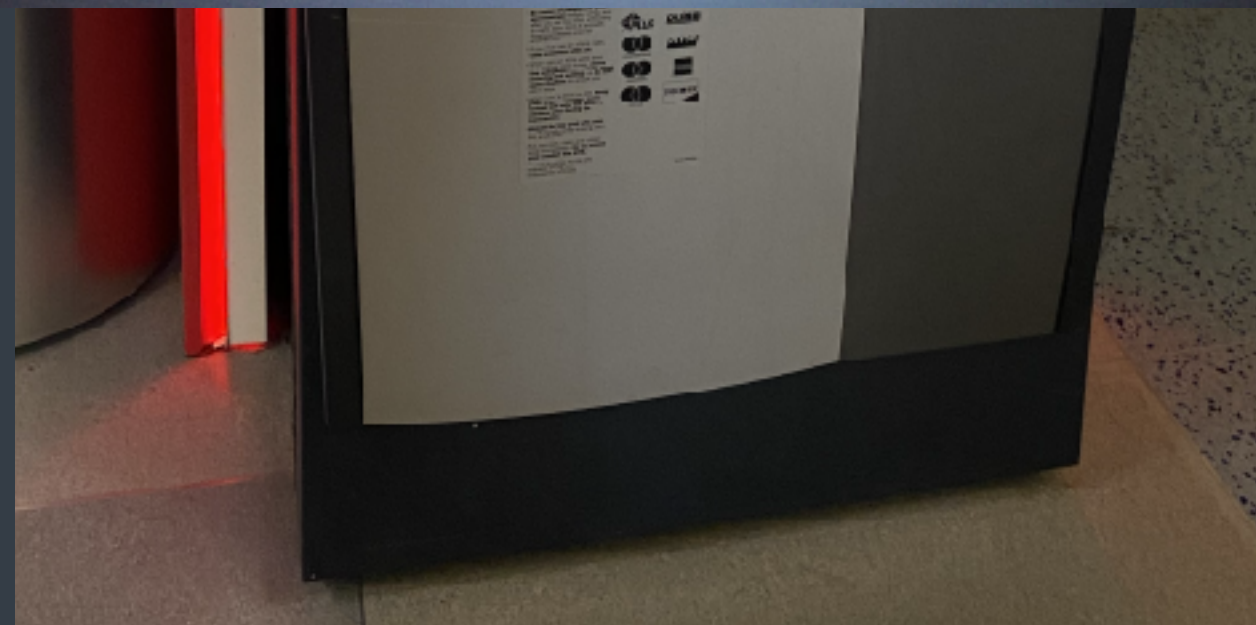
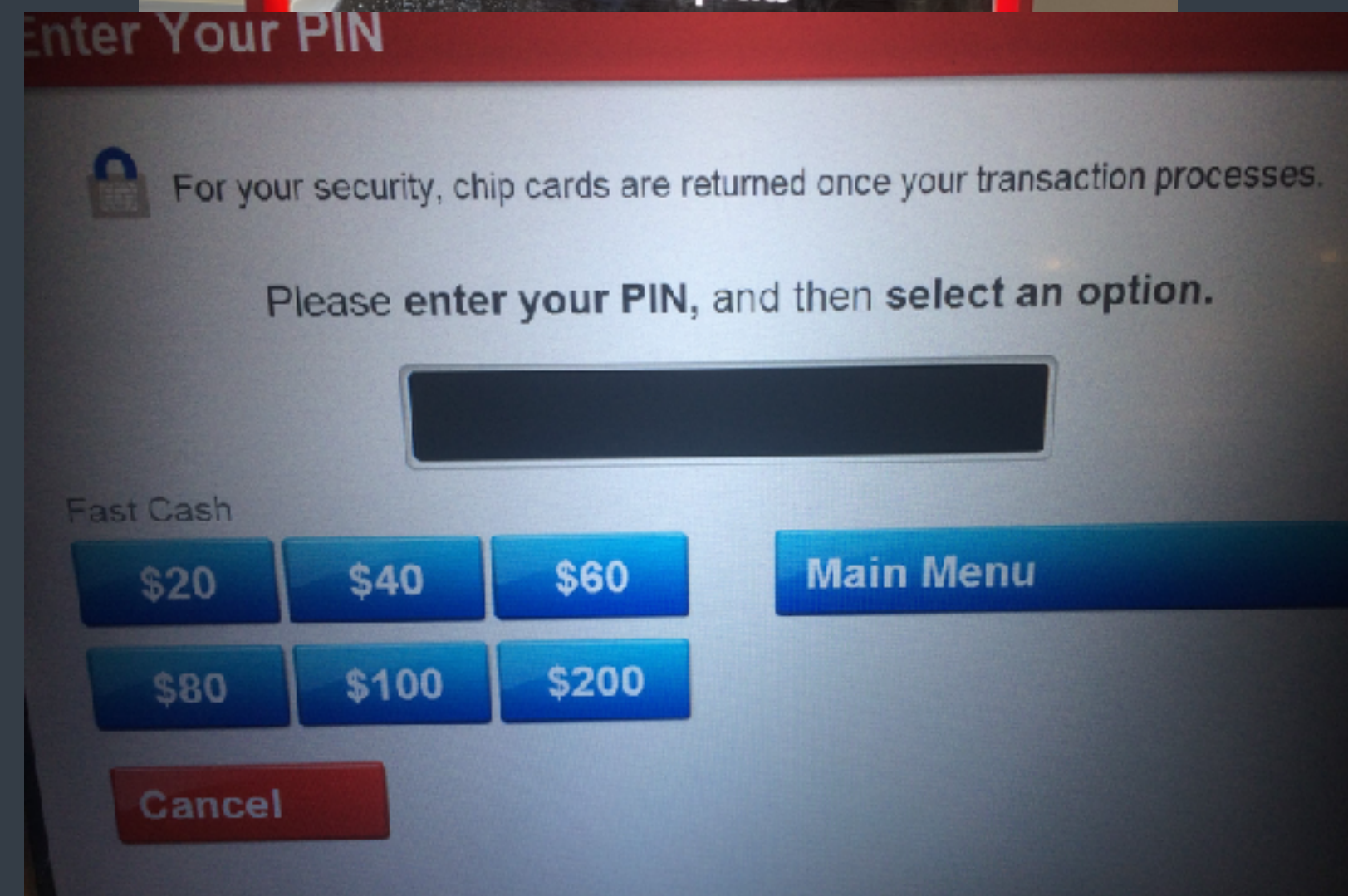
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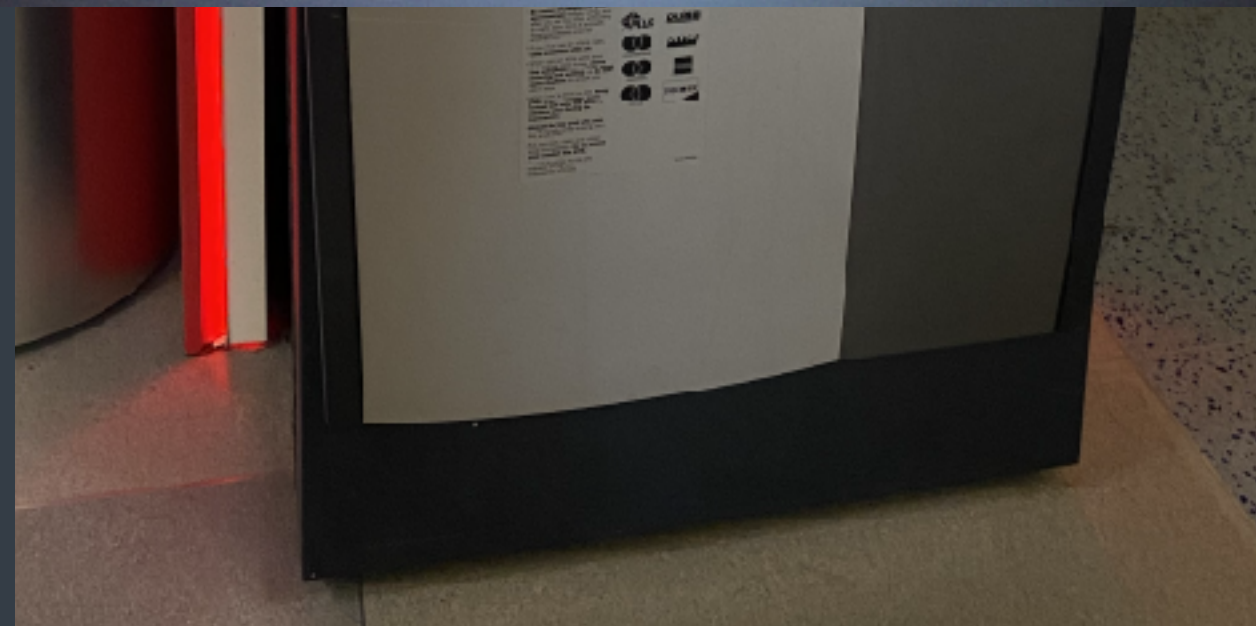
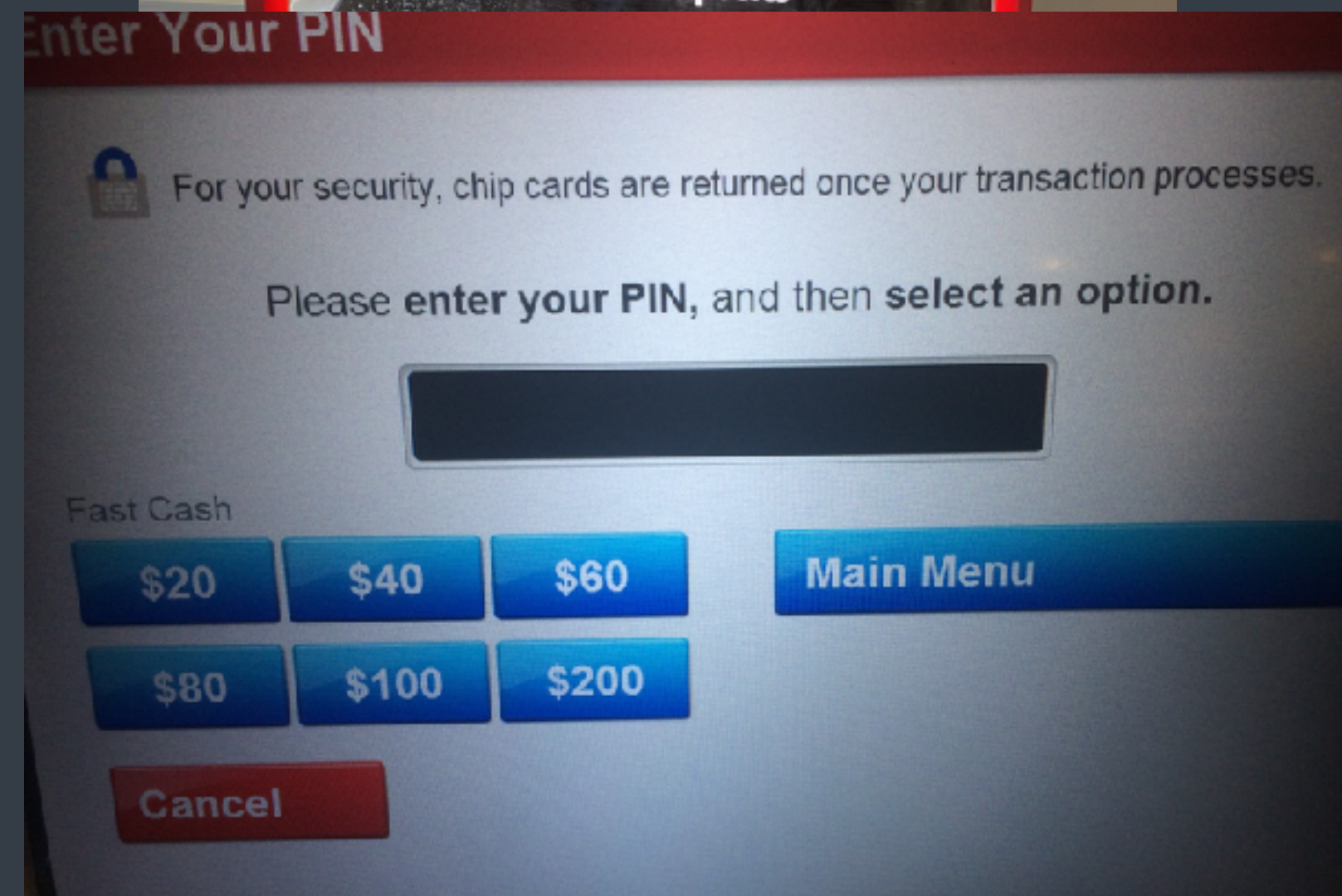
