

## Chapter 1

# Introduction to User Centered Design

- Introduction to User Centered Design:

Aspects of User Centered Design, Product Appreciation  
Assignment – Evaluating the product from user centered  
design aspects such as functionality, ease of use,  
ergonomics, aesthetics

# Bad designs

Elevator controls and labels on the bottom row all look the same, so it is easy to push a label by mistake instead of a control button.



People do not make same mistake for the labels and buttons on the top row. Why not?

# Opening the file drawer



- The handle on the top **doesn't** open the top file drawer.
- Instead, it pulls the whole file cabinet out from under the table.
- The handle to move the cabinet is very close to the top drawer.
- It is easy to mistake the top handle as the handle for the top drawer.

# Plugging in a USB connector



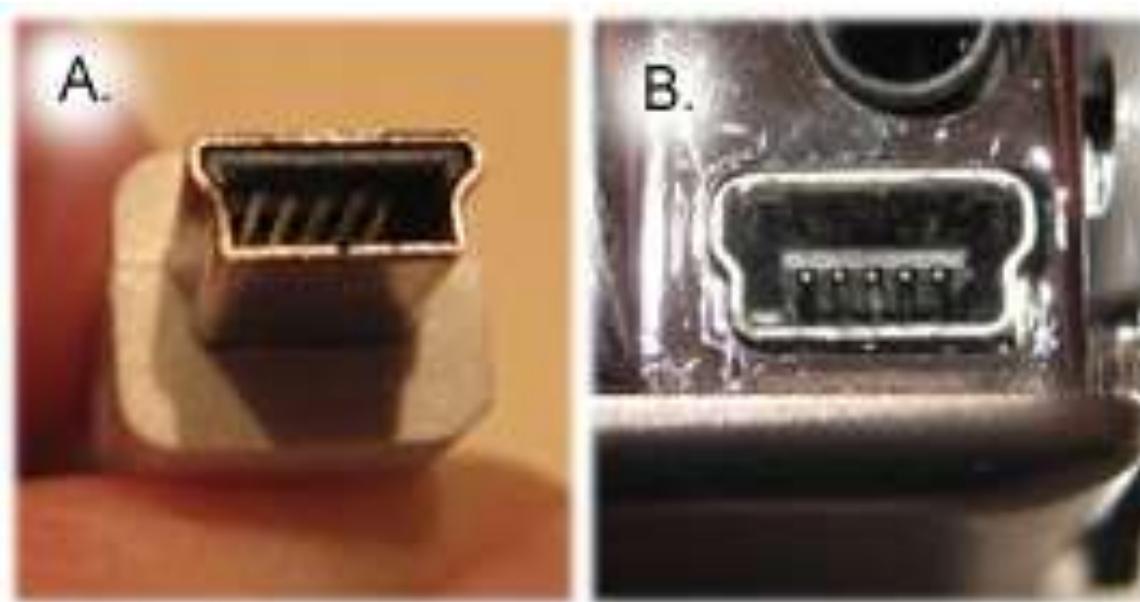
- Frequently turn it the wrong way.
- USB symbol on "top" of the connector so if the connector is oriented horizontally, the symbol faces up.
- That doesn't help if the connector needs to plug in vertically.

# Good design



If the handle on top had been recessed like the drawer handles as shown , it wouldn't be as likely to be used accidentally.

# Good Design



- If the connector could be inserted either way or work if it was asymmetrical, like the mini USB connector in Photo A., which plugs into B.

# Good design

Why is the TiVo remote much better designed than standard remote controls?

- Peanut shaped to fit in hand
- Logical layout and color-coded, distinctive buttons
- Easy-to-locate buttons



# Dilemma

Which is the best way to interact with a smart TV? Why?

- Pecking using a grid keyboard via a remote control
- Swiping across two alphanumeric rows using a touchpad
- Voice control using remote or smart speaker



# Zara- Unconventional navigation

The image shows a screenshot of the Zara website. At the top, there is a large, semi-transparent watermark of the word "ZARA" with a registered trademark symbol. To the left of the watermark is a small "X" icon. To the right are links for "CART" and "SEARCH". Below the watermark, the main navigation menu includes "WOMAN", "MAN", "KIDS", and "BEAUTY". On the left side of the page, there is a large image of a woman wearing a pink and yellow outfit. Below this image is a "NEW" section containing links: "COLLECTION", "SHOES&BAGS", "ZARATRIBUTE", "LINGERIE", "BEAUTY", "ZARASERIES", and "JOIN LIFE". At the bottom of the page, there are links for "HOME" and "MY ACCOUNT".

- WOMAN
- MAN
- KIDS
- BEAUTY

NEW

- COLLECTION
- SHOES&BAGS
- ZARATRIBUTE
- LINGERIE
- BEAUTY
- ZARASERIES
- JOIN LIFE

HOME

MY ACCOUNT

# IMDb-Cluttered layout

The screenshot illustrates a cluttered and visually overwhelming layout on the IMDb website. At the top, there is a large, dark promotional banner for the TV show "SEE" featuring Jason Momoa, Dave Bautista, and Alfre Woodard. Below this, the main content area is filled with various sections and advertisements. On the left, a prominent sidebar for Scoot McNairy includes a photo, a video player showing a scene from a movie, and links to his biography, filmography, and awards. To the right of this, there are several other promotional banners for "SEE" and other content. Below the main sidebar, there are sections for "Known For" (listing movies like "Argo", "Monsters", "12 Years a Slave", and "Frank") and "Child Stars, Then and Now" (showing photos of young stars like Macaulay Culkin and Miley Cyrus). The overall layout is dense and lacks a clear visual hierarchy, making it difficult for users to navigate and find specific information.

# CNN - Slow load time

**CNN** US World Politics Business Opinion Health Entertainment Style Travel Sports Videos

LIVE TV Edition   

**THANKSGIVING TRAVEL UPDATES**  
CNN Weather's live feed shows conditions in cities and at airports across the US 

PODCAST: Parts Unknown | **LIVE UPDATES:** Ahmaud Arbery killing trial | Thanksgiving weather | **TRENDING:** Word of the year | Dick Vitale | Black Friday deals

## RNC payments to Trump lawyers irritate GOP officials



A pair of payments is raising questions among former and current officials about the Republican party's priorities in a critical election year

SCOTUS will hear dispute over North Carolina GOP legislators' defense of voter ID law

Trump says Rittenhouse visited him at Mar-a-Lago

**LIVE UPDATES** Jury in trial of Arbery's killing asks to see video and hear 911 call from the shooting

Opinion: There is no conceivable justification for defense's treatment of Ahmaud Arbery



Analysts: The latest headache

Inflation isn't going away. Here's how to make money from it

Gop lost \$300 million in spins because of supply chain mess

Opinion: There may be something more going on with the Harris and Buttigieg gossip

Trump now has a ninth-degree black belt in taekwondo, but there's a catch

Biden administration Covid vaccination data shows mandates work, OMB says

San Francisco declares a water shortage emergency and urges residents to cut usage

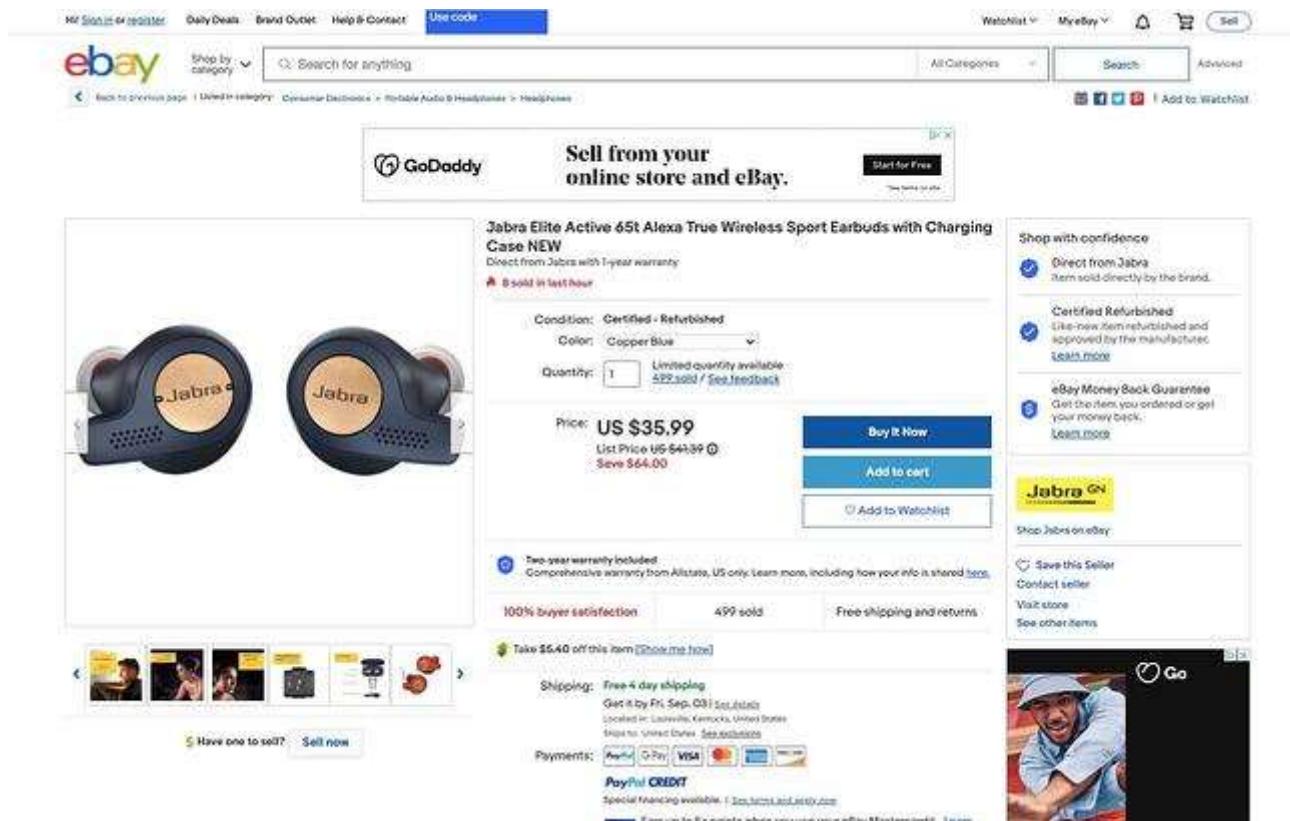
Jobless claims hit lowest level since 1969

Why some US cities are facing a spree of 'smash-and-grab' crimes

Daytime TV host reportedly eyeing Senate race in key swing state

Germany's incoming government unveils plans to legalize cannabis and phase out coal

# eBay-Complex product pages



The image shows a complex eBay product page for the Jabra Elite Active 65t Alexa True Wireless Sport Earbuds with Charging Case. The page includes a header with navigation links like 'Sign in or register', 'Daily Deals', 'Brand Outlet', 'Help & Contact', 'Use code...', 'Watchlist', 'My eBay', a shopping cart icon, and a 'Sell' button. The main search bar has the placeholder 'Search for anything...'. Below the search bar is a 'Shop by category' dropdown and a 'All Categories' link. The main content area features a 'GoDaddy' advertisement for selling from an online store. The product listing shows a large image of the earbuds and their charging case. The product title is 'Jabra Elite Active 65t Alexa True Wireless Sport Earbuds with Charging Case NEW'. It is described as 'Direct from Jabra with 3-year warranty' and '8 sold in last hour'. The condition is 'Certified - Refurbished' and the color is 'Copper Blue'. The price is listed as 'US \$35.99' with a note that it is 'List Price US \$49.99'. There are buttons for 'Buy It Now', 'Add to cart', and 'Add to Watchlist'. The page also displays a 'Two-year warranty included' badge, '100% buyer satisfaction', '499 sold', and 'Free shipping and returns'. A 'Take \$6.40 off this item' button is also present. The right sidebar contains sections for 'Shop with confidence' (including 'Direct from Jabra', 'Certified Refurbished', and 'eBay Money Back Guarantee'), a 'Jabra' seller badge, and links to 'Save this Seller', 'Contact seller', 'Visit store', and 'See other items'. At the bottom, there is a 'Payments' section with logos for American Express, PayPal, and Visa, and a note about 'Special financing available'. A small image of a smiling person is also visible in the bottom right corner.

# What to design

Need to take into account:

- Who the users are
- What activities are being carried out
- Where interaction is taking place

Need to optimize the interactions users have with a product:

- So that they match the users' activities and needs

# What is user centered(interaction) design?

“Designing interactive products to support the way people communicate and interact in their everyday and working lives.”

Sharp, Rogers, and Preece  
(2019)

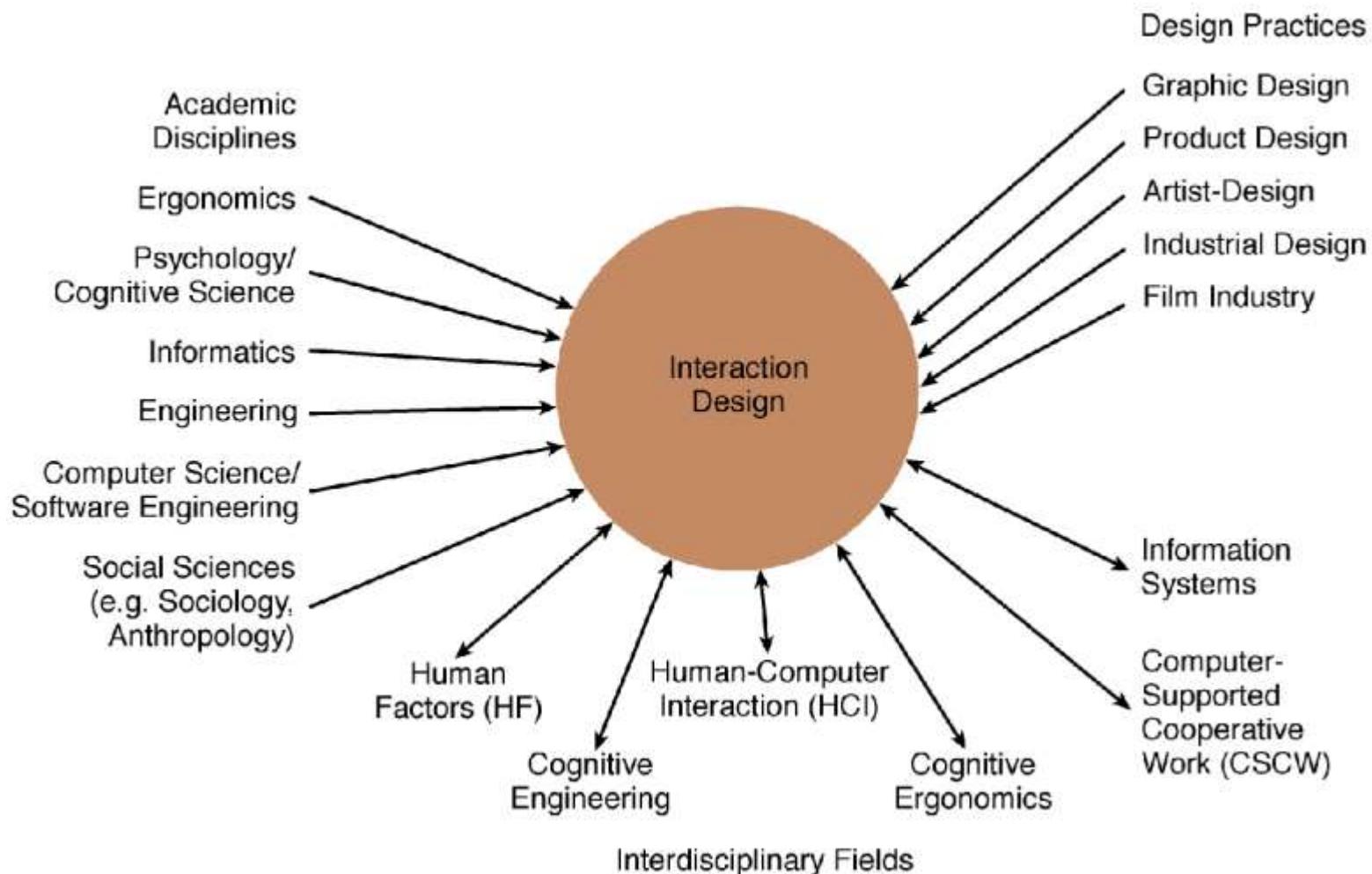
“The design of spaces for human communication and interaction.”

