

HCI and Design

Topics for today

- Quantitative data
 - Instrumentation and logging
 - Quantitative surveys
- AB testing
- Activity

Quantitative vs. Qualitative

- | | |
|---|---|
| 1. Explanation through numbers | 1. Explanation through words |
| 2. Objective | 2. Subjective |
| 3. Deductive reasoning | 3. Inductive reasoning |
| 4. Predefined variables and measurement | 4. Creativity, extraneous variables |
| 5. Data collection before analysis | 5. Data collection and analysis intertwined |
| 6. Cause and effect relationships | 6. Description, meaning |

Instrumentation / logging

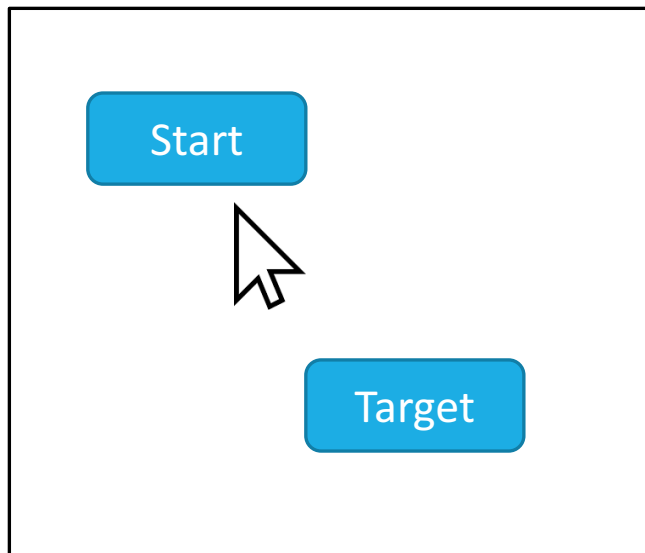
Instrument the software to record all interactions of the participant with the system

- key presses
- mouse movements
- screen touches / clicks
- reading time
- eye tracking
- etc.

The details of each interaction are recorded in a log and time stamped

Data can be analyzed to understand performance, cognitive load, user behavior, reactions to variations in task, system usage over time, and more.

Example: Log for clicking UI targets



```
-----History-----  
---Click!---  
At 1352079613888: START Button is hit.  
---Click!---  
---Click!---  
At 1352079660558: HI Button is hit.  
It takes 46670 to click the button.  
  
---Click!---  
At 1352079666294: START Button is hit.  
---Click!---  
At 1352079666941: HI Button is hit.  
It takes 647 to click the button.  
  
-----Data analysis:-----  
For Button 1  
Distance 228  
Size 50  
Time 46670 ms  
  
For Button 6  
Distance 907  
Size 110  
Time 647 ms|
```

Instrumentation / logging

- Useful for understanding interaction.
- Useful for web studies.
- Testing layouts, displays, GUI interfaces etc.
- Understanding users' reactions to variations in tasks and layout combinations.
- Testing the efficiency of the interface and its ease of use.
- Measuring levels completed in games, time to fill out forms, time to complete tasks, etc.
- Measuring features most used, most clicked on, etc.
- Measuring speed and performance, etc.

Quantitative surveys

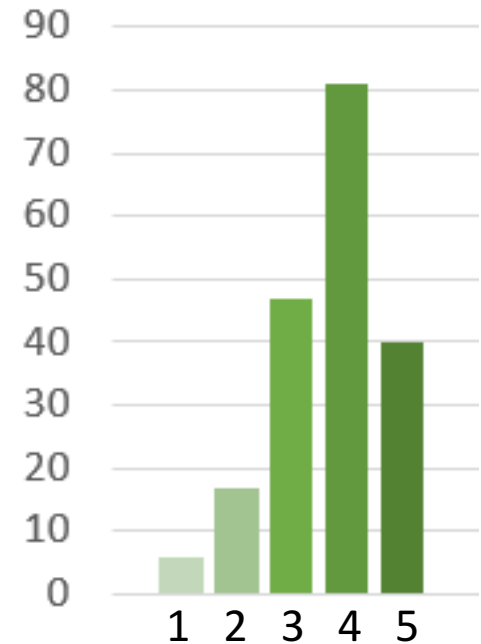
Numeric survey responses (e.g., how many times you bought a product)

Likert scale responses

- Odd (neutrality allowed) or even (forced choice) number of choices allowed

Statistics calculated for each question

- Mean, median, standard deviation, N-per-answer, etc.