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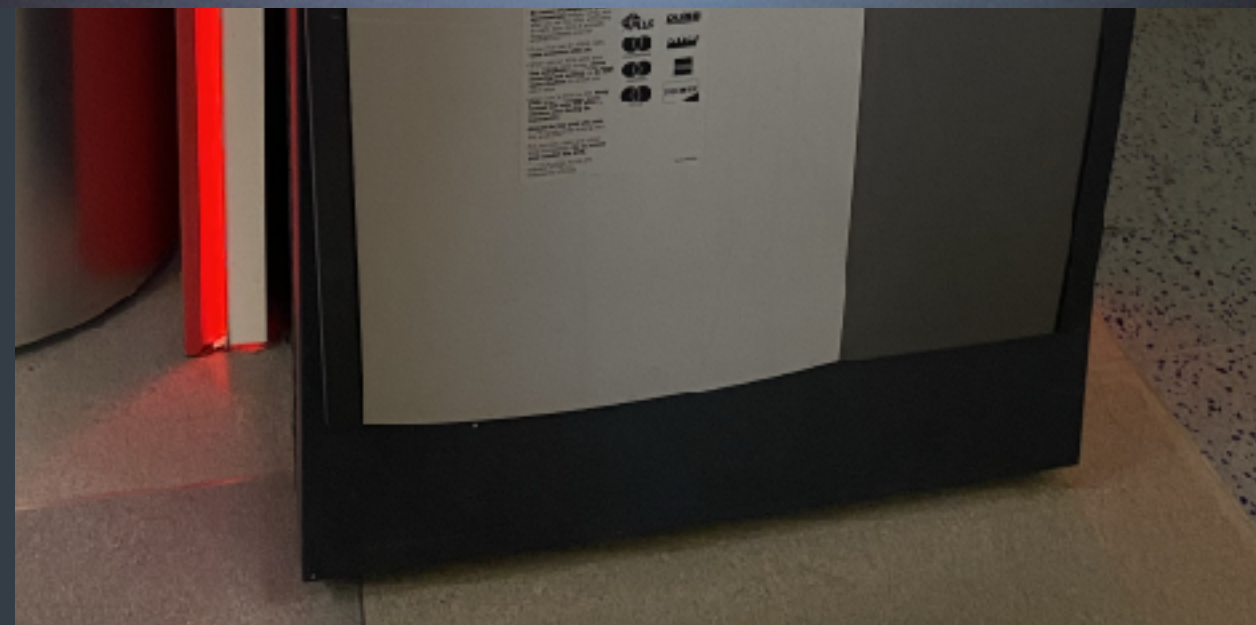
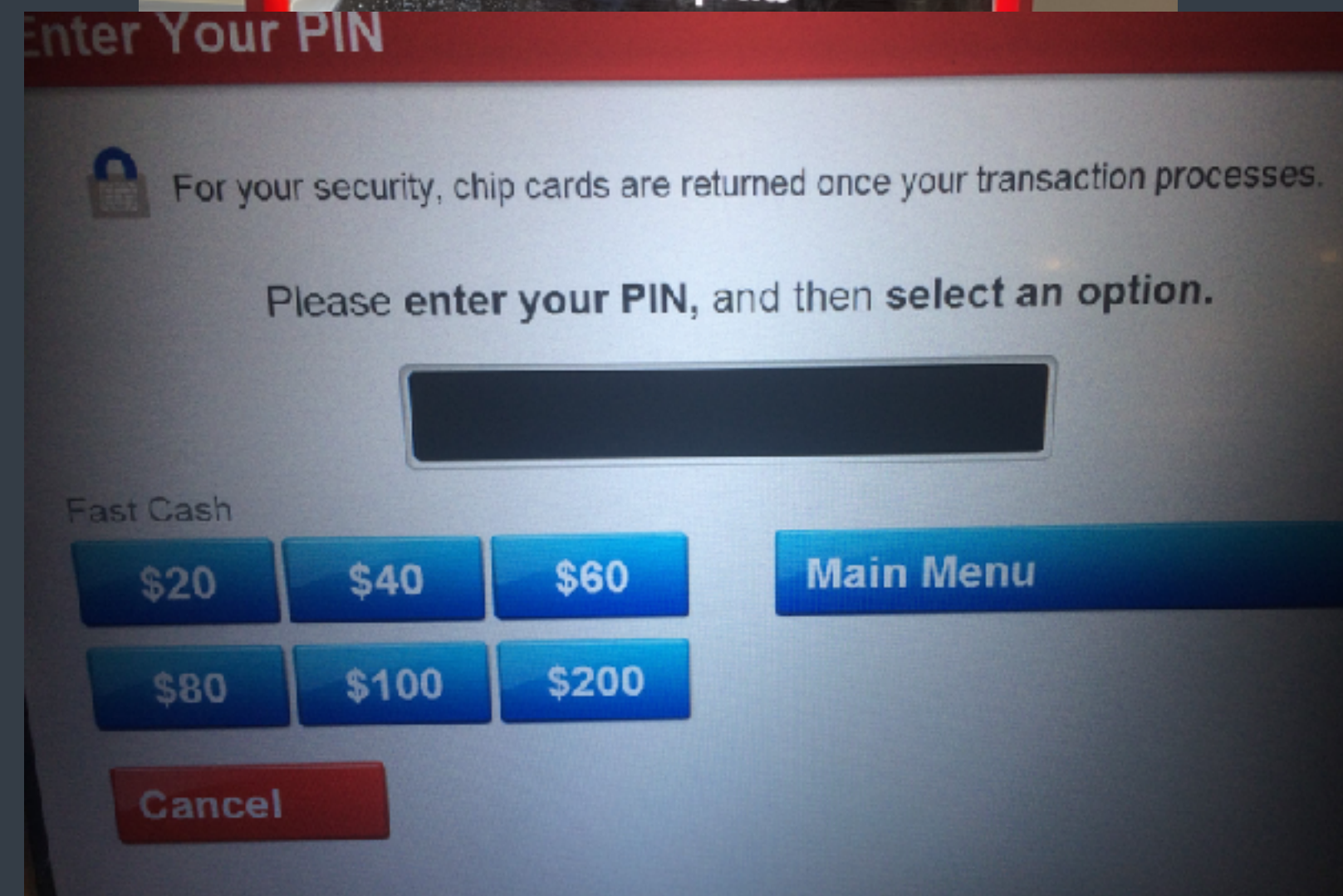
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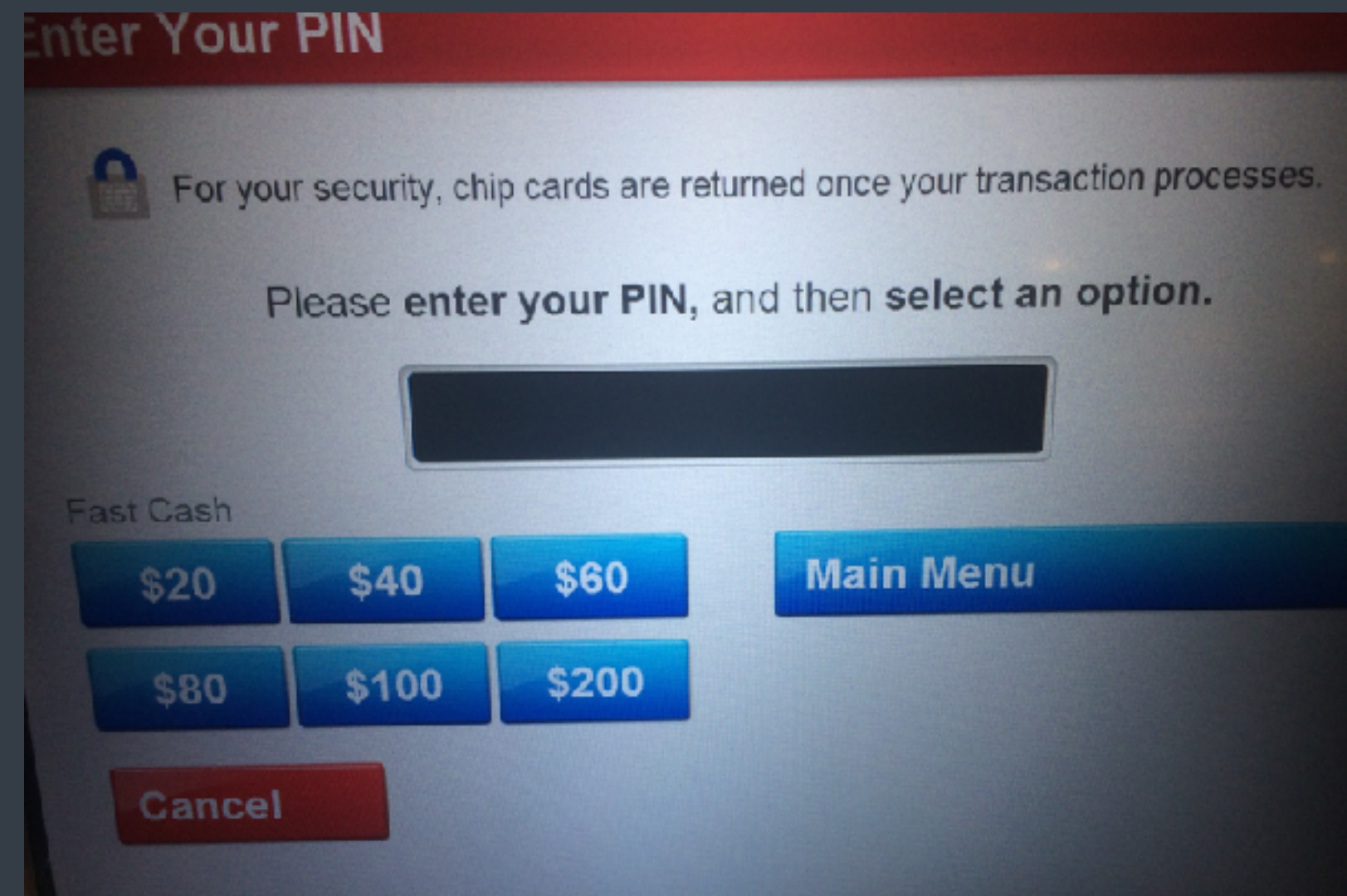