Winograd (1997)

# Goals of interaction design

- Develop usable products
  - Usability means easy to learn, effective to use, and provides an enjoyable experience
- Involve users in the design process

# Interaction design



# Interaction design in business

Large number of ID consultancies. Examples of well known ones include:

- **Nielsen Norman Group**: “help companies enter the age of the consumer, designing human-centered products and services”
- **Cooper**: “From research and product to goal-related design”
- **IDEO**: “creates products, services and environments for companies pioneering new ways to provide value to their customers”

# Usability goals

- Effective to use
- Efficient to use
- Safe to use
- Have good utility
- Easy to learn
- Easy to remember how to use

# The user experience

How a product behaves and is used by people in the real world

- The way people feel about it and their pleasure and satisfaction when using it, looking at it, holding it, and opening or closing it
- “Every product that is used by someone has a user experience: newspapers, ketchup bottles, reclining armchairs, cardigan sweaters.” (Garrett, 2010)
- “All aspects of the end-user's interaction with the company, its services, and its products. (Nielsen and Norman, 2014)

Cannot design a user experience—only can design *for* a user experience

# Why was the iPod user experience such a success?



**Figure 1.6** The iPod Nano Touch

Source: ©Press Association, reproduced with permission.

- Quality user experience from the start
- Simple, elegant, distinct brand, pleasurable, must have fashion item, catchy names, cool...

# Core characteristics of interaction design

- Users should be involved throughout the development of the project
- Specific usability and user experience goals need to be identified, clearly documented, and agreed to at the beginning of the project
- Iteration is needed through the core activities

# Why?

## Help designers:

- Understand how to design interactive products that fit with what people want, need, and may desire
- Appreciate that one size does not fit all (for example, teenagers are very different to grown-ups)
- Identify any incorrect assumptions they may have about particular user groups. (for example, not all old people want or need big fonts)
- Be aware of both people's sensitivities and their capabilities

# Accessibility and inclusiveness

**Accessibility:** the extent to which an interactive product is accessible by group of people

- Focus is on people with disabilities; for instance, those using apple voiceover(screen reader,spoken descriptions)

**Inclusiveness:** making products and services that accommodate the widest possible number of people

- For example, smartphones designed for all and made available to everyone regardless of their disability, education, age, or income

# Disability

Disabilities can be classified as:

- Sensory impairment (such as loss of vision or hearing)
- Physical impairment (having loss of functions to one or more parts of the body after a stroke or spinal cord injury)
- Cognitive (including learning impairment or loss of memory/cognitive function due to old age)

Each type can be further defined in terms of capability:

- For example, someone might have only peripheral vision, be color blind, or have no light perception

# Cultural differences

5/21/2015 versus 21/5/2015?

- Which should be used for international services and online forms?
- Why is it that certain products, like smartphones, are universally accepted by people from all parts of the world, whereas people from different cultures react to websites differently?

# Visibility - poor interface



- This is a control panel for an elevator
- How does it work?
- Push a button for the floor you want?
- Nothing happens. Push any other button?  
Still nothing. What do you need to do?
- It is not visible as to what to do!

# Visibility - Improving on a poor interface



...with this elevator, you need to insert your room card in the slot by the buttons to get the elevator to work!

How would you make this action more visible?

- Make the card reader more obvious
- Provide an auditory message that says what to do (which language?)
- Provide a big label next to the card reader that flashes when someone enters
- Make relevant parts visible
- Make what has to be done obvious

# What do I do if I am wearing black?

Invisible automatic controls can make it more difficult to use



# Feedback

- Sending information back to the user about what has been done
- Includes sound, highlighting, animation, and combinations of these
  - For example, when screen button is clicked, it provides sound or red highlight feedback:

 → “ccclichhk”

 → 

# Feedback

- When a user finally takes an action or interacts with our product, they often get an immediate reward of more content or a completed task.
- A well designed user experience offers us feedback that keeps us reassured we are on track.
- Digitally, feedback appears in the form of loading bars, error messages, vibrations, etc.

- In a tangible example, if you've ever turned your car key in the ignition and heard the engine purr—that is great feedback, you know then to shift into drive.
- Feedback is the error message you receive when you type in the wrong password; it's the delightful pinging sound you hear when you've processed a payment in the app store.

# Constraints

- Restricting the possible actions that can be performed
- Helps prevent user from selecting incorrect options

# Logical or ambiguous design?



- Where do you plug the mouse?
- Where do you plug the keyboard, in the top or bottom connector?
- Do the color-coded icons help?

# How to design them more logically



(A) provides direct adjacent mapping between icon and connector



(B) provides color coding that associates the connectors with the labels

# Consistency

- Design interfaces to have similar operations and use similar elements for similar tasks. (for example, always use Ctrl key plus first initial of the command for an operation: Ctrl+c, Ctrl+s, Ctrl+o)
- The main benefit is that consistent interfaces are easier to learn and use

# When consistency breaks down

- What happens if there is more than one command starting with the same letter? (for example, save, spelling, select, style)
- You have to find other initials or combinations of keys, thereby breaking the consistency rule (for example, Ctrl+s, Ctrl+shift+l)
- Increases learning burden on user, making them more prone to errors

# Internal and external consistency

- Internal consistency refers to designing operations to behave the same within an application  
(eg: your logo is the same online and in print)
- External consistency refers to designing operations, interfaces, and so on to be the same across applications and devices  
(eg: the **user interface of Adobe products**. Once you know Photoshop it is much easier to reuse the same knowledge to start using Illustrator and so on.)

# Keypad numbers layout

A case of external inconsistency

(a) phones, remote controls

1	2	3
4	5	6
7	8	9
0		

(b) calculators, computer keypads

7	8	9
4	5	6
1	2	3
0		

# Affordances: to give a clue

- Refers to an attribute of an object that allows people to know how to use it. (For example, a mouse button invites pushing, a door handle affords pulling)
- Norman (1988) used the term to discuss the design of everyday objects
- Has since been popularized in interaction design to discuss how to design interface objects (for example, scrollbars to enable moving up and down; icons to click on)

# What does “affordance” have to offer interaction design?

- Interfaces are virtual and do not have affordances like physical objects
- Norman argues that it does not make sense to talk about interfaces in terms of ‘real’ affordances
- Instead, interfaces are better conceptualized as ‘perceived’ affordances:
  - Learned conventions of arbitrary mappings between action and effect at the interface

# Bringing cognitive psychology knowledge to HCI

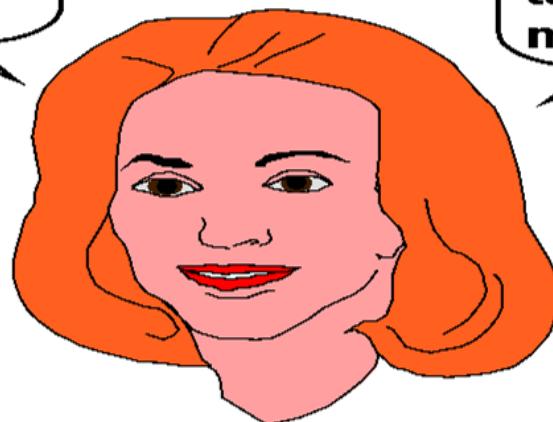
**What goes on in the mind?**

**perceiving..  
thinking..  
remembering..  
learning..**

**understanding others  
talking with others  
manipulating others**

**planning a meal  
imagining a trip  
painting  
writing  
composing**

**making decisions  
solving problems  
daydreaming...**



# Core cognitive aspects

- Attention
- Perception and recognition
- Memory
- Reading, speaking and listening
- Problem-solving, planning, reasoning and decision-making, learning
- Here we focus on attention, perception & recognition, & memory

# Attention

- Selecting things to concentrate on from the mass around us, at a point in time
- Information at the interface should be structured to capture users' attention, e.g. use perceptual boundaries (windows), colour, sound and flashing lights

# Design implications for attention

- Make information salient when it needs attending to
- Use techniques that make things stand out like colour, ordering, spacing, underlining, sequencing and animation
- Avoid cluttering the interface - follow the google.com example of crisp, simple design
- Avoid using too much because the software allows it

# An example of over-use of graphics



# Perception and recognition

- How information is acquired from the world and transformed into experiences
- Obvious implication is to design representations that are readily perceivable, e.g.
  - Text should be legible
  - Icons should be easy to distinguish and read

# Which is easiest to read and why?

What is the time?

# Memory

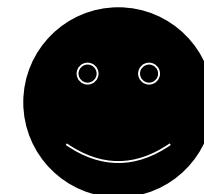
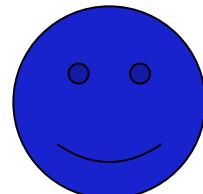
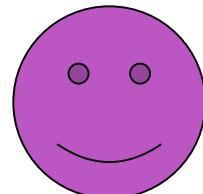
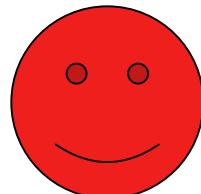
- Involves encoding and recalling knowledge and acting appropriately
- We don't remember everything - involves filtering and processing
- We recognize things much better than being able to recall things
  - The rise of the GUI over command-based interfaces
- Better at remembering images than words
  - The use of icons rather than names

# The problem with the classic '7±2'

- George Miller's theory of how much information people can remember
- People's immediate memory capacity is very limited
- Many designers have been led to believe that this is useful finding for interaction design

# What some designers get up to...

- Present only 7 options on a menu
- Display only 7 icons on a tool bar
- Have no more than 7 bullets in a list
- Place only 7 items on a pull down menu
- Place only 7 tabs on the top of a website page
  - [But this is wrong? Why?](#)



# **Affordance, Signifier, Mapping and Feedback**

# Affordance

- An affordance is the relationship between an object and the actions a person can take with that object.
- For example, a button affords pressing, a door handle affords pulling or turning, and a smartphone screen affords all types of interactions like swiping, tapping, pinching, and scrolling.
- Affordances rarely exist on their own. Meaning that a product or experience will have functionality built-in, but there are almost always clues designed to orient the user towards affordances.

- A good example of Affordance on a technological aspect is the volume slider on your computer.
- Its simple, and easy to read and understand, explaining what it is doing while you are operating it.



# Implicit Affordance



# Explicit Affordance

Amazon.ca

All dog food

Hello, Sign in Account & Lists Returns & Orders Try Prime Cart

Prime Day is Oct 13-14

Best Sellers Deals Store New Releases Gift Ideas Customer Service Electronics Home Books Coupons

Pet Supplies Bestsellers Dogs Cats Small Animals Fish & Aquatics Birds Brands Deals Subscribe & Save Pet Profile

Back to results



Roll over image to zoom in

VIDEO

Hill's Science Diet Adult Large Breed Lamb Meal & Brown Rice Recipe Dry Dog Food, 33 lb Bag

Visit the Hill's Science Diet Store

4.5 out of 5 stars 492 ratings | 6 answered questions

Amazon's Choice for "science diet dog food"

Price: CDN\$ 68.99 & FREE Shipping. Details

Coupon  Apply CDN\$ 5.00 coupon on first Subscribe and Save order only.

Details

New (2) from CDN\$ 68.99 + FREE Shipping

Size: 33 lb

Brand: Hill's Science Diet

Flavour: Lamb Meal & Rice

Item Weight: 33 Pounds

Sensitive Ingredient Information: Chicken Meat Free

Item form: Dry

See more

One-time purchase CDN\$ 68.99 FREE Shipping Arrives: Wednesday, Oct 7 Ships from: Amazon.ca Sold by: Amazon.ca

Subscribe & Save: 5% 15% CDN\$ 65.54

Save 5% now and up to 15% on repeat deliveries. No fees. Cancel at any time. Learn more Get it Thursday, Oct 8

In Stock.

Qty: 1

Deliver every: 1 month (Most common)

Set Up Now

Auto-deliveries sold by Amazon.ca

About this item

- Adult dry dog food is specially formulated to fuel the energy needs of large breed dogs
- Supports your grown dog's joint health with natural sources of glucosamine & chondroitin
- Maintain your dog's healthy skin and shiny coat with nourishing omega-6 fatty acids & vitamin E
- Promotes lean muscle in large dogs with high-quality protein

Add to Wish List

New (2) from CDN\$ 68.99 + FREE Shipping

Share    

# Signifiers

- Once you've bestowed your product with affordances, you must then decide how you can give subtle but intuitive clues to your user about how to interact with them. These clues are called **signifiers**.
- These can be any kind of perceptible information that signals your user to act in a desired way.
- Signifiers can be explicit textual information, sound, texture, lighting, color, symbols, or even proximity of objects to one another.
- With smartphones and laptops, for example, we rely on cues like shading, color, text, sounds, and haptics(touch and motion).

- “Signifiers” can be used to just mean component labels, but in more complex discussions or within design systems, signifiers can also be:
  - The colour of the component when aligned to accepted digital design patterns
  - Text labels on or near a component
  - Icon labels on or near a component
  - The emphasis of any text (bold, italic, underline)

# Good examples of signifiers





Source: Kia



# Mindfulness for any moment

Stress less. Move more. Sleep soundly.  
There's something for everyone.