Descriptive Statistics	
	Household income in thousands
Mean	59.59
Std. Deviation	67.130
N	1500
Median	40.00
Minimum	12
Maximum	1,079

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 - Quantitative surveys
- AB testing
- Activity

What is AB Testing?

A practical way to test different designs 😊

Also called “split testing” or “bucket testing”

A/B testing splits live traffic into two (or more) parts:

- Some users see the standard design ("A")
- Some users see an alternative design ("B")
- After collecting enough data, the one with the better performance “wins”

Multivariate testing

- More than 2 variations
- A/B/C/D...

What is AB Testing?

Empirical, data-driven method

- Real site, authentic users

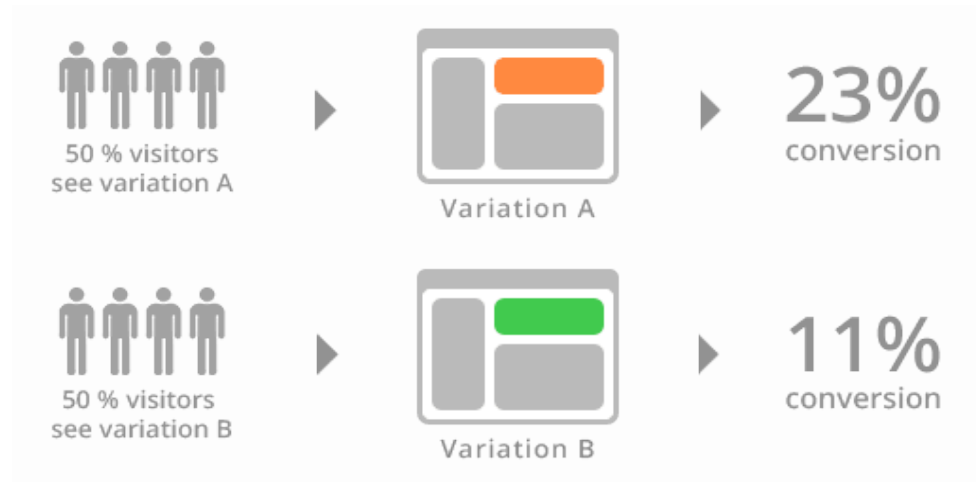
Controlled experiment

- Split users into (at least) two groups: Control and test(s)

Cookies can ensure an individual gets consistent version.

A metric

- Overall evaluation criteria (OEC) or key performance indicator (KPI)
- e.g., click-through rate, purchases



Process

Come up with a driving question:

- e.g. Can I increase click through rates from my home page

Formulate a hypothesis:

- e.g. Underlined links will outperform my current links

Calculate time to run test:

- Tools available to help you do this, e.g. [A/B Test Duration Calculator](#).

Run the test:

- X% of users get underlined links
- How to decide X?

Review results

Some examples...

Example 1: Sponsor a Child website

<https://whichtestwon.com/test/with-sliders-or-without/>

Key Performance Indicator (KPI):

- clicks on the sponsorship “Call To Action” button

Difference between versions:

- Version A: Sponsor a child page formatted with sliders
- Version B: Radically redesigned page without sliders

World Vision Building a better world for children

SEARCH

MY BASKET (0) SIGN IN BLOG

OUR IMPACT SPONSOR A CHILD WAYS TO GIVE GET INVOLVED ABOUT US MY WORLD VISION

Sponsor Child

Sponsoring a child is the most powerful way you can fight poverty
Become a World Vision child sponsor today—and change a child's world for good.

WHY SPONSOR?

Watch my video

Read my story

Name: Jose
Gender: Boy
Birth Date: Oct 04, 2007
Location: Mexico
Monthly Sponsorship: \$35

Sponsor Jose Today

Jose is waiting for a World Vision sponsor. He is 7 years old and lives in Mexico.