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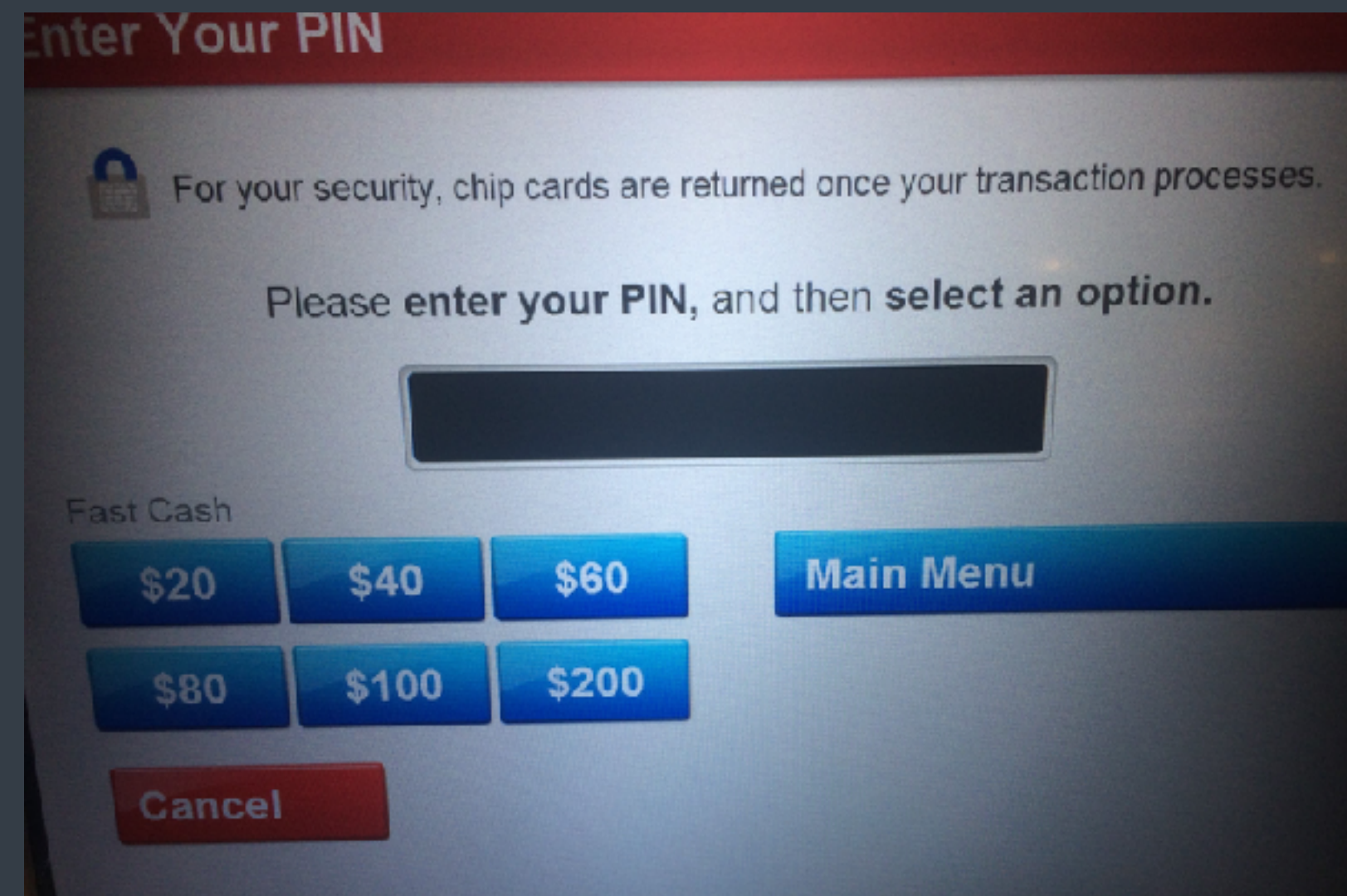
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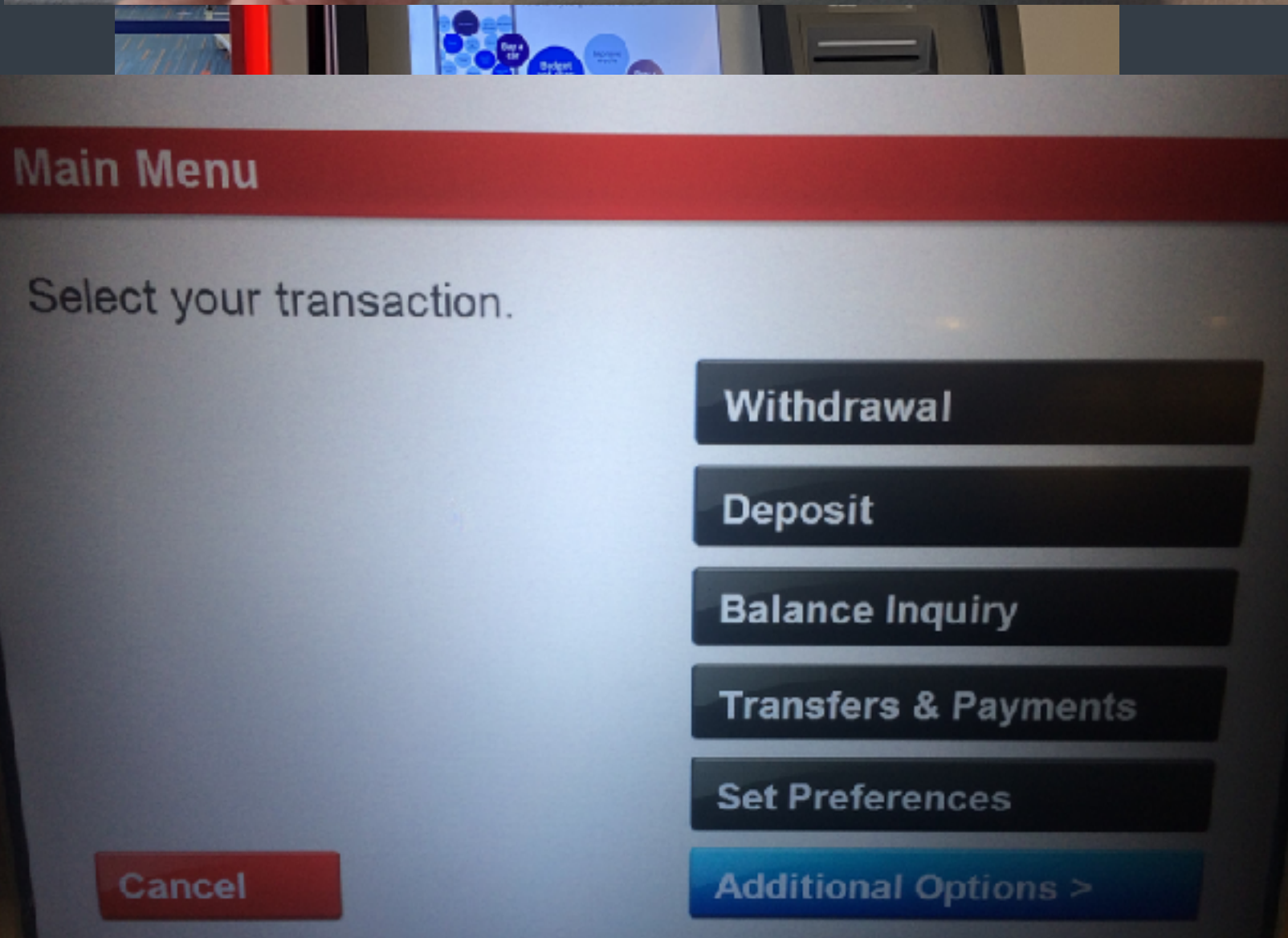
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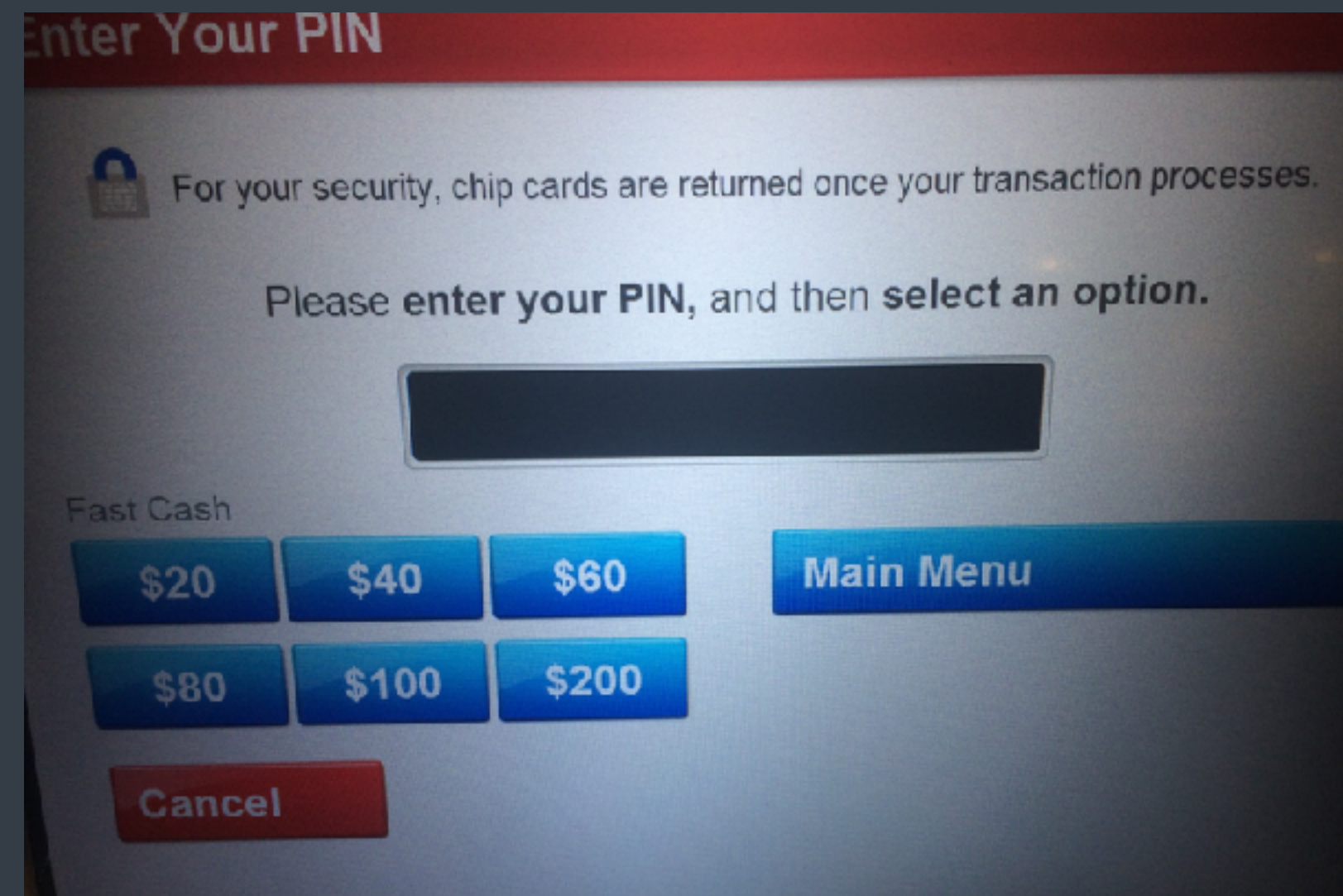