• • •

[Continue](#)

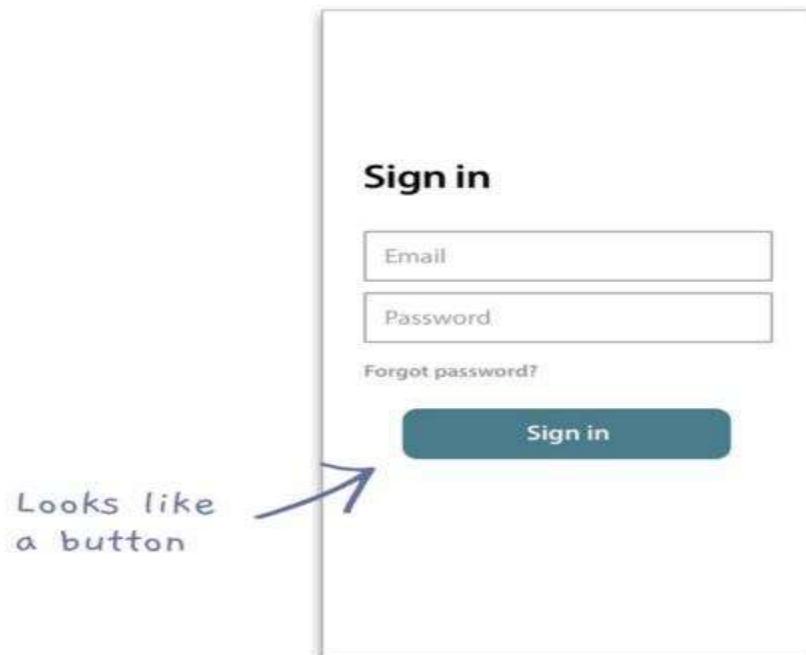


# Affordances and signifiers together

- Through UX and UI design of an interface, we can layer signifiers onto an affordance to communicate:
  - a) What the thing can do (*affordance*)
  - b) Its current state or significance (*signifier*)

**Example:** Perceiving a chair, the structure, plains and stability, we know it can be sat or stood on.

**Example:** Perceiving a button on a screen, we know it is something that can be pressed to produce an action.



**Example:** The chair has a balloon tied to it, implying that it is reserved for some special occasion.

**Example:** The button is greyed out, suggesting it is inactive.

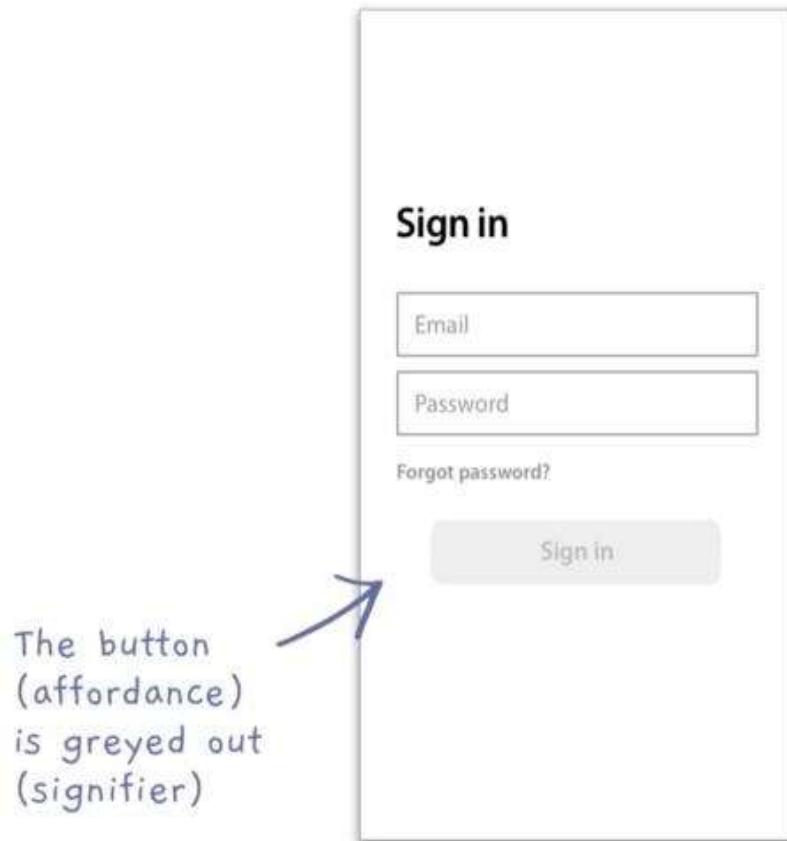


Looks like a  
button, but  
inactive or  
disabled



## Example: The button (*affordance*) is greyed out (*signifier*)

Source: medium/@h\_jolcke



The button  
(affordance)  
is greyed out  
(signifier)

- **Example:** There are two buttons (*affordance*) and it is perceivable that one is probably the preferred action (*signifier*)



It is perceivable that one button has greater importance or relevance (signifier)

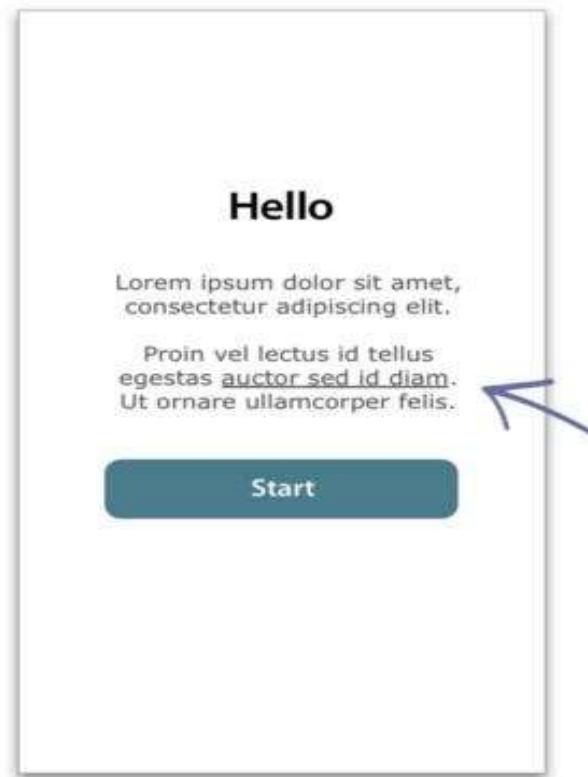
- **Example:** A button (*affordance*) which uses the interface's primary action style (*colour signifier*) which describes the action (*word signifier*) which includes a forward arrow (*directional signifier*).



Affordance (button)  
+ colour  
+ text  
+ icon

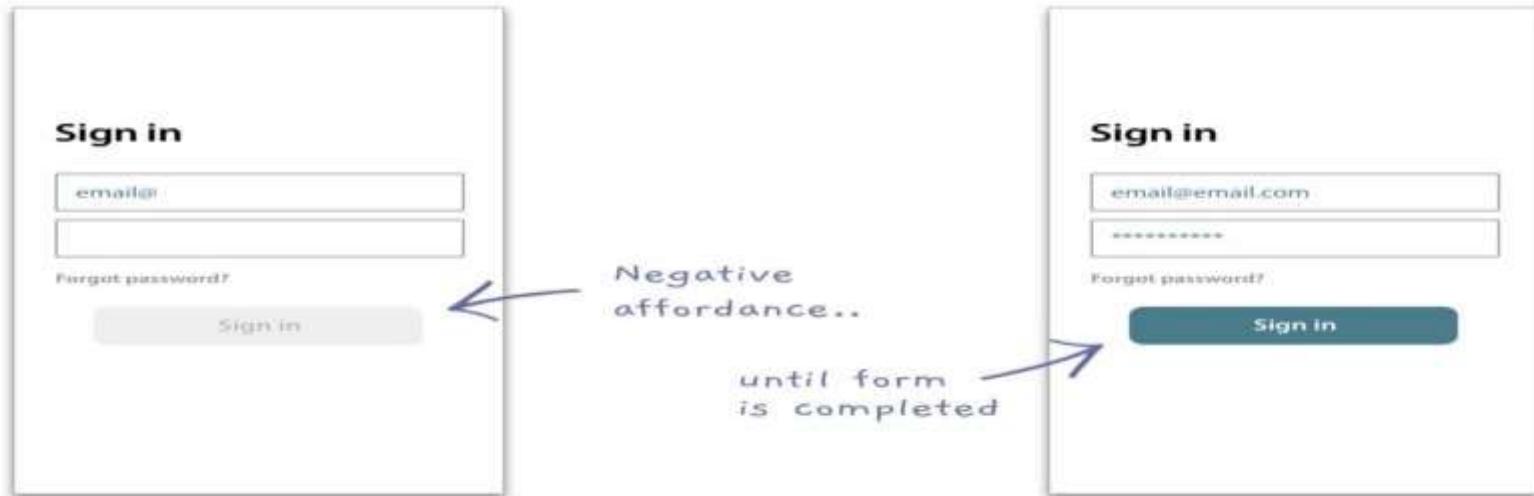
## False affordance

- The thing looks like it can do something, but it can't.



Is this a link?  
If not, it's a false  
affordance

# Negative affordance



- There is an affordance such as a button, but it is not active.
- It looks like a button, it is a button, but it doesn't behave like a button.
- This is ok if it's a temporarily disabled button, which becomes active when the user completes a form, but not if it's just a button on a screen doing nothing.

# Hidden affordance

Source: medium/@h\_lucke



Ghost buttons  
can hide  
functionality  
from users



Hover states  
rely on user  
discovery. And  
desktop devices.

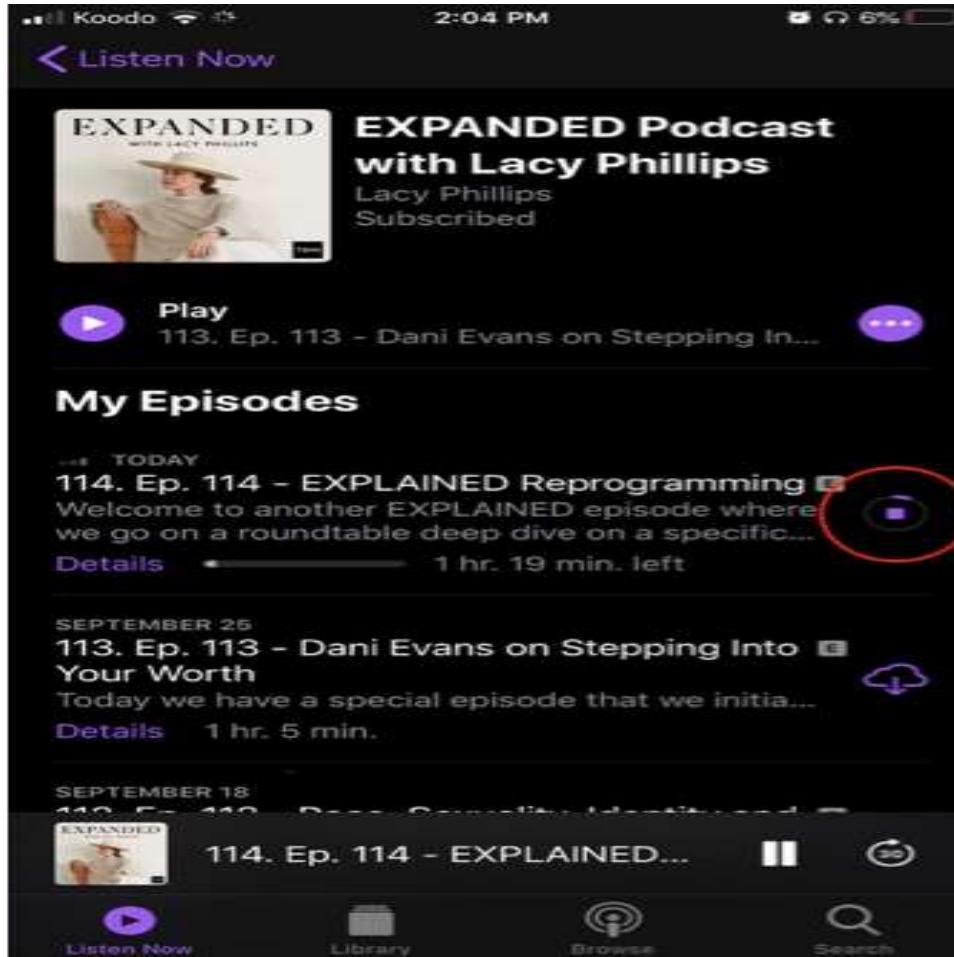


- The thing is not perceivable or available until the user interacts with it.
- A classic example is the ghost button, which I see missed all the time by users. Almost invisible until you serendipitously stumble upon it or hover over it and then you can use the interface.

# Feedback

- When a user finally takes an action or interacts with our product, they often get an immediate reward of more content or a completed task.
- A well designed user experience offers us feedback that keeps us reassured we are on track.
- Digitally, feedback appears in the form of loading bars, error messages, vibrations, etc.

- In a tangible example, if you've ever turned your car key in the ignition and heard the engine purr—that is great feedback, you know then to shift into drive.
- Feedback is the error message you receive when you type in the wrong password; it's the delightful pinging sound you hear when you've processed a payment in the app store.



- ✓ Feedback reassures us that we are making progress.
- ✓ For example, when downloading a podcast, if you didn't see any type of loading bar you might assume that the content isn't yours yet or that the app doesn't allow downloading.