Like many children in this country, he needs your love and support to have access to things such as clean water, nutritious food, and an education, so he can grow up to be a healthy and productive adult.

SEARCH FOR A CHILD

Birth Month Birth Day Age Gender Worldwide Search for a Child

A

BENEFITS

HOW IT WORKS

WHO WE ARE

TESTIMONIALS

FAQ

THE BENEFITS OF CHILD SPONSORSHIP

For about \$1 a day, you'll provide children in need with access to life-saving basics like:

- Clean water
- Nutritious food
- Healthcare
- Education
- And more!

About Us
Who We Are
How We Work
Financial Accountability
Our Faith in Action
Careers & Internships

Our Impact
Child Protection
Clean Water
Disaster Relief
Economic Development
Education
Faith in Action
Food & Agriculture
Gender
Health
Interactive Map
U.S. Work

How You Can Help
Sponsor a Child
Monthly Giving
One-Time Donation
Gift Registry
Get Involved

Connect With Us
Contact Us & FAQ
Phone: 1-888-511-4548
name@example.com
NEWSLETTER SIGN UP

Navigate
Site Map
Mobile Site
Change Country/Region
World Vision International
한국어
中文

World Vision
P.O. Box 9716
Federal Way, WA 98003

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An Organization You Can Trust

In 2013, 83 percent of World Vision's total operating expenses were used for programs that benefit children, families, and communities in need. Learn more >

- 83% programs
- 12% fundraising
- 5% management & general

Every dollar donated becomes \$1.15 in impact to children and communities worldwide. How?

World Vision Building a better world for children

SEARCH

MY BASKET (0) SIGN IN BLOG

OUR IMPACT SPONSOR A CHILD WAYS TO GIVE GET INVOLVED ABOUT US MY WORLD VISION

Sponsor Child

My name is Leangheng
I'm a 10-year-old boy from Cambodia, and you can change my world for good!
Here are just a few facts, and help me reach my goal given just one \$35 a month can help transform my community and change my world.

Watch my video

Find a Child
Thousands of children are waiting for sponsorship around the globe. Find your perfect match!

Gender Country Age Birth Month Birth Day

This is my world in Cambodia

I live with my parents

My birthday is September 27. I'll be 11 this year!

I speak Khmer. Cambodian is my first language.

I am in primary school and my favorite subject is mathematics.

This is where I live!

My parents struggle to provide for my family.

I need the help.

Sponsorship is the **most effective** way to change my world

When you sponsor me for \$35 a month, you'll join with other sponsors, grants, product donations, and other donors to address challenges in my community so we can have:

- Access to clean safe water
- Improved nutrition and basic healthcare
- Education that can help break the cycle of poverty
- Opportunities about to reach tonight, steps to living well

Have questions? Learn more about how sponsorship works. >

What if Leangheng was your child?
Watch Megan's Sponsorship Story
"There's this part of me that wonders what it would be like to be a mom in 'those places' [Cambodia] and just at the same, we want the exact same thing for our kids."

I'd love to be part of your family
Help change my world in Cambodia by choosing to be my sponsor and my friend!

Become My Sponsor

An Organization You Can Trust

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83% programs
12% fundraising
5% management & general

Every dollar donated becomes \$1.15 in impact to children and communities worldwide. How?

B

And the winner is...

Version B

- 60.4% increase in clicks on the sponsorship button!