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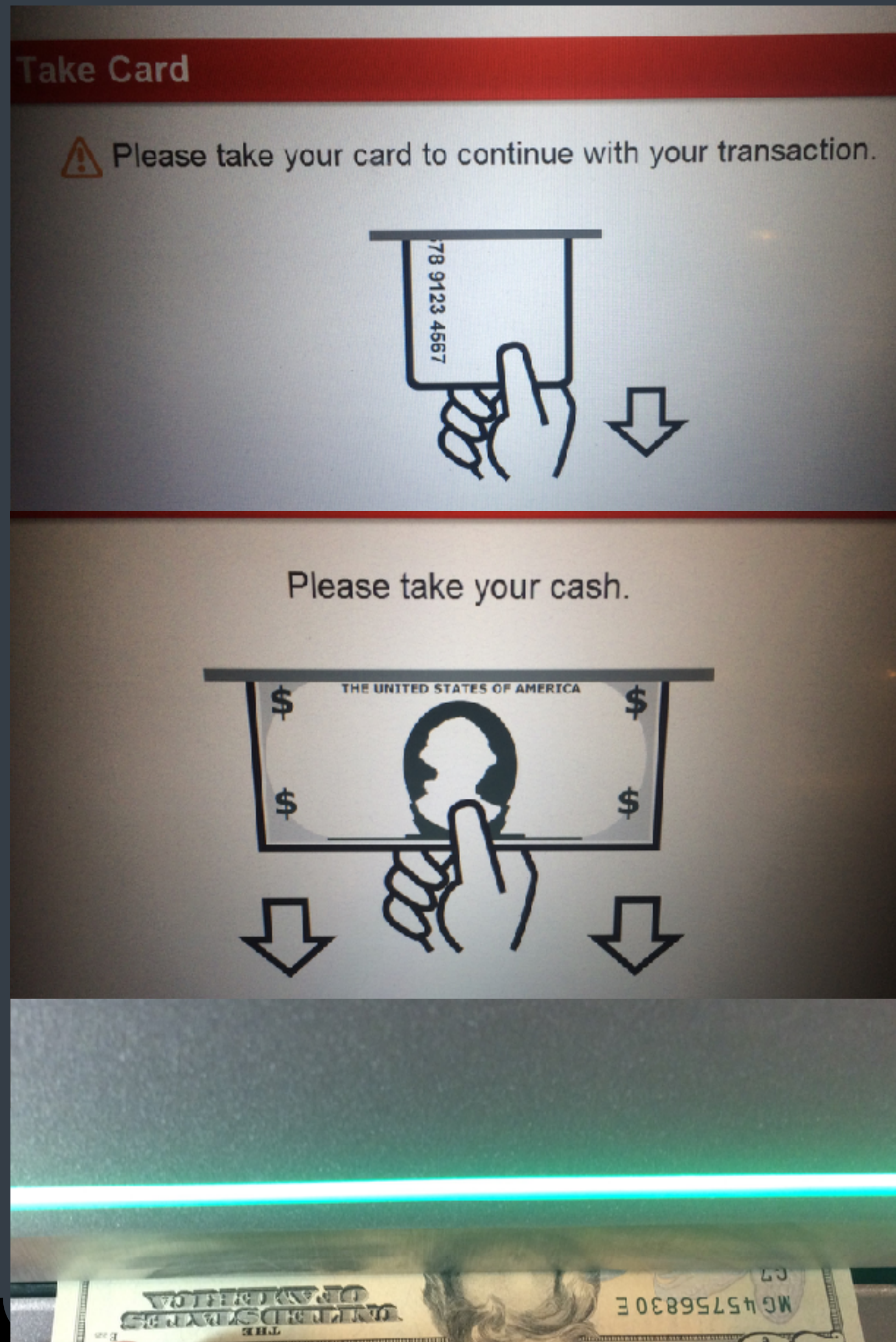
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- (1) Yes.
- (2) Yes.
- (3) Yes. But message could be friendlier/clearer.
- (4) Yes.