Start a meeting

Join a meeting

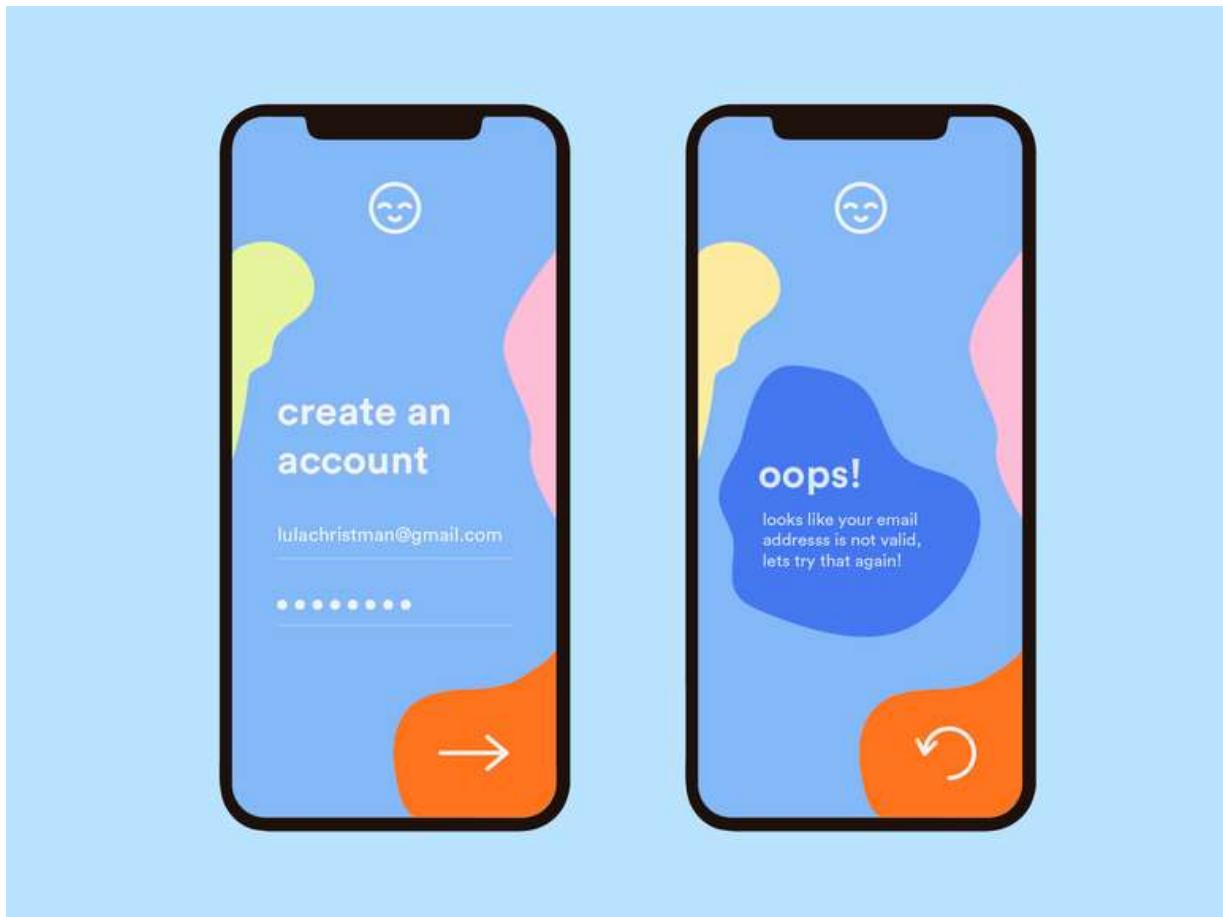
Hangouts

Conversation moved to Trash.

[Undo](#)

X





# Visibility

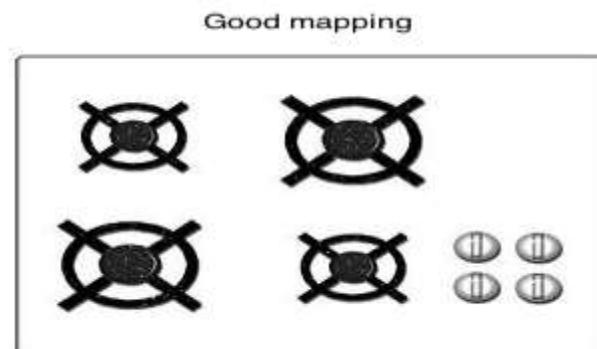
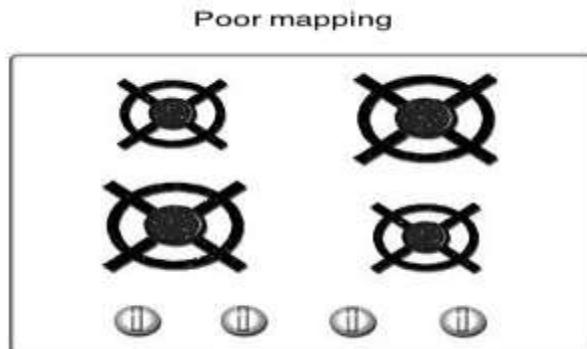
- Visibility is the basic principle that the more visible an element is, the more likely users will know about them and how to use them.
- Equally important is the opposite: when something is out of sight, it's difficult to know about and use.
- The skill in applying this principle is realizing that you can't make everything visible, because it'll ultimately clutter the interface but instead need to prioritize what interface elements are by far the most important for the user experience and prioritize their visibility.

- The trade-off between hamburger side-bar menus and tab-bar menus in mobile applications is a very recent design debate centered around this very principle of visibility.
- While the hamburger menu provides a convenient place to store a variety of menu items in a mobile app, it comes at a huge disadvantage: the lack of visibility of the contained menu items.
- We've seen a shift in major apps like Facebook away from hamburger menus and back toward tab-bar menus to improve the visibility of their key experiences.



# Mapping

- Mapping is about having a clear relationship between controls and the effect they have on the world.
- Mapping should be as natural as possible.
- Stove tops are a great example . When you see the first image, the mapping is not very clear because it's difficult to determine which control operates each burner. Versus the second image, it's far clearer the control that controls each burner, which has a better mapping.



- This slider also has a strong mapping, since it's clear moving it to the right will increase its value versus moving it to the left will decrease it.



# ERGONOMICS

- ❖ **Ergonomics** is about ensuring a good fit between people and the things they interact with.
- ❖ Ergonomics should be considered in the design of every product, system or environment.
- ❖ Ergonomists can help you to identify which **user characteristics** you should take into account during your design process.
- ❖ As ergonomists, our goal is to influence the design of man-machine systems so that human capabilities and limitations are considered from the early stages of the design process, and are accounted for in the final design.
- ❖ Knowledge and experience, show that a design that considers such issues will result in an optimal system that enhances productivity, safety and job satisfaction.

- ❖ **Soft ergonomics** is the study of designing virtual interfaces that cater towards the wellness of the human body, its emotional and cognitive abilities.
- ❖ Soft ergonomics can be defined as the ability of any virtual interface(computer application, website, ATM options, parking meter etc.) to make it comfortable for the user to use the interface while working on the user's request.
- ❖ It tries to find a compromise between user expectations, system workflow and aesthetics.
- ❖ Users from various cultural and technological background are exposed to a common interface. The interface developer seeks to ensure that the interface does not harm the user psychologically, physiologically or emotionally.

Soft ergonomics generally takes into account the following human factors when building a virtual interface:

## **1. Physical Limitations:**

- Not all who use a virtual interface are physically equal.
- If the designed interface only caters to right-handed individuals, or people within a certain height range, then the interface might need a redesign.
- One of the leading discussion is with respect to visually impaired users.

## **2. Emotional Needs:**

- The interface should be 'designed for the occasion' or context.
- It should not leave the user confused, either by how to start using the interface or what to do when an error occurs.
- Confusion leads to frustration, which eventually builds stress in the body causing long term emotional damage.

### **3. Cognitive Abilities:**

- If the product (e.g. software application, website) is designed for any casual user, then the designer should not expect that all users will be experts with high cognitive abilities.
- The usage of the application should not need the user to know a lot of information prior to using the interface.
- For example, using an automated teller machine can require memorizing a pin number but not the account number.

# Criteria for Soft Ergonomics

The following lists (non-exhaustive) some of the most common criteria for evaluating soft ergonomics.

➤ **Consistency:**

- ❑ The design should be consistent across the entire application.
- ❑ Consistent sequence of actions, identical terminologies and platform conventions should be followed throughout the application.

➤ **Efficiency:**

- ❑ The virtual interface should allow efficient use of user's time. The screens should load and display content within acceptable amount of time.
- ❑ The more than expected time a user has to wait, more stress is built into the human body causing long term damage.
- ❑ The interface should also have functionality for advanced users. While being non-obtrusive to novice users, accelerators or shortcuts should be available for experienced users.

➤ **Design:**

- The system should preferably have minimalistic and aesthetically pleasing design.
- Minimalistic design help user easily consume the data and hence there is less stress on the human mind and aesthetically pleasing design increases the 'feel good' factor in the user.

➤ **Memory:**

- User's memory load should be minimized.
- All information that a user needs from the application to perform a task should be presented or easily retrievable by the user.

➤ **Context Help:**

- The 'Help' menu and options that give context help should be always available to the user.

# UCD Principles

From Jeffrey Rubin, Handbook of Usability Testing:

- **Early focus on users and tasks**
  - Structured and systematic information gathering
  - Designers trained by experts before conducting data collection sessions
- **Empirical Measurement and testing of product usage**
  - Focus on ease of learning and ease of use
  - Testing of prototypes with actual users
- **Iterative Design**
  - Product designed, modified and tested repeatedly.
  - Allow for the complete overhaul and rethinking of design by early testing of conceptual models and design ideas.

# User-Centered Design Process

- Design is based upon an explicit understanding of users, tasks, and environments; is driven and refined by user-centered evaluation; and addresses the whole user experience.
- The process involves users throughout the design and development process and it is iterative.

# Phases of the UCD process:

The following are the general phases of the UCD process:

- **Specify the context of use:** Identify the people who will use the product, what they will use it for, and under what conditions they will use it.
- **Specify requirements:** Identify any business requirements or user goals that must be met for the product to be successful.
- **Create design solutions:** This part of the process may be done in stages, building from a rough concept to a complete design.
- **Evaluate designs:** Evaluation - ideally through usability testing with actual users - is as integral as quality testing is to good software development.



# 6 Laws that Help You Create a Better Design

- ❖ A common goal of every product — to make the users' life easier.
- ❖ Some famous principles from psychology, philosophy and economics that you can apply to your design.
  - *Hick's Law*
  - *Jakob's Law*
  - *Ockham's Razor Law*
  - *Fitt's Law*
  - *Weber's Law*
  - *Pareto's Law*
- ❖ Apart from the basic design principles, there are other rules or laws that you can follow to make your design stand out like the *golden rules*.

# Fitts' Law: Make it simple, but significant

- Fitts's law is a predictive model of human movement developed by Paul Fitts, an American psychologist.
- Fitts' law states that the amount of time required for a person to move a pointer (e.g., mouse cursor) to a target area is a function of the distance to the target divided by the size of the target.
- Thus, the longer the distance and the smaller the target's size, the longer it takes.
- By his law, fast movements and small targets result in greater error rates, due to the speed-accuracy trade-off.

- Fitts' law is widely applied in user experience (UX) and user interface (UI) design.
- For example, this law influenced the convention of making interactive buttons large (especially on finger-operated mobile devices)—smaller buttons are more difficult (and time-consuming) to click.
- Likewise, the distance between a user's task/attention area and the task-related button should be kept as short as possible.

- When it is used in a design, it means that your buttons should be large, obvious and the distance between one action to the next should be minimised.
- Pop-up menus better support immediate selection of interactive elements than dropdown menus as the user does not have to move the cursor from its current position.



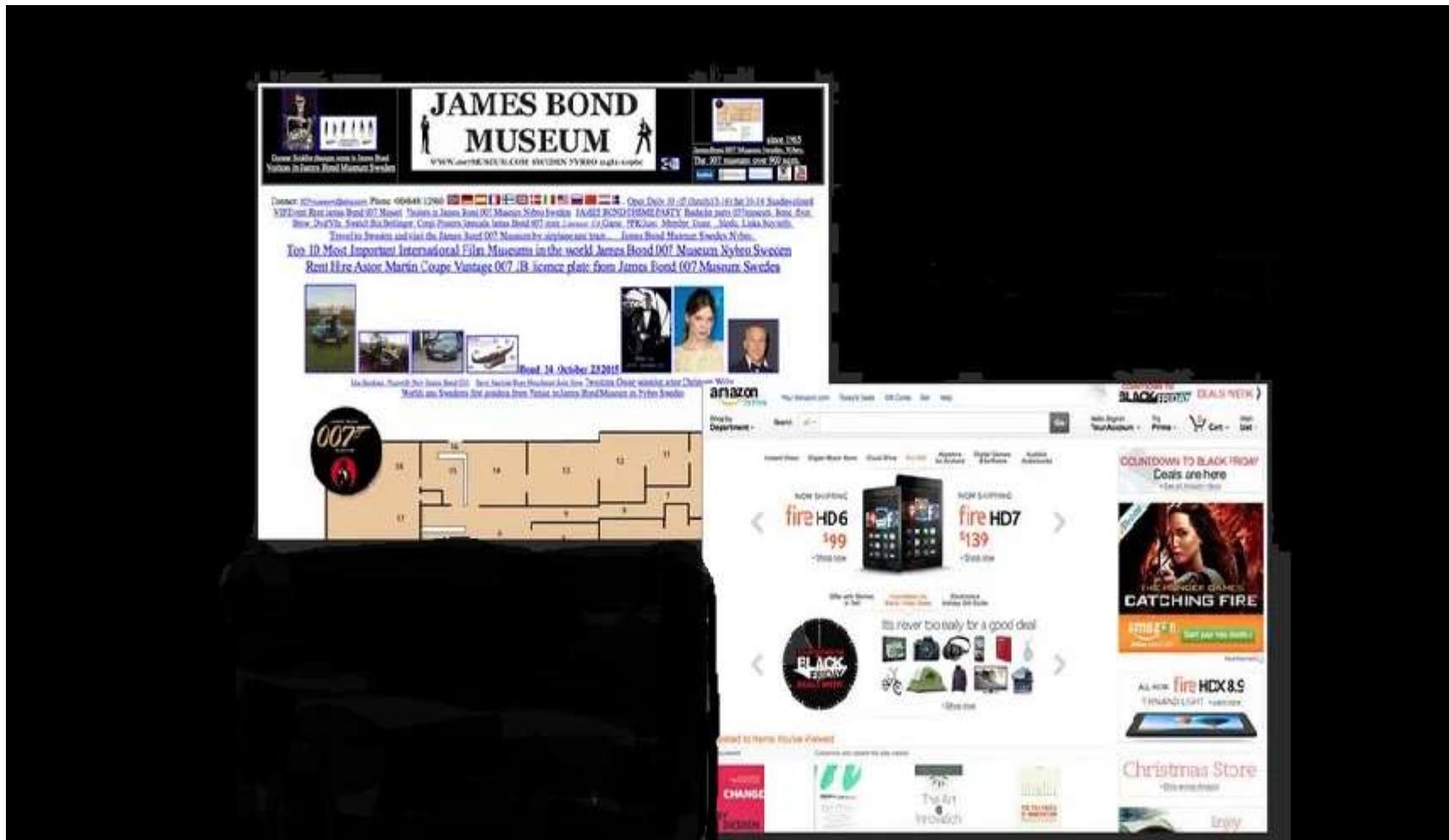
Expected Likely Prime Pixel Area

# Hick's Law: More options, more problems

- Hick's law, a psychology principle that is named after two psychologists, William Edmund Hick and Ray Hyman, states that the more options available for the users, the longer time it will take for them to make a decision.
- Delivering a good user experience requires that first you find out the functionalities that will answer users needs; second, you need to guide them to the specific functions they need *most*.
- If users end up stuck in the decision-making process of “what next?”, they may become confused, frustrated, or leave your website.

- Hick's Law is a simple idea that says that the more choices you present your users with, the longer it will take them to reach a decision.
- Users bombarded with choices have to take time to interpret and decide, giving them work they don't want.
- When there are lots of options available, your users would need to learn, consider and weigh all the options before making up their mind. That means it takes a longer time to reach their goal.
- Apart from this, more options could mean more problems, especially if there is no clear explanation for each option.

- You can see Hick's Law in action in the navigation of almost any website.