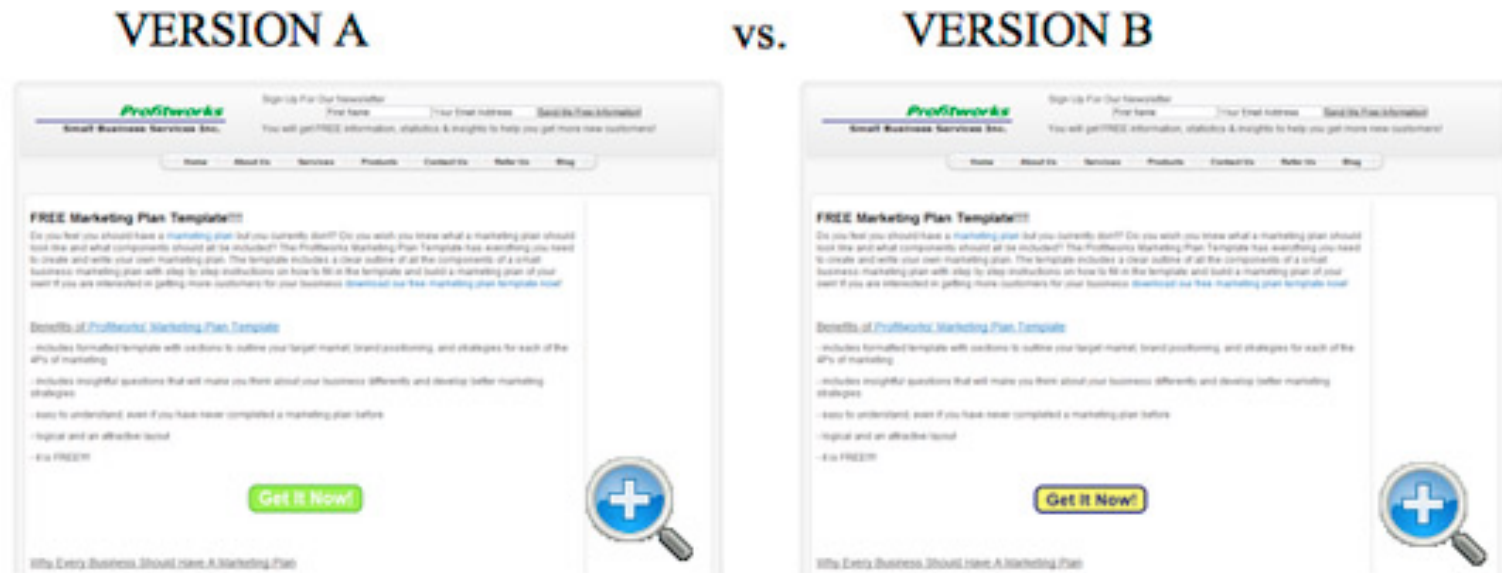
Used:

- Optimizely used
- 14 days 8,600 visitors.

Post-hoc rationalization

- story narrative
- updated visual flow
- clickable colored boxes were interactive

Example 2: Button Color Test Which Page Drove More Clicks?



Green is an affirming color that signifies positive action. BUT... it's been used with white text which completely washes the button out.

Version B's yellow and black button may be ugly but it is clear and led to a 14.5% increase in conversions.”

Example 3: Final Page in a 4 Step Sequence

CALIFORNIA CLOSETS®
Need. Want. Love.

Call 866.488.2751

Get the perfect walk-in closet to fit your space and your life
A California Closets design expert will show you how!

Book your in-home visit & explore more online
Click or call 866-488-2751

First
Last
Email
Phone
Zip

Yes, I'd like California Closets news by email

Schedule & Explore

Your free in-home consultation will include a 3-D rendering of your space and...

- ▶ We'll take into account your needs and the way you live
- ▶ We'll work within your budget
- ▶ We'll schedule around your busy lifestyle

  *“From our consultation to the installation, everything was seamless and stress-free!”* —Jennifer



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A

CALIFORNIA CLOSETS®
Need. Want. Love.

Call 866.488.2751

California Closets - How & Why

Sign-up today for your free design consultation —in your home!

Your consultation will include:

- ▶ Custom design to fit your needs & budget
- ▶ 3D preview of your new space!

First Name
Last Name
Email*
Phone*
Zip*
Best time to reach you?

Yes, I'd like California Closets news by email

Organize Me!



We are looking forward to hearing about your walk-in closet project!
Your free in-home consultation will include a 3-D rendering of your space and...

- ▶ We'll take into account your needs and the way you live
- ▶ We'll work within your budget
- ▶ We'll schedule around your busy lifestyle

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B

Example 3: Final Page in a 4 Step Sequence

Both pages are well-designed and both, seemingly, doing a good job

Version B

- video center piece, well-structured; it should convert

Version A had 439% higher performance.