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Survey

Heuristic Evaluation & Cognitive Walkthrough

design fidelity (realism) / stage of the design process

Surveys

Measuring user preferences.

- ✓ Relatively cheap to construct (e.g., can be purely textual, or can show screenshots/mockups).
- ✓ Collect + analyze large number of responses relatively quickly.
- ✓ Don't necessarily need to compensate participants.
- ✗ Often gap between what participants *say* they're going to do vs. what they *actually* do.

Bank of America® Advisory Panel

12%

How often do you use Bank of America's website for online banking?
(Select one)

- More than once per week
- Once a week
- Every other week
- Once a month
- Every other month
- A few times a year
- I don't use online banking

Twitter Surveys @TwitterSurveys

We've selected a group of users for a brief survey. Please answer a few quick questions! analytics.twitter.com/research/

How often do you tweet with on Twitter?

- Always
- Often
- Sometimes
- Rarely
- Never

1 of 5 questions

What type of media do you tweet with on Twitter?

- GIFs
- Photos
- Videos
- Vines
- Other / None of the above

3 of 5 questions

Why do you use emojis? [select all that apply]

- To express my feelings
- To tell something that words wouldn't easily express
- To show what I'm doing at a given point in time
- They are easier to type than words
- Other / None of the above

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✗ Designing surveys can be difficult.

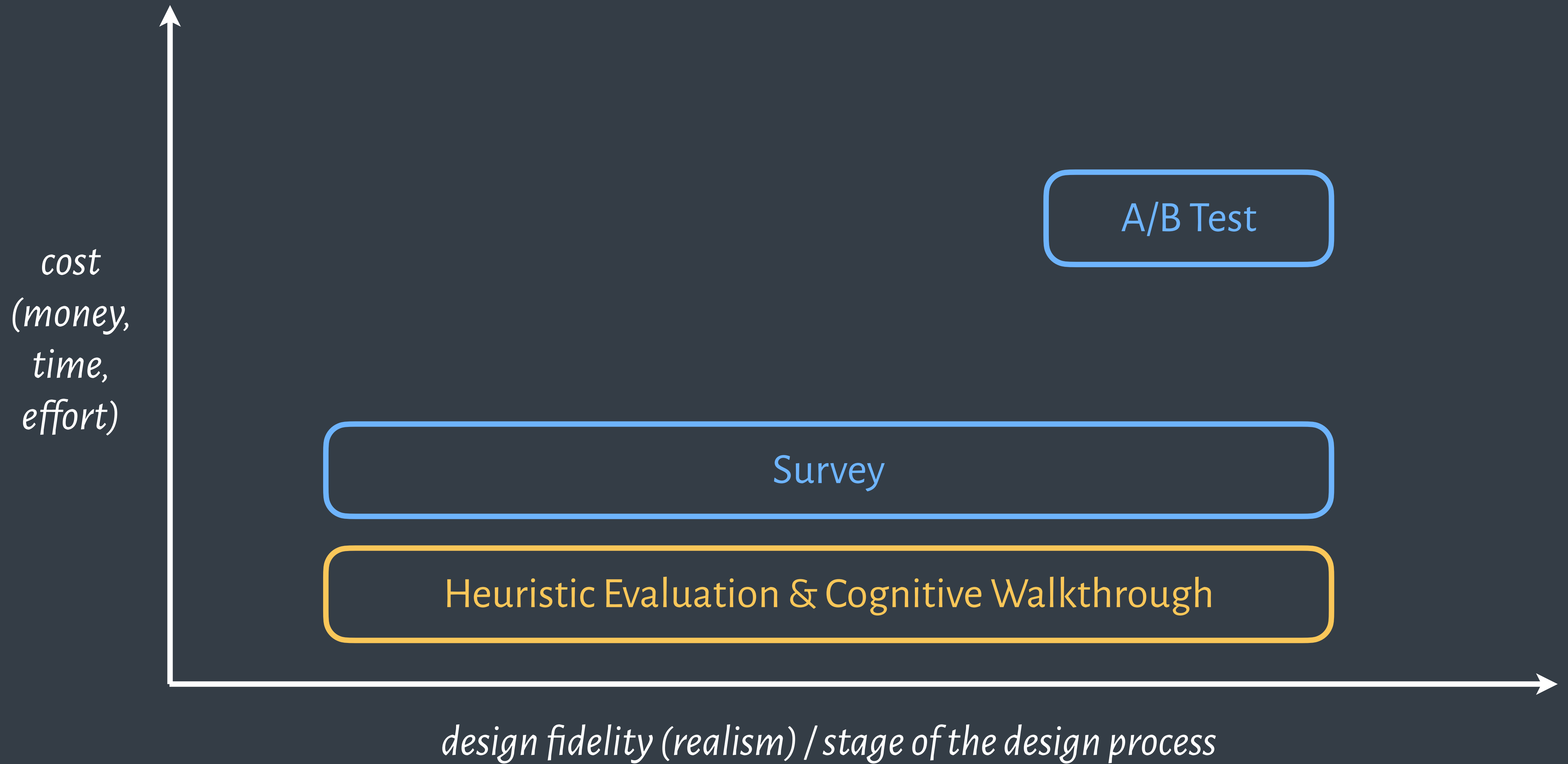
The image shows a survey interface on the left and a tweet on the right. The survey interface has a blue header with the word "Survey" and a back arrow. Below the header, there are two tabs: "There are a wide range of topics and behaviors that appear on Facebook in an ideal world where you could set policies, how would you respond to a private message in a year old girl for sex" and "When thinking about the rules for deciding". Below the tabs, there are four radio button options: "This content should be removed from Facebook, and I would not want to see it", "This content should be removed from Facebook, but I don't mind seeing it", "This content should be removed from Facebook, and no one else should see it", and "I have no preference". The tweet on the right is from Jonathan Haynes (@JonathanHaynes) dated Mar 4. The text of the tweet says: "I mean, this is not the kind of topic you should be determining policy on by surveying your readers. Facebook so out of touch with the real world." It has 18 replies, 51 retweets, and 322 likes. Below the tweet is a reply from Guy Rosen (@guyro) that says: "We run surveys to understand how the community thinks about how we set policies. But this kind of activity is and will always be completely unacceptable on FB. We regularly work with authorities if identified. It shouldn't have been part of this survey. That was a mistake." The tweet also shows a "Follow" button and a timestamp of 11:36 AM - 4 Mar 2018. At the bottom of the tweet, it shows "4 Retweets 12 Likes" and a row of profile pictures of users who interacted with the tweet.

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A/B Testing

Compare two alternatives.

50% of users see option (A), 50% of users see option (B).

Determine measures of success — e.g., sign ups, click through rates, engagement, etc.

A

The screenshot shows the Highrise pricing page for version A. The main heading is "Start a Highrise Account" with a sub-heading "Pay as you go. 30-day free trial on all accounts. No hidden fees." Below this are three pricing plans: Premium (\$99/month for power users), Plus (\$49/month, most popular plan), and Basic (\$24/month for small groups). The Plus plan is highlighted with a blue border. A red box highlights the "30-day Free Trial on All Accounts" banner at the top. A red callout box with an upward arrow and "30% more signups!" is overlaid on the Plus plan. The footer contains the text "Everything in your Highrise account is safe, secure, and password-protected."

“Highrise does nearly everything a personal secretary might do except go out for coffee and pick up our dry cleaning.”

washingtonpost.com

B

The screenshot shows the Highrise pricing page for version B. The main heading is "30-day Free Trial on All Accounts" with a sub-heading "Pick a plan & sign up in 60 seconds. Upgrade, downgrade, cancel at any time." Below this are three pricing plans: Premium (\$99/month for power users), Plus (\$49/month, most popular plan), and Basic (\$24/month for small groups). The Plus plan is highlighted with a blue border. A red box highlights the "30-day Free Trial on All Accounts" banner at the top. A red callout box with an upward arrow and "30% more signups!" is overlaid on the Plus plan. The footer contains the text "Everything in your Highrise account is safe, secure, and password-protected."

“Highrise does nearly everything a personal secretary might do except go out for coffee and pick up our dry cleaning.”

washingtonpost.com

A/B Testing

Compare two alternatives.

50% of users see option (A), 50% of users see option (B).

Determine measures of success — e.g., sign ups, click through rates, engagement, etc.



JOCELYN



MICHAEL

4.78% ↑



WILL

3.49% ↑



JOHN

3.38% ↓



MARI

0.8% ↓



BRIAN

2.2% ↑

A/B Testing

The original design features a clean, professional layout. At the top, a navigation bar includes links for Home, Tour, My Highrise?, Contact & Advertisers, Phone, Help/Support, Plans & Pricing, and Sign In. The main headline reads "Know Your Contacts & Leads by Heart" with a sub-headline stating "Over 100,000 businesses use Highrise to manage 20 million contacts & customer relationships." Below this, a central graphic shows the Highrise logo surrounded by four questions: "Who followed up on that new client sales lead?", "What's the lawyer's mobile number? When did we last speak with her?", "Where are the notes from Monday's conference call?", and "See Plans and Pricing". A "See Plans and Pricing" button is prominently displayed. The text "Highrise remembers so you never forget." is followed by a list of features: "Store every conversation, email, call, meeting, document, and deal you've ever had with a contact. With Highrise you'll always know who you talked to, what was said, and when to follow-up next." Below this, there are four video testimonials from various industries: Medical (Hospitality & Law), Workforce (Transaction Services), Agile Partners (Software Development), and Colonial Spirit (Manufacturing Design Firm). A section titled "Highrise's focus on simplicity, clarity, and ease of use make it truly unique. You'll love using Highrise." is followed by two screenshots of the Highrise interface, one showing a contact profile for Jordan Chung and another showing a contact log for Stephanie Lake. The overall design is clear, concise, and easy to navigate.