# Follows Hicks law or not?



# Weber's Law: Just Noticeable Difference

- Weber's law is named after a German physician, Ernst Heinrich Weber, also called **Weber-Fechner law**, historically important psychological law quantifying the perception of change in a given stimulus.
- The law states that the change in a stimulus that will be just noticeable is a constant ratio of the original stimulus.
- A **stimulus** is anything that causes a reaction in an organism.
- **Perception** is what happens when an organism takes in a stimulus and makes meaning of it.
- Weber's law is an essential concept because it helps understand how people perceive different stimuli.
- The law reveals that perception of stimuli is relative, not absolute.

- Weber's Law can be used for various sensory modalities in GUIs such as brightness, loudness, line length, visual weight of fonts in typography, color matching etc.
- Many times large amount of information is required to be displayed on a limited size computer screen and in various forms viz. text, pictures, drawings, maps, graphs, videos etc.
- Poor visual design of user interface lacks the ability of differentiating between two close enough visual stimuli e.g. two lines with different thicknesses in a map (for wide roads and narrow lanes). What is this threshold of line thickness that may lead to noticeable difference is governed by Weber's law.
- The threshold of noticeable difference between color shades is also governed by Weber's law.

- The law explains that the perceived change in stimuli is proportional to the original stimuli, together with the just noticeable difference, it means that the size of the just noticeable difference (the slightest change in stimuli that can be observed or noticed) is in proportion to the original stimuli.
- When we redesign a product, we should think about how the users adapt to the changes. Usually, if your product has a drastic change, no matter how good the new design is, the users would still think the old one is better. This is a natural human behaviour.
- What you should do instead is — change gradually, so gradually that the users could not see a significant difference. This helps them adapt to and accept the new design.

# Jakob's law

- Jakob's law was invented by Jakob Neilsen, a user advocate.
- This law states that asking users to adopt new behaviours or even modify their existing behaviours is very, very hard.
- Your users prefer your website to work in the same way as other websites.
- For instance, if your website has lots of content, there should be a search function, your website footer should contain links to important pages, your website logo should be clickable and linked to the homepage.
- Users do not like surprises, they prefer something that is familiar so they wouldn't need to learn how to use your website.

# Ockham's Razor Law

- Ockham's Razor is a philosophy principle by William of Ockham, a Franciscan friar in the 14th century which believes that “Simplicity is the ultimate sophistication”.
- There are different variations of this principle but it is roughly about when there are multiple solutions to a problem, the simplest one tends to be the best one.
- When designing a product or a website, try to get rid of the unnecessaries as they create clusters and distraction. These make it difficult for your users to reach their goal.

# Pareto Principle

- Pareto Principle, as known as 80/20 rule, is named after an Italian economist Vilfredo Pareto.
- This principle says that 80% of the outcome come from 20% of the cause.
- When this is used in product design, it means that the unused functions or features could be removed due to the fact that they do not contribute to the outcome.
- Get rid of everything that is not essential to making a point.

# **Chapter Ends**

# Chp 2. Heuristic Evaluation

# Usability Heuristics

- Jakob Nielsen described the 10 general principles for interaction design.
- These principles were developed based on years of experience in the field of usability engineering and they've become rules of thumb for human-computer interaction.
- They can help to save development teams considerable amounts of time during early usability testing, so that they can direct their attention to more complex design challenges.
- It's also worth it to use them as a checklist when designing a new product or a feature.

# Heuristic principles

## 10 Usability Heuristics

### **Visibility**

Show system status, tell what's happening

### **Mapping**

Use familiar metaphors & language



### **Freedom**

Provide good defaults & undo

### **Consistency**

Use same interface and language throughout



### **Error Prevention**

Help users avoid making mistakes



### **Recognition**

Make information easy to discover



### **Flexibility**

Make advanced tasks fluid and efficient



### **Minimalism**

Provide only necessary information in an elegant way



### **Error Recovery**

Help users recognize, diagnose and recover from errors



### **Help**

Use proactive and in-place hints to guide users

# #1: Visibility of system status

- The design should always keep users informed about what is going on, through appropriate feedback within a reasonable amount of time.
- When users know the current system status, they learn the outcome of their prior interactions and determine next steps.
- Predictable interactions create trust in the product as well as the brand.
- The sense of control can be evoked by providing information about the system status and feedback after every interaction.
- One example is twitter making a swoosh sound when a tweet is being posted. Another example is Google Drive showing the status of a document upload. etc etc etc.....

AT&T

6:15 PM

68%



My Drive



Uploads



119B99B6-A...CBD632.PNG



Folders

↑ NAME



Final\_Home\_Album

Modified May 28, 2016



Home\_Album

Modified May 26, 2016



Marriage

Modified Jan 14, 2016



PGPEx\_CVs

★ Modified May 22, 2013



1 of 1 uploading...



Take a look at smartphone. Right after the screen lights up, it informs you about its battery, a wifi connection, received messages, missed calls, and much more. Imagine how insecure you would feel if this information were missing. By utilizing signs, icons, and indicators, the system communicates its status and helps user make better, more informed decisions.



## #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.
- Follow real-world conventions, making information appear in a natural and logical order.
- The way you should design depends very much on your specific users. Terms, concepts, icons, and images that seem perfectly clear to you and your colleagues may be unfamiliar or confusing to your users.
- When a design's controls follow real-world conventions and correspond to desired outcomes, it's easier for users to learn and remember how the interface works.

An extreme example is a smart phone design, which transfers all details of real world objects into the software. At the beginning of smartphone adoption, it helped people to learn how to use their new companions through the aesthetics and processes they were familiar with before.



Great examples of real-world matching icons

Neil Patel could very well say “Sign Up” on his landing page. Instead, he chose to say ambitiously — “Yes, I want Neil to teach me how to grow my Business!”. It sets the context and speaks the everyday language.



# #3: User control and freedom

- Users often perform actions by mistake. They need a clearly marked "emergency exit" to leave the unwanted action without having to go through an extended process.
- When it's easy for people to back out of a process or undo an action, it fosters a sense of freedom and confidence. Exits allow users to remain in control of the system and avoid getting stuck and feeling frustrated.
- Support *Undo* and *Redo*. Show a clear way to exit the current interaction, like a [Cancel button](#). Make sure the exit is clearly labeled and discoverable.



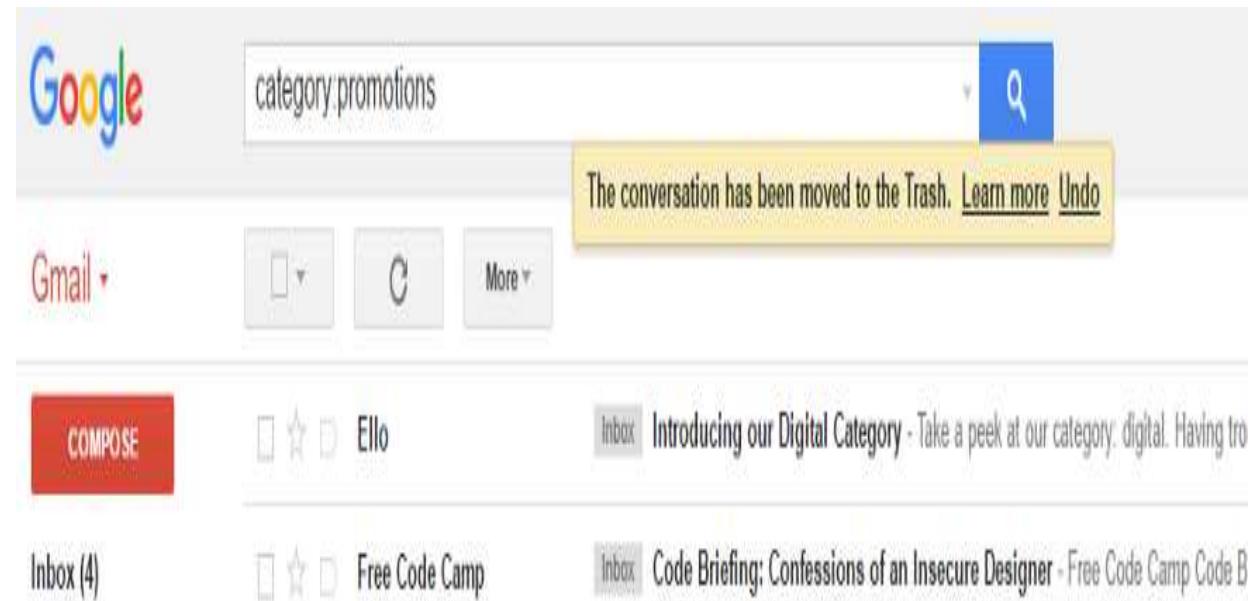
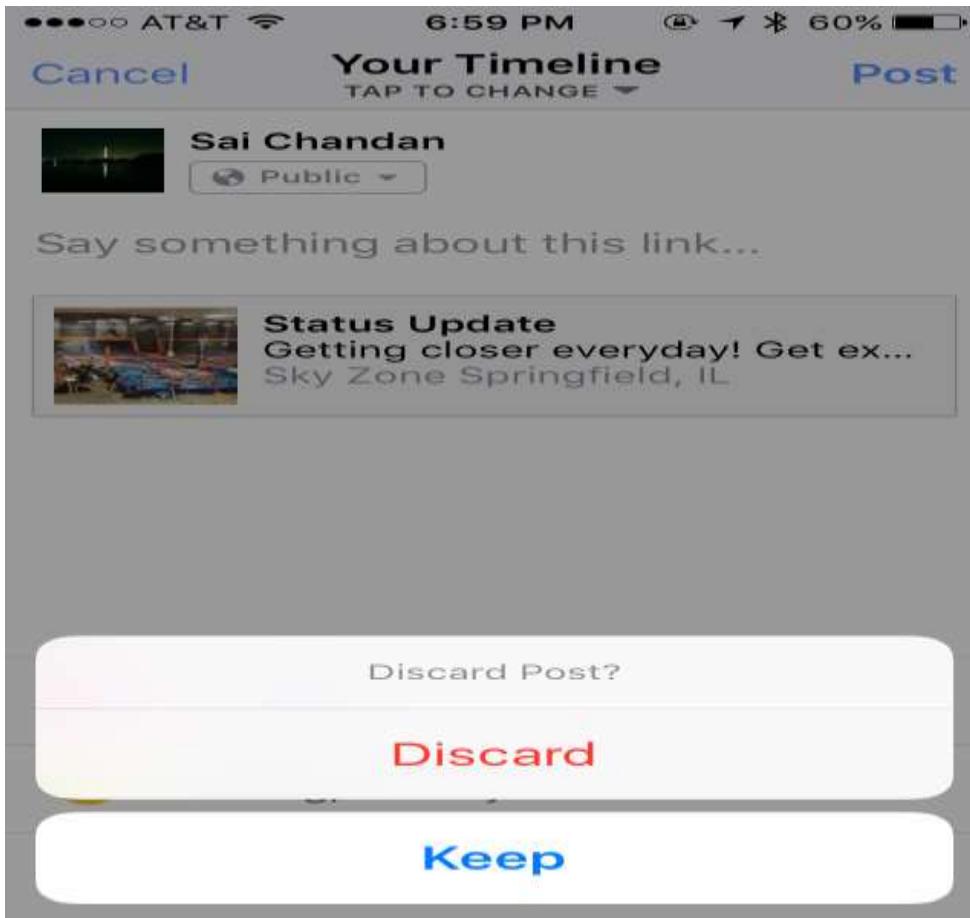
If you attached a large file in Gmail by mistakenly, you can cancel it before its fully uploaded.



An appropriate emergency exit can be something as simple as an arrow back (e.g. in a browser), a trash bin, which protects us from accidental deletion, or the “undo” button, which lets the user to revert the last action. All of these examples demonstrate systems which don’t let users down when they make a mistake, and instead, they allow the user to fix it.



And below is Facebook checking on me if I tapped “Cancel” by mistake. Gmail’s flash message with undo action when we accidentally delete an email.



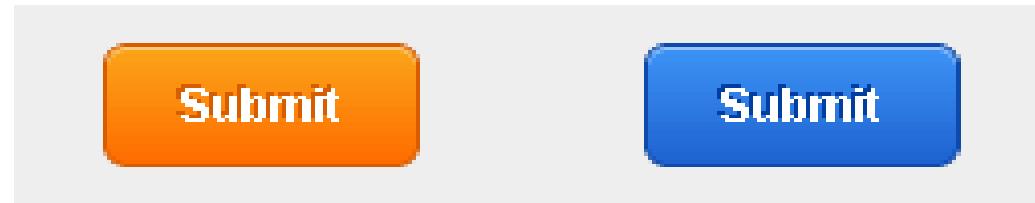
# #4: Consistency and standards

- Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform and industry conventions.
- A comprehensible system should never confuse users by using different words, visuals, or actions for the same concepts.
- Improve learnability by maintaining of consistency

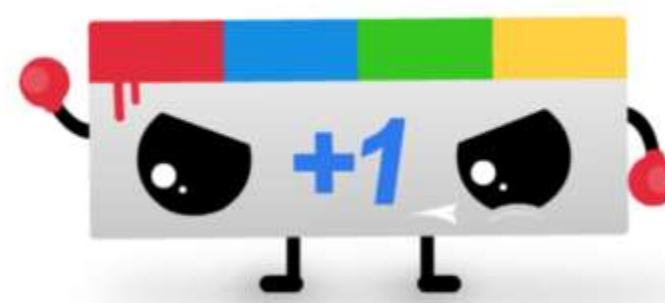


*Check-in counters are usually located at the front of hotels. This consistency meets customers' expectations.*

How the same button can transform across different pages of the same site.  
Note that this is not a change of state.



Google Plus ambitiously launched “+1” to counter Facebook’s “Like” without much success. Facebook’s “Like” already became a standard and sites like LinkedIn adopted it without contesting



# #5: Error prevention

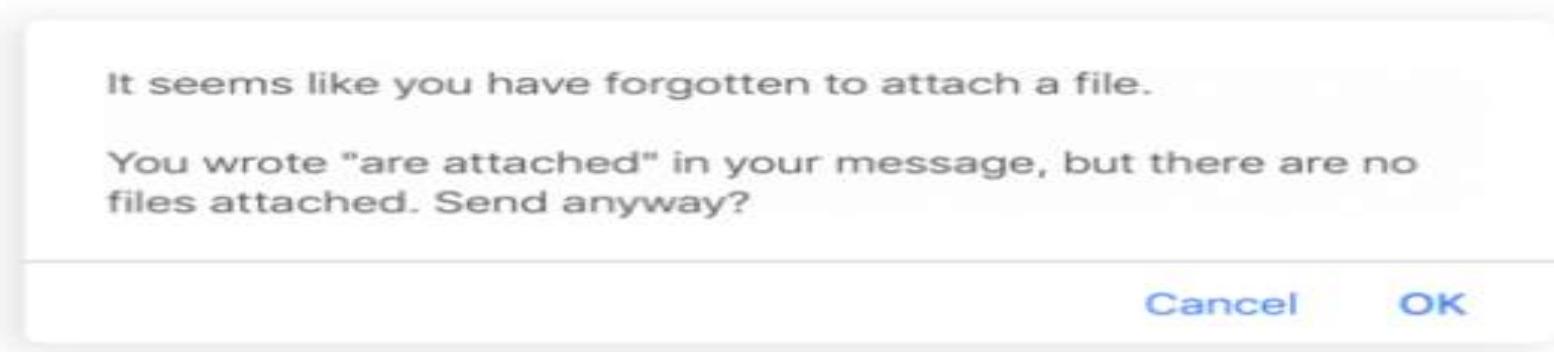
- Good error messages are important, but the best designs carefully prevent problems from occurring in the first place.
- Either eliminate error-prone conditions, or check for them and present users with a confirmation option before they commit to the action.