Post-hoc rationalization

- text within the image brings focus
- form has fewer fields and looks shorter
- images give the page a more authentic and trustworthy feel

Benefits of AB testing

Compared with other methods, A/B testing has a few huge benefits:

1. It measures the actual behavior of customers in real-world conditions.
2. It can measure very small performance differences with high statistical significance because you can throw tons of traffic at each design.
3. It can resolve trade-offs between conflicting designs, guidelines, or qualitative usability findings.
4. It's cheap: once you've created the design alternatives you simply put both of them on the server and employ a tiny bit of software to randomly serve each new user one version or the other.
5. It's low risk: if one of the alternatives performs badly, you can simply turn it off or try again.

Limitations of AB testing

1. A/B testing can only be used for projects that have one clear, all-important goal (KPI).
2. The goal must be measurable by computer through user actions.
3. A/B testing provides data only on the element you're testing.
4. A/B testing only works for fully implemented designs. It's cheap to test a design once it's up and running, but implementation can take a long time.
5. Encourages a focus on short-term (and short-sighted) improvements.
6. No Behavioral Insights: you don't necessarily know **why** you get the measured results.

Final Page in a 4 Step Sequence

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Call 866.488.2751

Get the perfect walk-in closet to fit your space and your life
A California Closets design expert will show you how!

Book your in-home visit & explore more online
Click or call 866-488-2751

First:
Last:
Email:
Phone:
Zip:

Yes, I'd like California Closets news by email

Schedule & Explore

Your free in-home consultation will include a 3-D rendering of your space and...

- We'll take into account your needs and the way you live
- We'll work within your budget
- We'll schedule around your busy lifestyle

From our consultation to the installation, everything was seamless...
—Jennifer

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CALIFORNIA CLOSETS®
Need. Want. Love.

Call 866.488.2751

California Closets—How & Why

We are looking forward to hearing about your walk-in closet project!
Your free in-home consultation will include a 3-D rendering of your space and...

- We'll take into account your needs and the way you live
- We'll work within your budget
- We'll schedule around your busy lifestyle

Sign-up today for your free design consultation—in your home!

Your consultation will include:

- Custom design to fit your needs & budget
- 3D preview of your new space!

First Name:
Last Name:
Email:
Phone:
Zip:

Best time to reach you?

Yes, I'd like California Closets news by email

Organize My Info

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Post-hoc rationalization: text within the image brings focus, form has fewer fields, looks shorter, images give the page a more authentic/trustworthy feel.

Don't actually know why!

Take-aways

A/B testing can be useful and it definitely has its place

- Easy, cheap, fast, can lead to significant results.

Don't EVER rely solely on A/B testing

It's ALWAYS a good idea to combine methods

- Qualitative methods
- Other quantitative methods
 - Logging / instrumentation
- More...

Resources for doing AB testing

There are dozens of A/B consultants, tools, tips and tricks. Here are a few links:

[Robin Johnson](#), writing in Optimizely, gives you 71 different ideas on things to test, including website copy, visual elements and just plain common sense things such as whether you have a positive or negative spin on what you are trying to sell.

[Uri Bar-Joseph](#), writing in SearchEngineWatch, has eight rules for A/B testing, including focusing on one variable, choosing your groups randomly and measuring the results carefully.

Visual Website Optimizer (vwo.com) is testing software for marketers (i.e. if you don't want to do it yourself).

For some fun, take a look at these [12 results](#) that were somewhat counter-intuitive from WhichTestWon.com, a commercial A/B testing provider.

Activity

1. Work in pairs.
2. Create an A/B experiment for improving a commercial product of your choice (existing app or website)
 - Come up with a driving question – write it down
 - Formulate a hypothesis – write it down
 - Design an experiment to test your hypothesis (e.g. draw different variants)
 - Explain your choices: why did you pick these variants?
 - How long would you run your experiment for and why?
 - What results would you hope to see?
3. (If you're done) Discuss your AB experiment another team. Critique!
4. Write your name on your paper and turn it in.