ORIGINAL DESIGN

The long form design features a more detailed and structured layout. At the top, the Highrise logo is followed by a tagline: "Highrise is an easy-to-use app for small businesses that keeps track of your contacts, emails, leads, deals, and deals." The main headline reads "How to keep the upper hand in your business relationships." Below this, a sub-headline states "The one who remembers always has an edge. Whether you're resolving a dispute or reaching out to clients, it pays to be prepared." A red arrow points to a section titled "Here's how to get that edge by using Highrise:" followed by a list of bullet points: "Impress with preparation. Highrise keeps a log of notes so you can recall details from past conversations. Have the whole back story when you walk into a meeting. Highrise is like an always available cheat-sheet.", "Track promises from vendors, partners and clients before a problem ever occurs. When disputes happen, you'll be ahead of the game with a dated record of the whole issue.", "Never forget to follow-up. Instead of going to your agenda, let Highrise tell you to follow up. Highrise will send you a text message or email so you never forget to make the call.", "Always know where to find everything. Stop fumbling with papers and filing cabinets. Highrise lets you attach notes and documents right on a page for the person they are about. You'll have one place to find the info you need.", "Sleep well at night. Life is easier when you have a system remembering things for you. Information goes into Highrise so you can get it out of your mind and off your shoulders.", "Declutter your email inbox. Forward emails to Highrise and they will be automatically filed under the correct contact for easy reference.", "Share with your team. It's embarrassing when your right hand doesn't know what the left is doing. Highrise gives your team one place to see the latest status. Find out who talked to a person last, what they said, and who is...". To the right of the main text, there is a "On this page" section with a list of links: "How to get an idea with Highrise", "See more Highrise content on YouTube", "Who small businesses love it", "A team, from Contacts, Leads and Deals", and "Everything you need to get the upper hand in your business relationships". Below the main text, there is a screenshot of the Highrise interface showing a contact profile and a list of activities. The overall design is more detailed and structured, providing more information and a clear path for the user.

LONG FORM DESIGN

37.5% ↑

A/B Testing

Compare two alternatives.

50% of users see option (A), 50% of users see option (B).

Determine measures of success — e.g., sign ups, click through rates, engagement, etc.

- ✓ Can be cheap to run if changes are relatively targeted.
- ✗ Encourages hill-climbing — marginal improvements that mask opportunities for bigger changes.

The New York Times

Putting a Bolder Face on Google

Give this article



By **Laura M. Holson**

Feb. 28, 2009



A defender
Marissa M
look and fe
engine.
Noah Berge

A designer, Jamie Divine, had picked out a blue that everyone on his team liked. But a product manager tested a different color with users and found they were more likely to click on the toolbar if it was painted a greener shade.

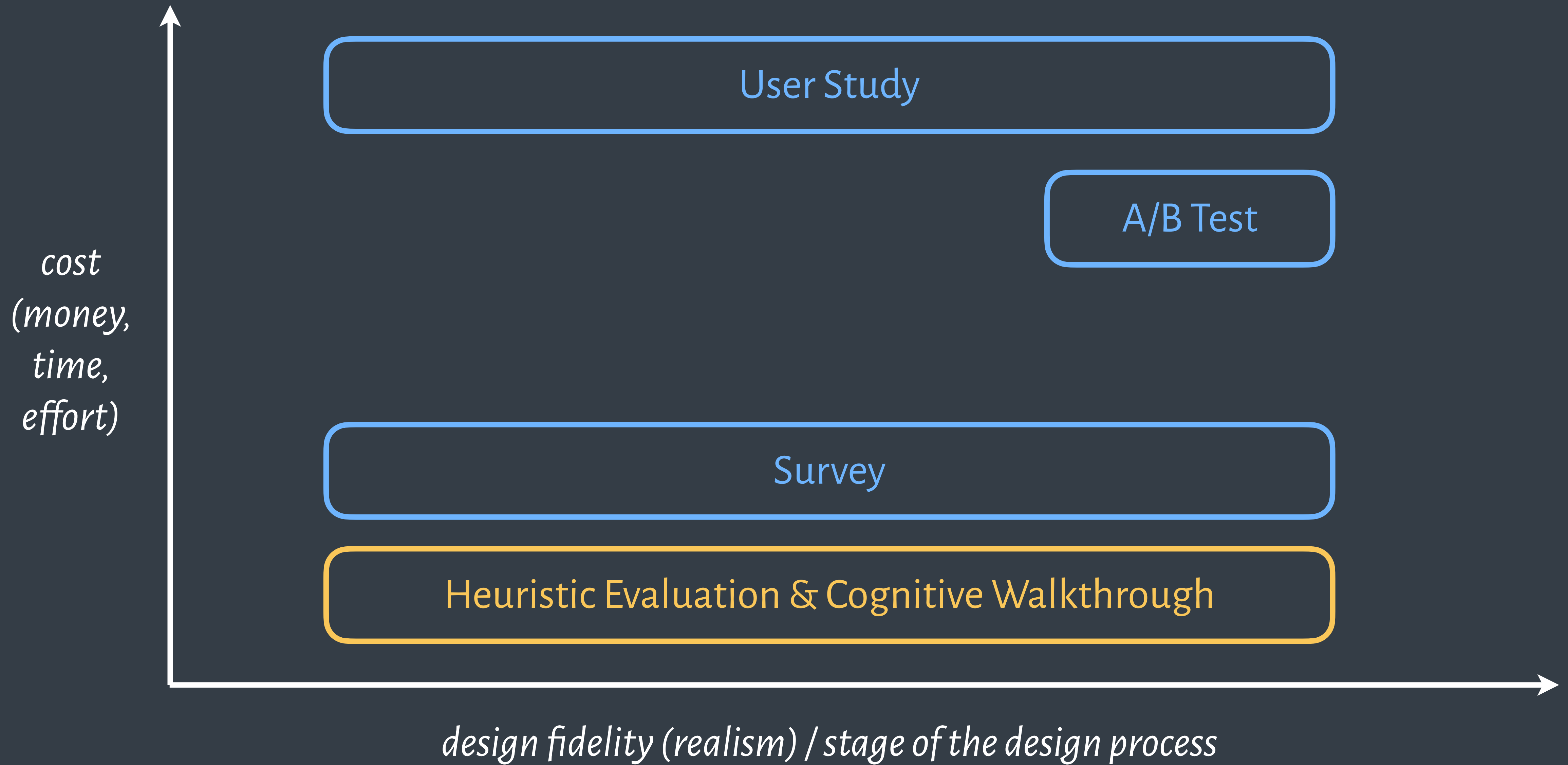
As trivial as color choices might seem, clicks are a key part of Google's revenue stream, and anything that enhances clicks means more money. Mr. Divine's team resisted the greener hue, so Ms. Mayer split the difference by choosing a shade halfway between those of the two camps.

Her decision was diplomatic, but it also amounted to relying on her gut rather than research. Since then, she said, she has asked her team to test the 41 gradations between the competing blues to see which ones consumers might prefer.

Yes, it's true that a team at Google couldn't decide between two blues, so they're **testing 41 shades between each blue** to see which one performs better. I had a recent debate over whether a border should be 3, 4 or 5 pixels wide, and was asked to prove my case. I can't operate in an environment like that. I've grown tired of debating such minuscule design decisions. There are more exciting design problems in this world to tackle.

— Doug Bowman
(Google's first visual
designer), March 2009.





User Study

Gold standard. Bring participants into your lab/office.

Have them use your design — set them specific tasks, or leave it open-ended.

Can use any/all prior methods — e.g., surveying, interviewing, comparing alternatives—and **at any level of design fidelity**.



User Study

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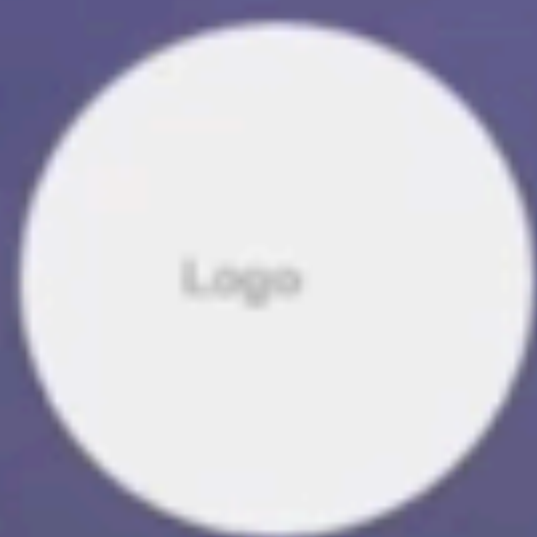
Observe your participant's **process**.

Ask them to talk out loud while performing tasks (**think aloud**).

Thinking out loud feels very strange to participants, so they will often fall silent. **Prompt them** to keep talking.

- tell us what you are *thinking*
- tell us what you are *trying to do*
- tell us what *questions* come up as you perform the task
- tell us the things you *read* on screen

Try not to help them. Pre-decide on where you might intervene. Only help if they are completely unable to make progress.