❖ Google Search trying to correct my spelling:



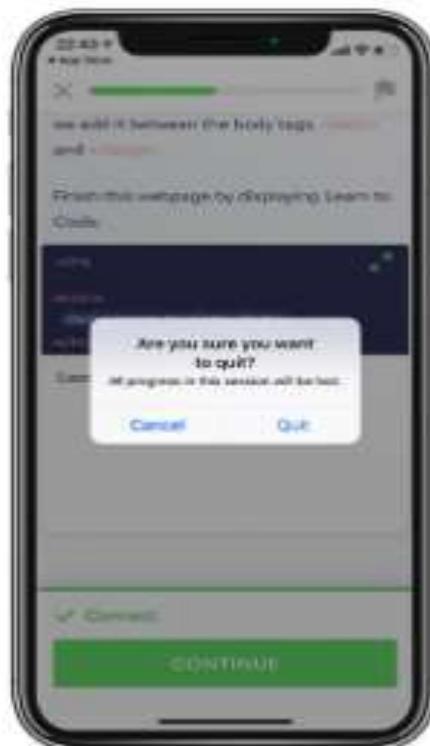
- There are two types of errors: slips and mistakes.
- **Slips** are unconscious errors caused by inattention.
- **Mistakes** are conscious errors based on a mismatch between the user's mental model and the design.

- **Slips** happen when the user tends to do an action, but due to low attention, performs another one (e.g. when performing well known task).
- The strategy to prevent users from experiencing a slip is to minimize the chance of it occurring by guiding them only through the safe areas.

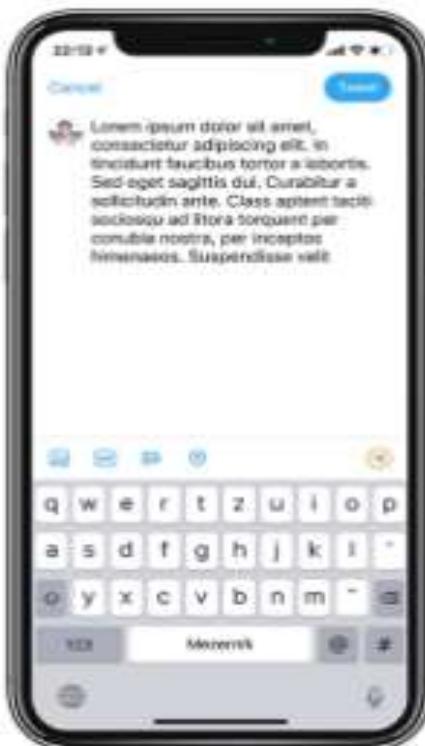


Smart slip prevention in the gmail web app. Unfortunately, the mobile app lacks this feature.

- **Mistakes** are often caused by a user's incorrect mental model of how the system works.
- The user misunderstands the communication and consciously performs an action which leads to a different result than they intended.
- Use clear communication and a consistent design system to prevent mistakes.

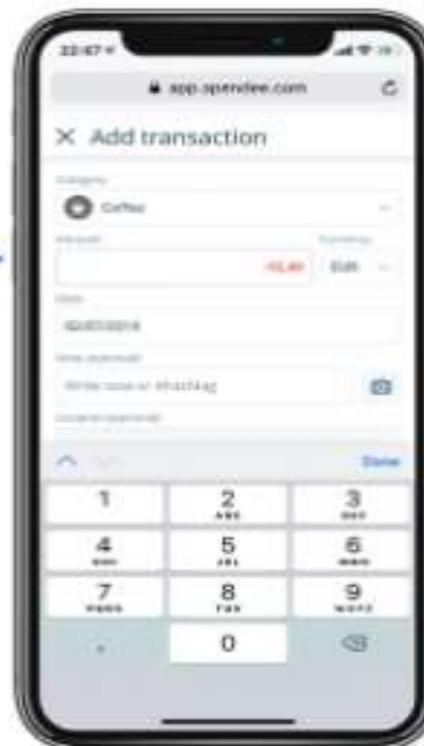


Confirmation dialog before a potentially dangerous operation.



The input doesn't let you write an invalid value.

Subtle information about reaching the character limit.



# #6: Recognition rather than recall

- Minimize the user's memory load by making elements, actions, and options visible.
- The user should not have to remember information from one part of the interface to another.
- Information required to use the design (e.g. field labels or menu items) should be visible or easily retrievable when needed.
- The recognition happens when you easily recognize a person or an object that you're familiar with.
- The recall happens when you have to find rarely used information in your memory (names, years, details, etc.)
- Reduce the information that users have to remember.

➤ Quora suggesting possible questions based on what I am trying to type.

The screenshot shows a Quora search interface. The URL in the address bar is <https://www.quora.com>. The search bar contains the text "good books on". Below the search bar, a dropdown box displays several suggested questions:

- What are some **good books** on marketing?
- What are **good**, accessible **books** on American history?
- I need to get a **good** grasp on SQL, JavaScript, and HTML5 in 3 months. I'm ready to study 8 hours per day. I know basics. I need some **good books** or courses. What are some suggestions?
- What are some **good books** on user interface design?
- What are some **good books** that every entrepreneur should read to better understand and get the know how on the business stuff of startups?

At the bottom of the search bar, there is a red search button with a magnifying glass icon and the placeholder text "Search: good books on".

On the right side of the screen, there is a sidebar for "Update Your Profile" with sections for "Add Topics", "Product Management", "Usability Testing", "Data Visualization", and "Scrum (product)".

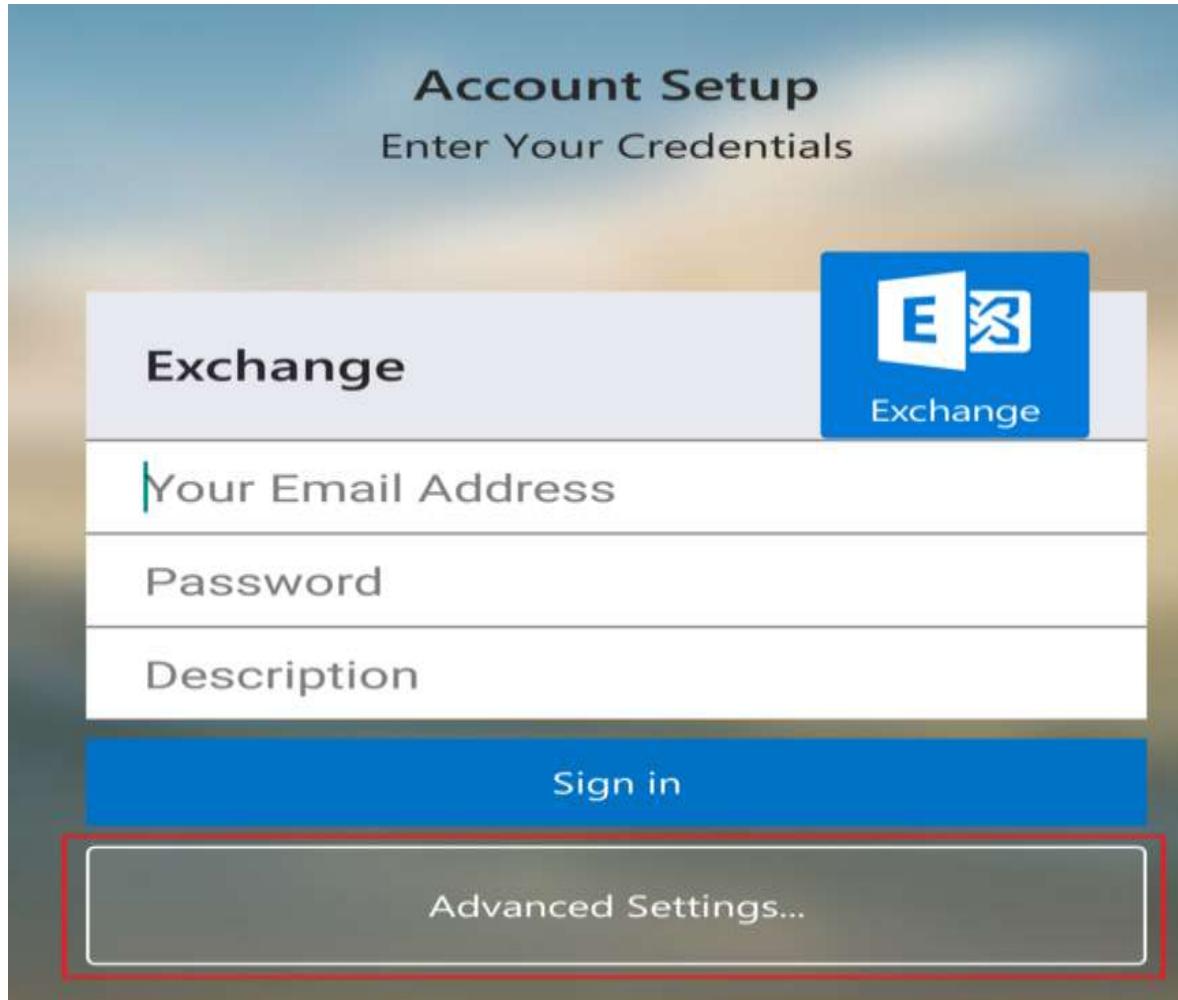


Users who are not familiar with the syntax of terminal commands can't perform as easy operation as opening or deleting the file.

# #7: Flexibility and efficiency of use

- Every user is unique; each have their own different needs and skills. Equally, every task is unique and requires different controllers.
- Shortcuts — hidden from novice users — may speed up the interaction for the expert user such that the design can cater to both inexperienced and experienced users.
- Flexible processes can be carried out in different ways, so that people can pick whichever method works for them.
- A good user interface should offer appropriate functionality to both inexperienced and experienced users.

- An example of setting up Exchange on Android which hides the complex features under Advanced.