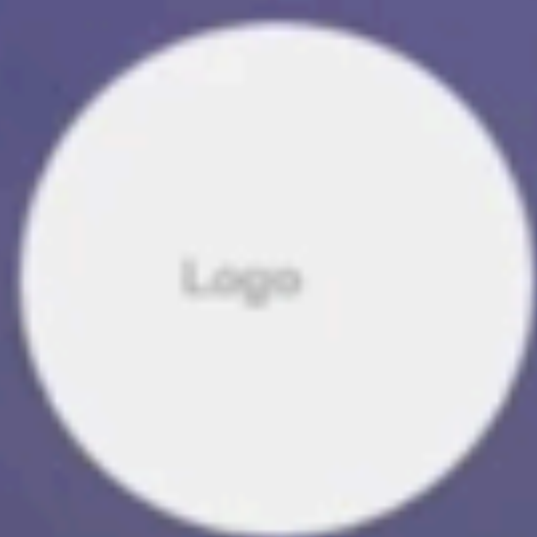
Logo

CHOOSE YOUR ADVENTURE

Get Gear >

List Your Gear >





Logo

CHOOSE YOUR ADVENTURE

Get Gear >

List Your Gear >



Français	Contact Us	Help	Search	Canada Site
Home	Site Map	Forms	What's New	



HUMAN RESOURCES MANAGEMENT

Home Compensation/Benefits Laws and Regulations



- FAQS
- Search by Community
- Search by Industry

HR MANAGEMENT INFORMATION

- Hiring
- Compensation/Benefits
 - Employer Sponsored Benefit Plans
 - Government Sponsored Benefit Plans
 - Payroll Information
 - Laws and Regulations**
- Labour Law at a Glance
- Layoffs and Terminations
- Training & Development
- Employee & Labour Relations
- Health & Safety
- Organizations and Associations
- HR Planning

Compensation/Benefits: Laws & Regulations

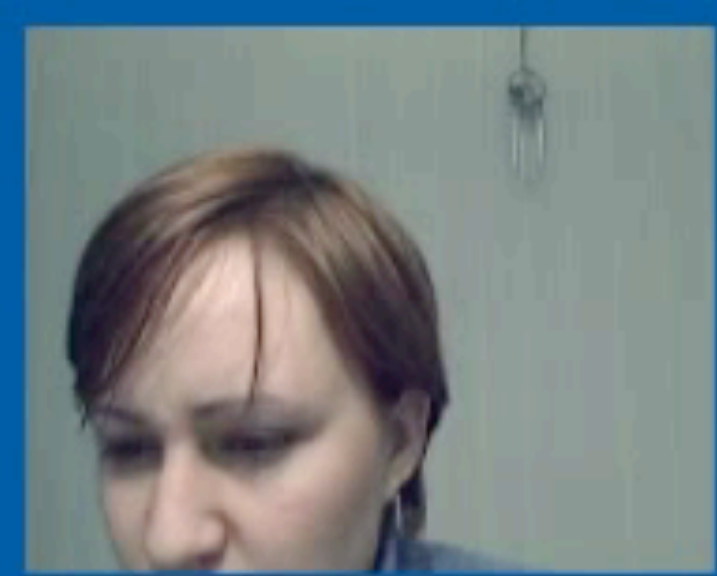
Information concerning payroll administration, including payroll guides and deduction tables, is provided by Canada Revenue and Customs Agencies for **all** businesses. Most employers establishing private benefit plans are covered by provincial regulations. **Select the regulation type below and "Next"** to find the appropriate legislation. If you are not sure which regulations apply, review the list of business activities under "Federally Regulated" to ensure you are not covered by these laws and regulations.

Provincially regulated -- Select a Province --

- All other business not listed below

Federally regulated

- Interprovincial and international services such as: railways; highway transport; telephone, telegraph, and cable systems; pipelines; canals; ferries, tunnels, and bridges; shipping and shipping services;
- Radio and television broadcasting, including cablevision;
- Air transport, aircraft operations, and aerodromes;
- Banks;
- Protection and preservation of fisheries as a natural resource;
- Grain elevators; flour and seed mills, feed warehouses and grain-seed cleaning plants; uranium mining and processing.



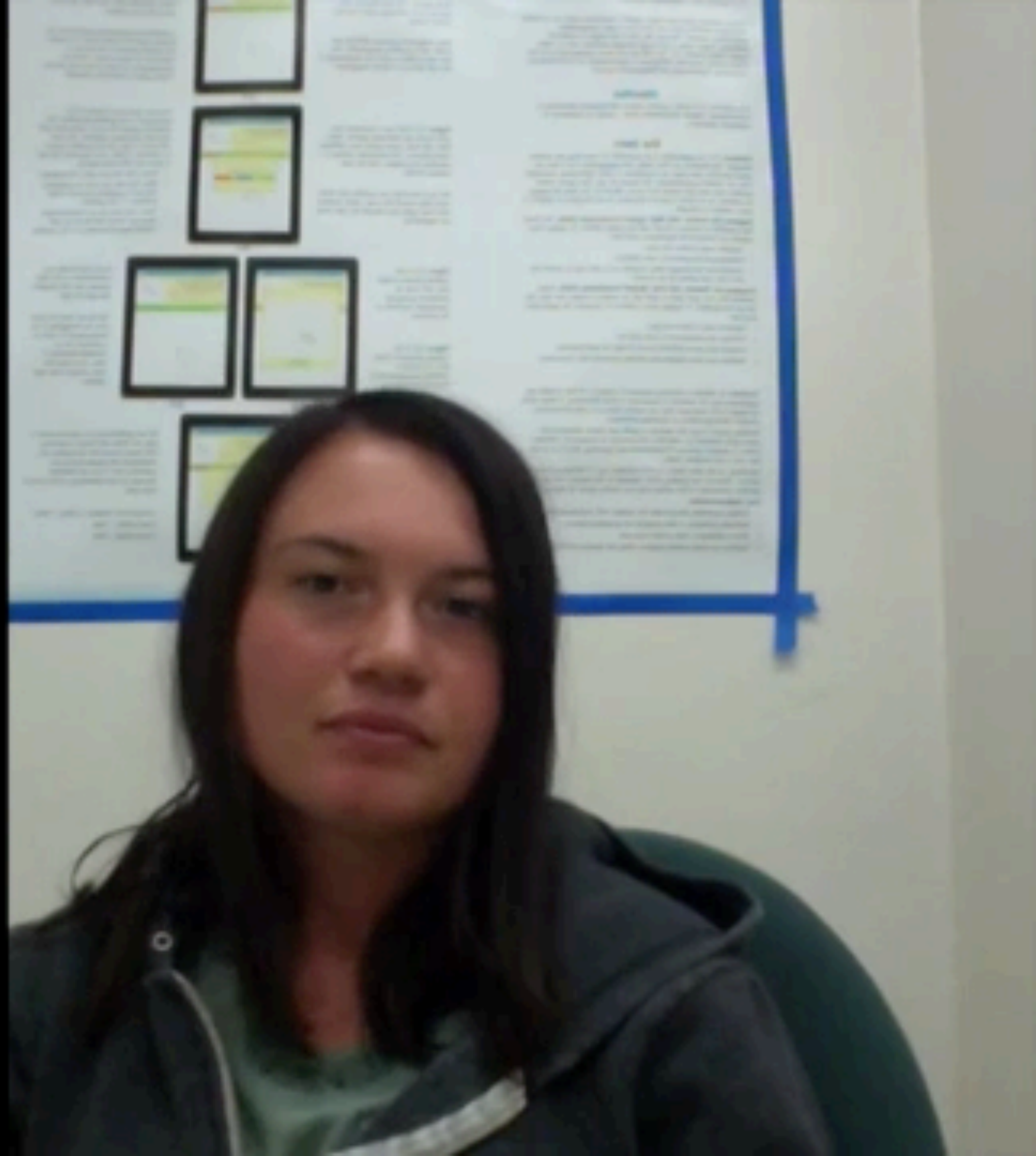


REQUEST SENT!



Expect to hear back from
the owner in 24 hours.

[Go Back Home](#)





5 steps to list



Write Title

Give your listing a descriptive headline



Write Description

Describe your listing's characteristics



Set Price

It's time to make money off that thing!



User Study: Ethical Considerations

User studies can be **stressful** and **distressing**.

People can leave in tears if they think mistakes/confusion/etc.
reflect poorly on them.

People might *unintentionally reveal private information.*

Can be *coercive* if there are power imbalances.

User Study: Ethical Considerations

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You have a responsibility to alleviate these issues:

Participation should be **voluntary**. Solicit informed consent, without pressure to participate.

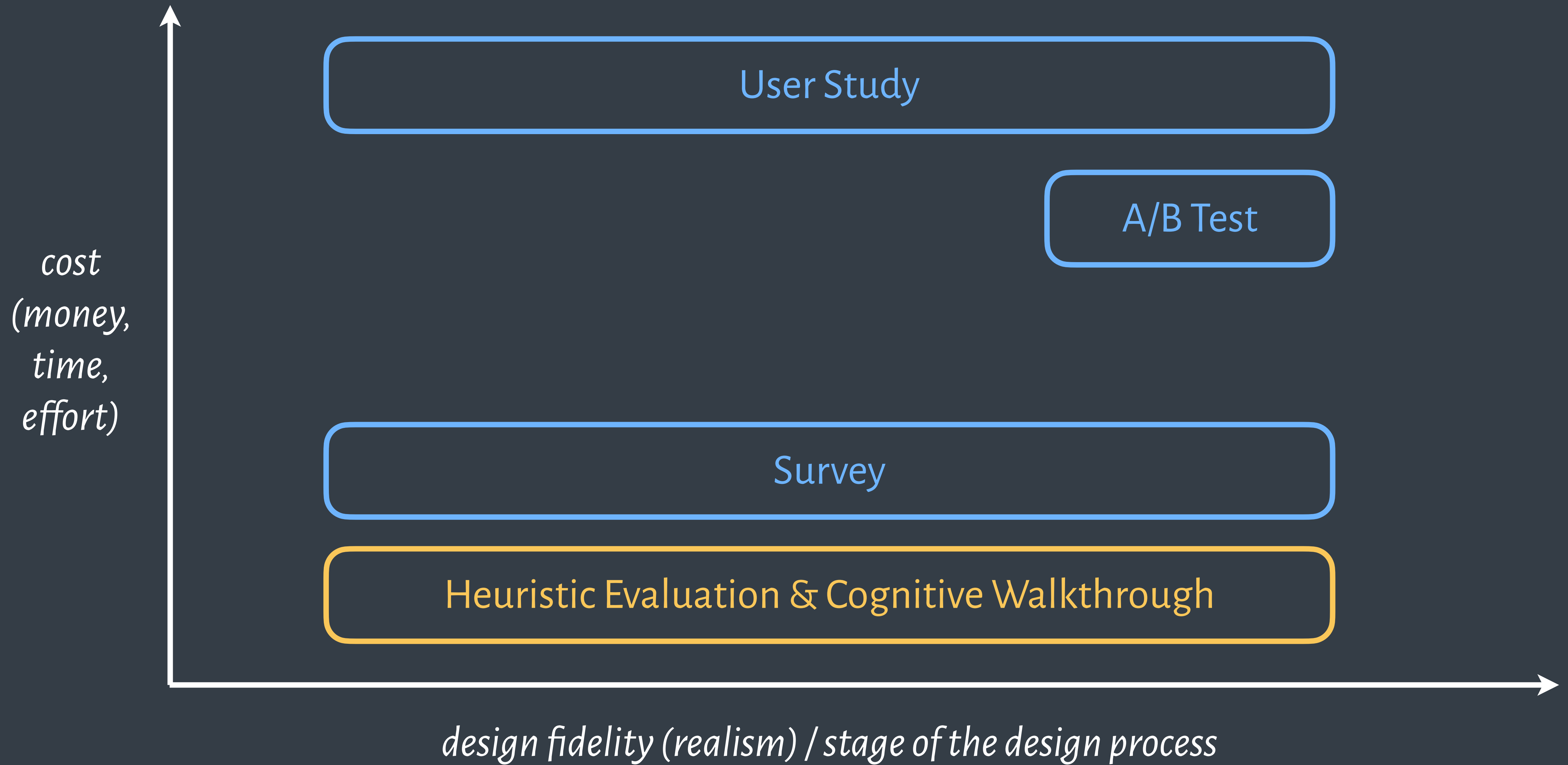
Respect people's time, and compensate them fairly.