NN/g  
WINDICATE.COM

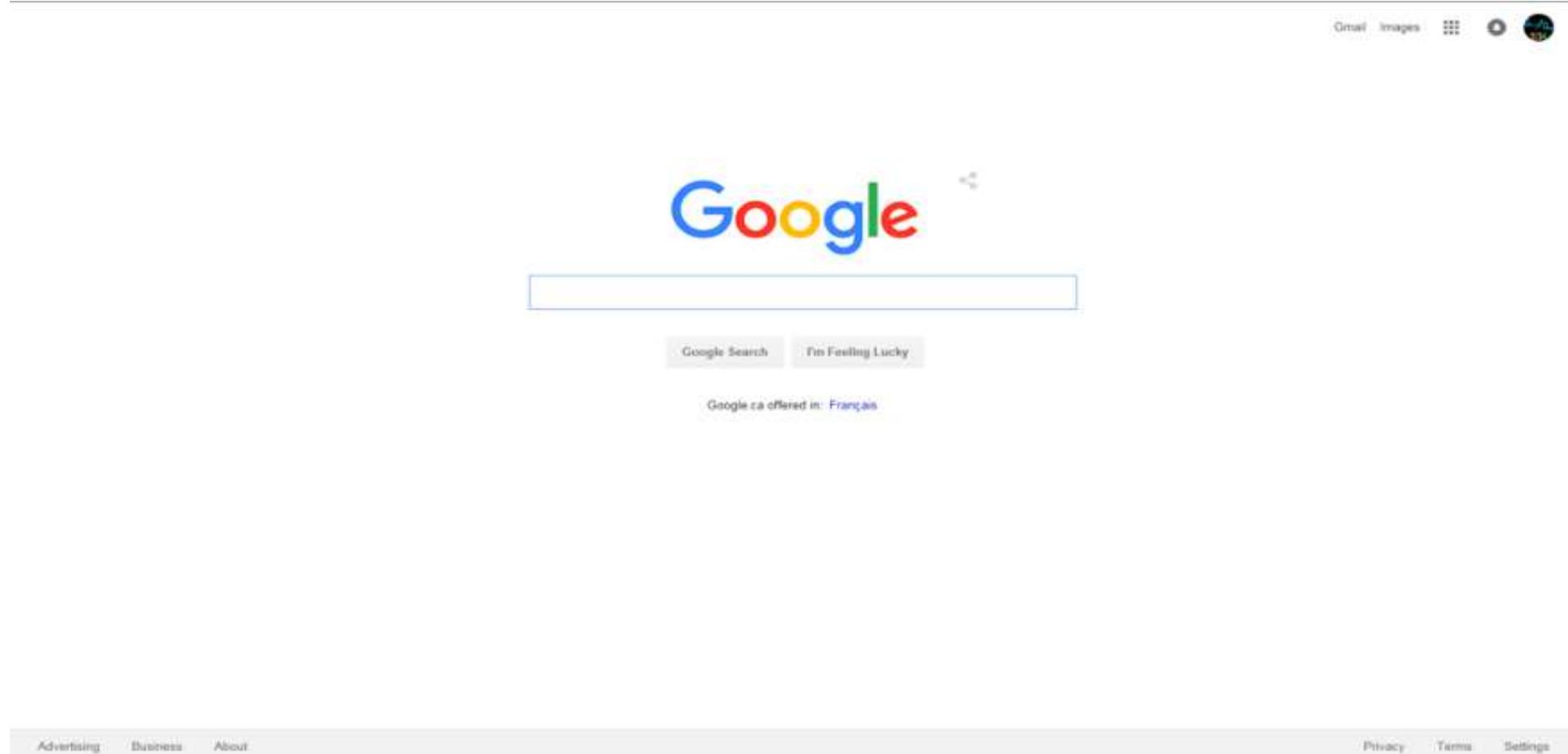
**Example of Usability Heuristic #7:**

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

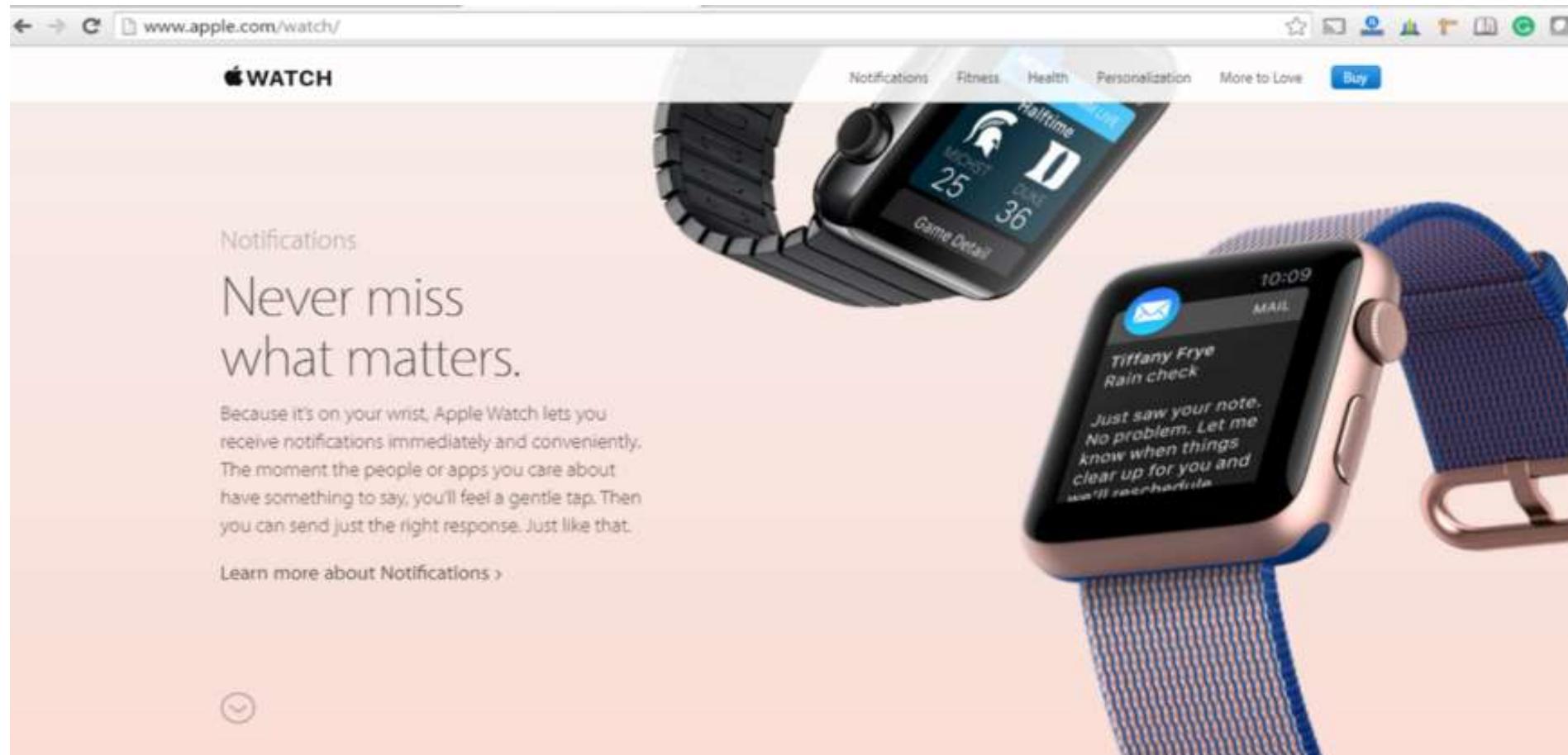
## #8: Aesthetic and minimalist design

- Minimalism aims to reduce the description of a subject just to its necessary elements.
- Minimalism helps users to quickly access important information and come to the result quickly.
- A minimal design uses only the necessary colours/fonts to support the visual hierarchy.
- Keep the content and visual design of UI focused on the essentials.
- Don't let unnecessary elements distract users from the information they really need.

- Google has been resisting the temptation to show more information on their search page for years. This is could be shown as the example of the best possible minimalist design.

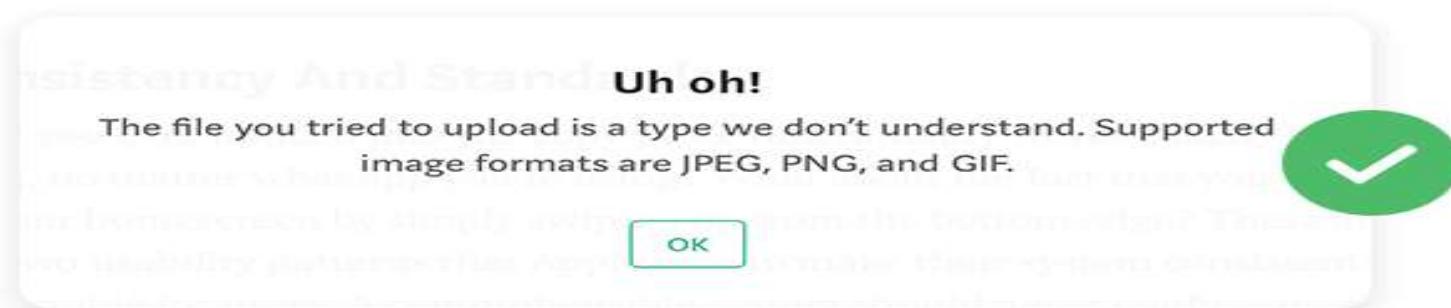


- Apple provides only the basic information of feature hiding additional information under “Learn More”.



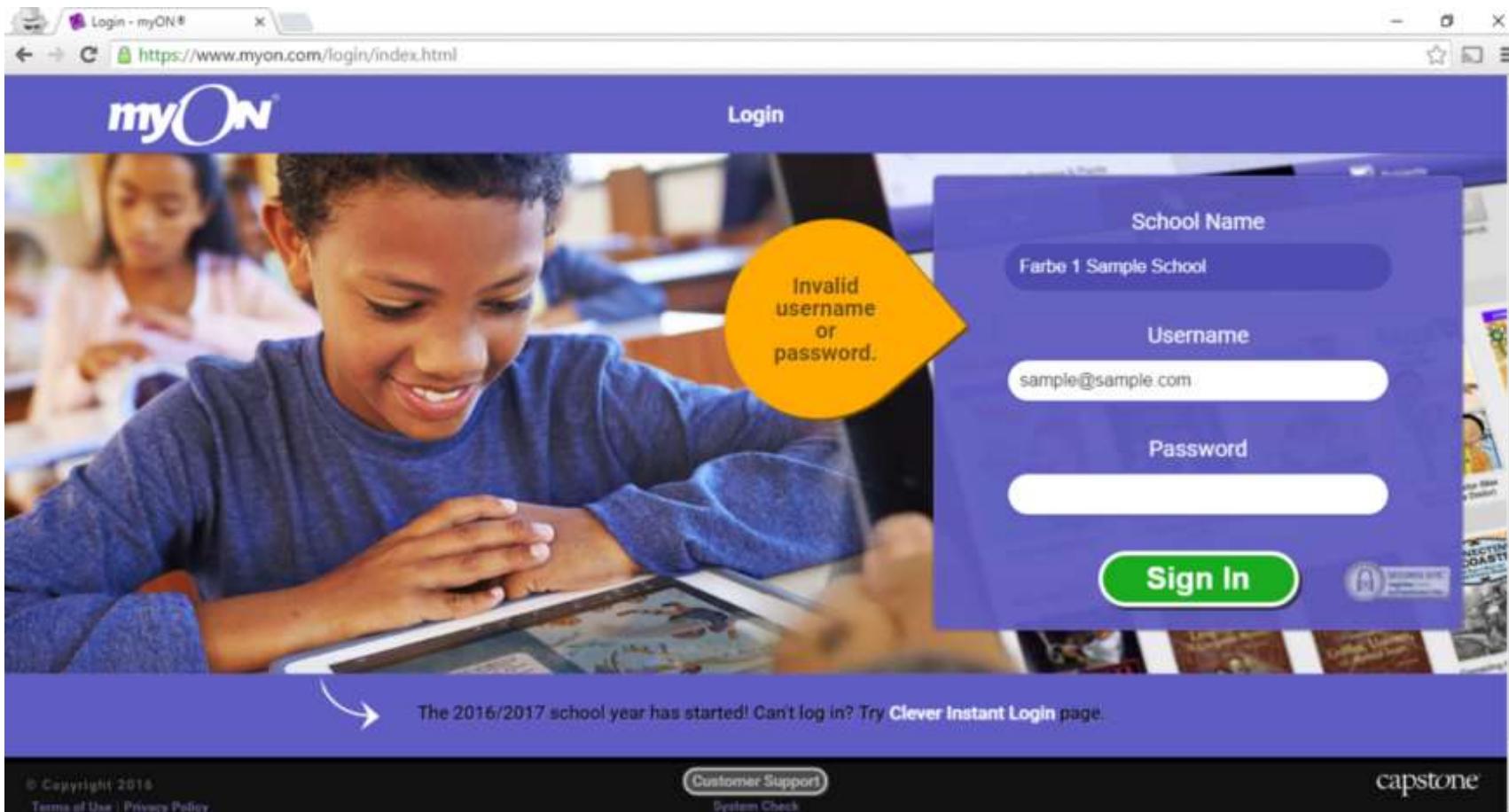
# #9: Help users recognize, diagnose, and recover from errors

- Error messages should be expressed in plain language (no error codes), precisely indicate the problem, and constructively suggest a solution.
- These error messages should also be presented with visual treatments that will help users notice and recognize them.



Great example of the error message which immediately suggests the next steps.

- Here we are not informing the user if the username is invalid or if the password is wrong.



- Instead an example of how MailChimp is handling this scenario:



× Sorry, we couldn't find an account with that username. Can we help you recover your username?

Username [I forgot](#)

Password [I forgot](#)  
 Show

[Log In](#)  Stay logged in

[Create an account](#) · [Trouble logging in?](#)



× Sorry, that password isn't right. We can help you recover your password.

Username [I forgot](#)

Password [I forgot](#)  
 Show

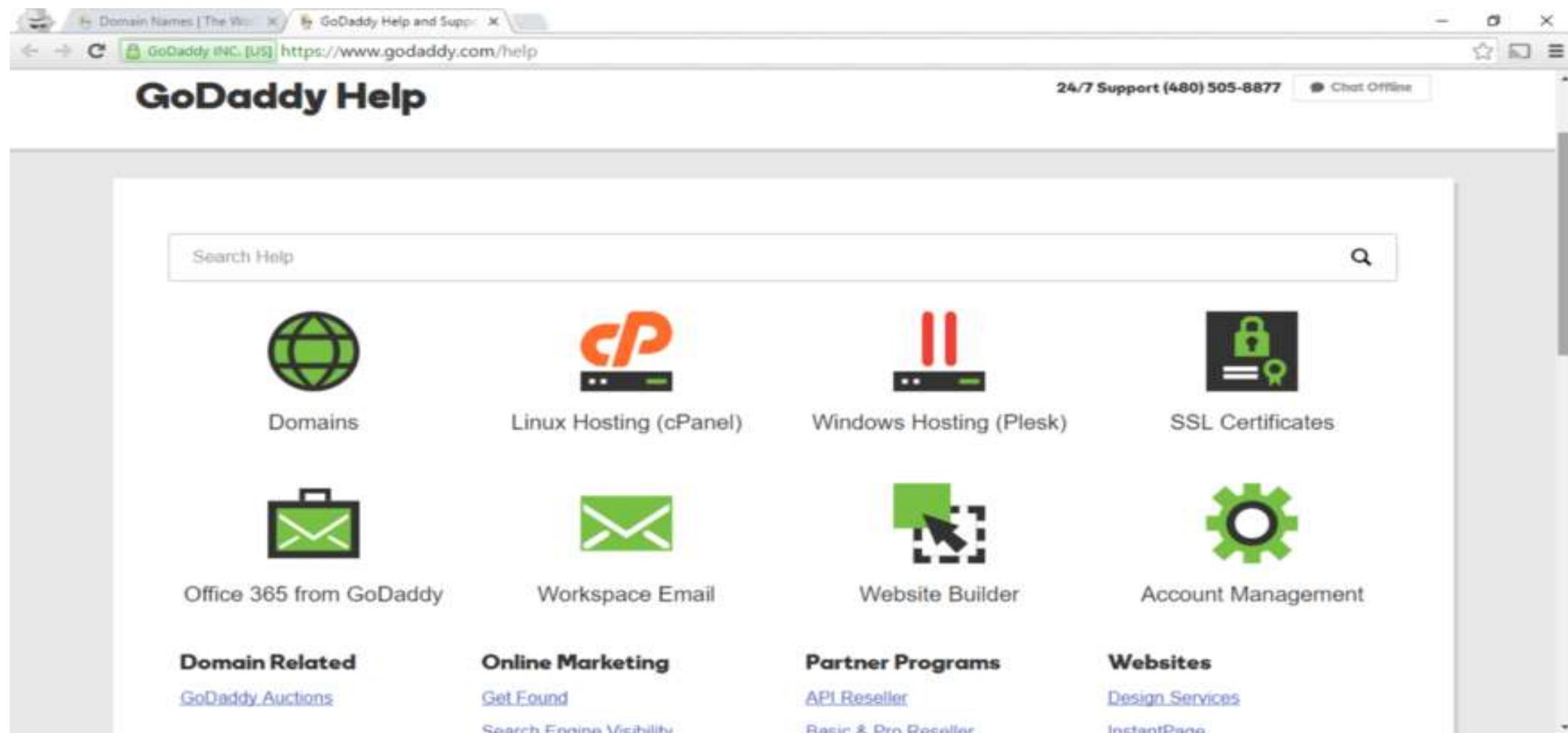
[Log In](#)  Stay logged in

[Create an account](#) · [Trouble logging in?](#)

# #10: Help and documentation

- It's best if the system doesn't need any additional explanation. However, it may be necessary to provide documentation to help users understand how to complete their tasks.
- Help and documentation content should be easy to search and focused on the user's task.
- Keep it concise, and list concrete steps that need to be carried out.

- An example of GoDaddy's Help page. While there is a search field, there are main categories and frequently asked queries on the same page.



The screenshot shows the GoDaddy Help page with a search bar at the top. Below the search bar are eight service icons arranged in a 2x4 grid. The services are: Domains (green globe icon), Linux Hosting (cPanel) (orange 'cp' icon), Windows Hosting (Plesk) (server icon with red 'II' symbol), SSL Certificates (lock icon with green checkmark), Office 365 from GoDaddy (briefcase icon with envelope), Workspace Email (envelope icon with 'X'), Website Builder (green square with cursor), and Account Management (green gear icon). At the bottom, there are four sections: Domain Related (GoDaddy Auctions), Online Marketing (Get Found, Search Engine Visibility), Partner Programs (API Reseller, Reseller & Pro Reseller), and Websites (Design Services, InstantPanels).