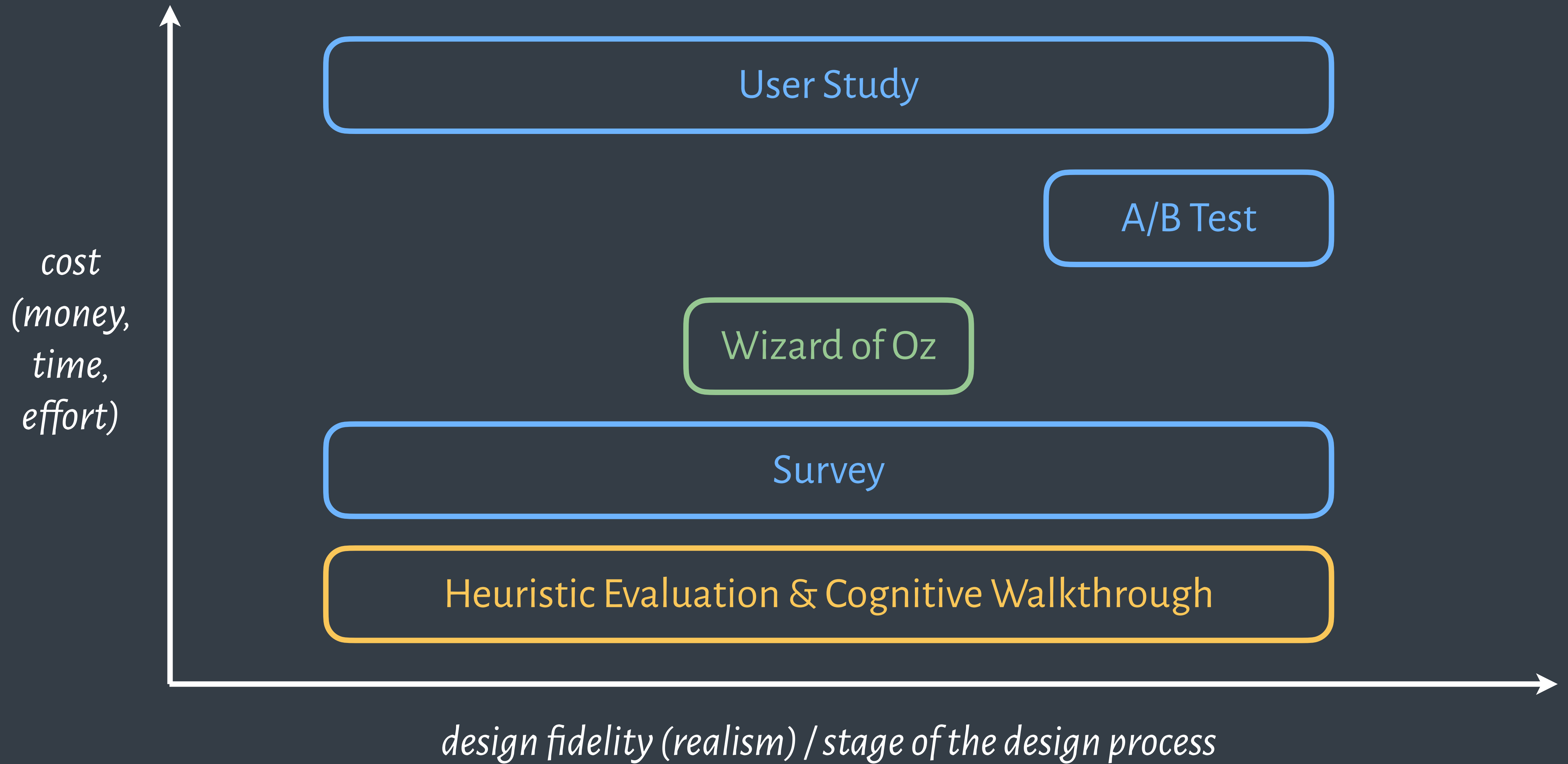
Tell them they can stop at any time.

Emphasize that you are testing the system, not the participant.

Debrief people after the test is over.

Anonymize data as much as possible. Store in a secure location.







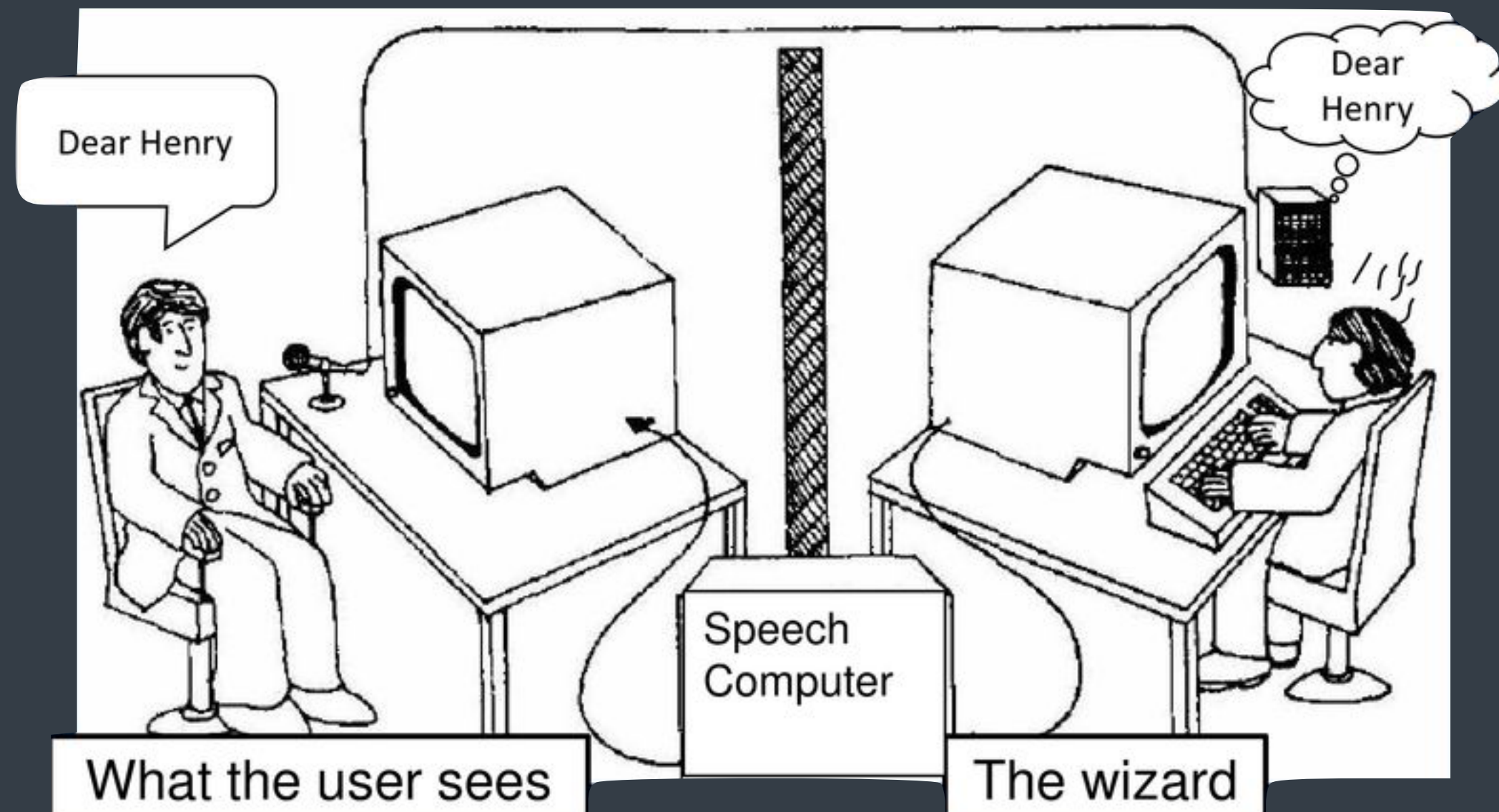
Wizard of Oz Technique

Make an interactive application without (much) code:

Front end interface (hard to fake this part).

(Remote) wizard controls the responses/backend.

Must take less time/money than building the real thing.



Listening typewriter. Gould et al. 1984

Wizard of Oz Technique

Map out scenarios and **application flow**

What should happen in response to user behavior?

Put together **interface “skeletons”**

Develop **“hooks”** for wizard input

Where and how the wizard will provide input (e.g., selecting the next screen, entering text, entering a zone, recognizing speech, etc.)

Must be possible to replace later with computer

Rehearse wizard role with a colleague.



Group 9
Enny, Carmel
Ana