GoDaddy Help

24/7 Support (480) 505-8877 Chat Offline

Search Help

Domains

Linux Hosting (cPanel)

Windows Hosting (Plesk)

SSL Certificates

Office 365 from GoDaddy

Workspace Email

Website Builder

Account Management

**Domain Related**

[GoDaddy Auctions](#)

**Online Marketing**

[Get Found](#)

[Search Engine Visibility](#)

**Partner Programs**

[API Reseller](#)

[Reseller & Pro Reseller](#)

**Websites**

[Design Services](#)

[InstantPanels](#)

- These guidelines are general rules of thumb and will mostly be applicable to any web & mobile applications.
- Always use your judgment to implement these principles or any other UX practices by keeping yourself in end user's shoes.

# Heuristic Evaluation

- A Heuristic Evaluation is a usability inspection technique where one or a number of usability experts evaluate the user interface of a product .
- Independent walkthroughs are conducted and issues are reported.
- Evaluators use established heuristics principles and reveal insights that can help design teams to enhance product usability from early in development.
- Heuristic evaluation is a usability engineering method for finding usability problems in a user interface design, thereby making them addressable and solvable as part of an iterative design process.
- Such processes help prevent product failure post-release.
- It is usually conducted by a group of experts because it is very likely that one person will not be able to find all usability problems , analyze an interface from different angles and as a result are more likely to identify a wider set of areas for improvement.

To conduct a heuristic evaluation following steps are conducted:

- **Know what to test and how** – Whether it's the entire product or one procedure, clearly define the parameters of what to test and the objective.
- **Know your users and have clear definitions of the target audience's goals, contexts, etc.** User personas can help evaluators see things from the users' perspectives.
- **Select 3–5 evaluators**, ensuring their expertise in usability *and* the relevant industry.
- **Define the heuristics** (around 5–10) – This will depend on the nature of the system/product design.
- **Brief evaluators on what to cover in a selection of tasks**, suggesting a scale of severity codes (e.g., critical) to flag issues.
- **1st Walkthrough** – Have evaluators use the product freely so they can **identify** elements to analyze.
- **2nd Walkthrough** – Evaluators **scrutinize** individual elements according to the heuristics. They also examine how these fit into the overall design, clearly **recording** all issues encountered.
- **Debrief evaluators** in a session so they can collate results for analysis and suggest fixes.

## 1) Know what to test and how –

Whether it's the entire product or one procedure, clearly define the parameters of what to test and the objective.

### ➤ Define the scope of your evaluation.

- The first thing you should define the scope of your evaluation in keeping with your budget and deadline.
- Do you need to test every aspect of your product or should you concentrate on particular user-flows?
- Do you need to identify major issues in a small time frame?

### ➤ Specific usability parameters(scope) that you want to test for your product, such as:

- Registration
- Login/out
- Email signup
- Navigation
- Shopping cart
- Checkout

➤ Having a limited scope is easier to control and assess.

## 2) Know your users:

Understanding who your end-user is and what their goals are will aid the usability evaluation.

- This is an important part of mapping out the user flow, as different user groups have distinct expectations and user behaviors.
- *For instance:*
  - ❑ Some users might not have issues registering for a product while others may see it as an unnecessary step and abandon a product.
  - ❑ User motivation depends on various factors, including:
    - Demographics
    - Personal preferences
    - Skillsets
    - and more
- Know your end-user, and create advanced user personas to assist evaluators during the evaluation process.

### 3) Select 3–5 evaluators

- Ensuring their expertise in usability *and* the relevant industry.
- It is very likely that one person will not be able to find all usability problems. On the other hand, a group of different people tend to analyze an interface from different angles and as a result are more likely to identify a wider set of areas for improvement.

#### **4) Choose your set of heuristics.**

- Select which heuristics the evaluators are going to use.
- This will ensure that they are all using the same guidelines throughout the evaluation. We mentioned a few of the most popular heuristics earlier, so check them out.
- Without heuristics, the usability evaluation will produce unreliable, inconsistent, and ultimately, useless results. Essentially, all your efforts will be for nothing.

## 5) Set up an evaluation system and identify issues

- Decide how evaluators will evaluate and report the usability of your product.
- Try setting up a simple evaluation system using a severity rating:
  - Critical issue
  - Normal issue
  - Minor issue
  - Good practice
- Whichever evaluation system you choose, discuss it with evaluators beforehand to make sure everyone is on the same track.
- Evaluators should keep track of issues by making detailed notes of where they encountered the issue and how serious it is. This will help organize the design team's backlog later on.

## 6) Analyse and summarize findings

- As the evaluation draws to a close, it's time to gather, compare, and summarize the findings.
- One of the key benefits of using multiple evaluators is that they will each find issues that their counterparts have missed.
- Start by removing duplicates and organizing the data consistent with the severity rating of each issue. This will facilitate the design team in prioritizing their workflows.
- The findings will become the launch pad for improved UX design and an all-around better product.

# Severity Ratings

- Severity ratings can be used to allocate the resources to fix the most serious problems and can also provide a rough estimate of the need for additional usability efforts.
- If the severity ratings indicate that several disastrous usability problems remain in an interface, it will probably be unadvisable to release it. But one might decide to go ahead with the release of a system with several usability problems if they are all judged as being cosmetic in nature
- The severity of a usability problem is a combination of three factors:
  - ❑ The **frequency** with which the problem occurs: Is it common or rare?
  - ❑ The **impact** of the problem if it occurs: Will it be easy or difficult for the users to overcome?
  - ❑ The **persistence** of the problem: Is it a one-time problem that users can overcome once they know about it or will users repeatedly be bothered by the problem?

The following 0 to 4 rating scale can be used to rate the severity of usability problems:

**0** = I don't agree that this is a usability problem at all

**1** = Cosmetic problem only: need not be fixed unless extra time is available on project

**2** = Minor usability problem: fixing this should be given low priority

**3** = Major usability problem: important to fix, so should be given high priority

**4** = Usability catastrophe: imperative to fix this before product can be released

# UNIT 3

# USABILITY FOCUSED PROJECT DEVELOPMENT

# Redesigning App/Website using design lifecycle

<https://blogs.zeiss.com/digital-innovation/en/usability-in-software-development-projects/>

There are series of steps that can make the redesign experience less painful and more likely to result in a positive outcome for both the user and the business.

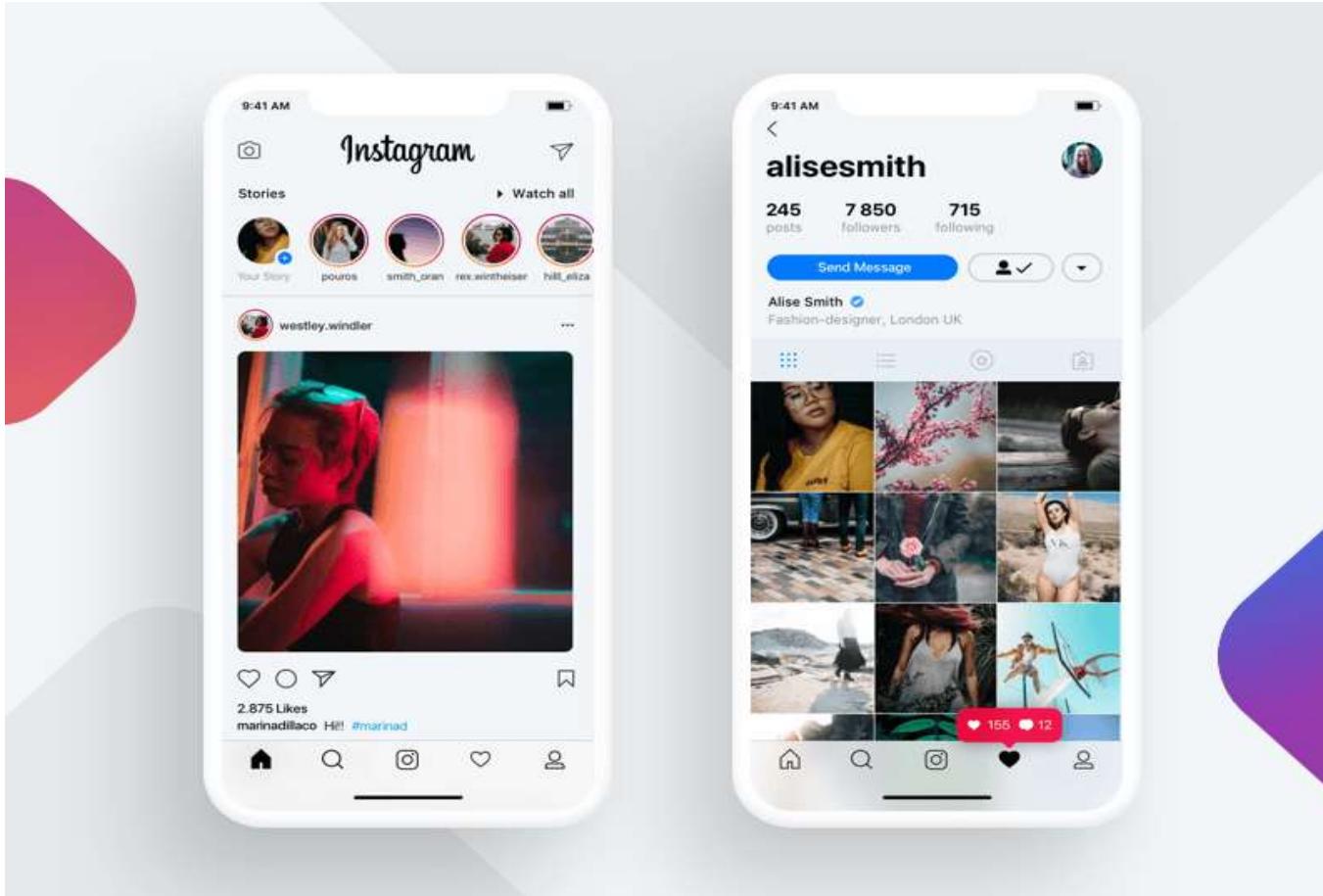
Step by step process:

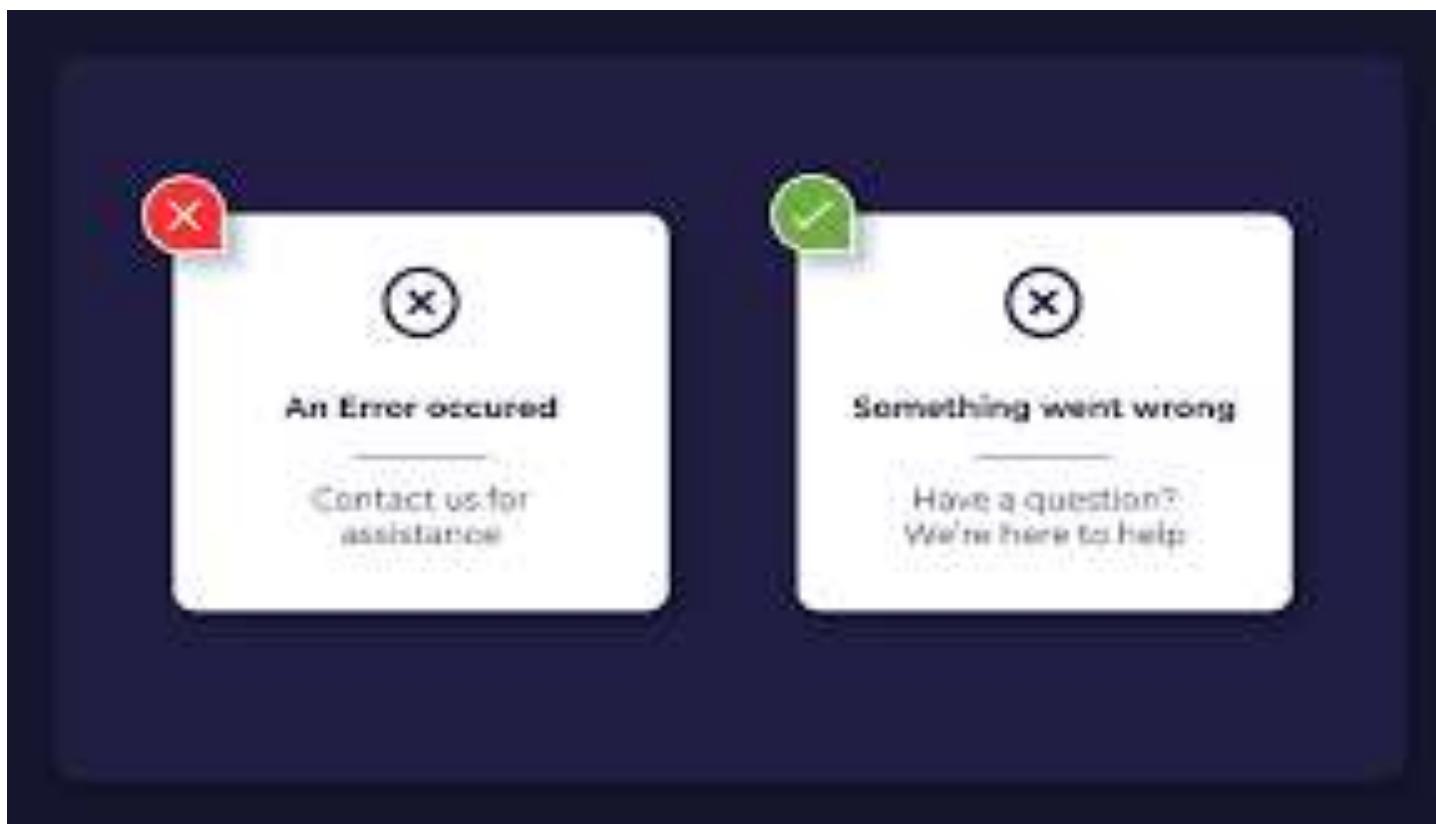
1. Understand initial goals of redesigning
2. Communicate with users to gain insights
3. Evaluate customer reviews and feedback
4. Implement changes and user experience
5. Test redesign with users
6. Monitor and maintaining

# 1. Understand initial goals of redesigning

- Is it time to redesign because user experience trends have changed?
- Is it time to redesign because you launched a new feature?
- Is it time to redesign because the competition is providing a better app experience?







## Step 2: Communicate With Users To Gain Insight

- One of the most underestimated steps in the redesign process is communication.
- At this stage, you already know exactly what you want to accomplish with your app redesign.
- Now you have to communicate the impending change to people who love and frequently use your website/app.
- Once you've communicated this, you can meaningfully engage your users and learn what they do and don't like about the current experience or what they'd like to see changed.

# CUSTOMER COMMUNICATION 101



# Insights template

---

## What happened

(Observation + source of information)

Clients complain about price inconsistency "the price shown on the app is different from the price charged"  
(Source: appstore)

## What does it mean

(Business impact)

Users uninstall the app, leave low ratings and bad reviews in appstore.

**In terms of metrics: increased churn, increased uninstalls. Low ratings and reviews have negative effect on download intent and branding.**

## What can we do

(Proposed solution)

## Expected benefit

(Expected outcome, metrics)

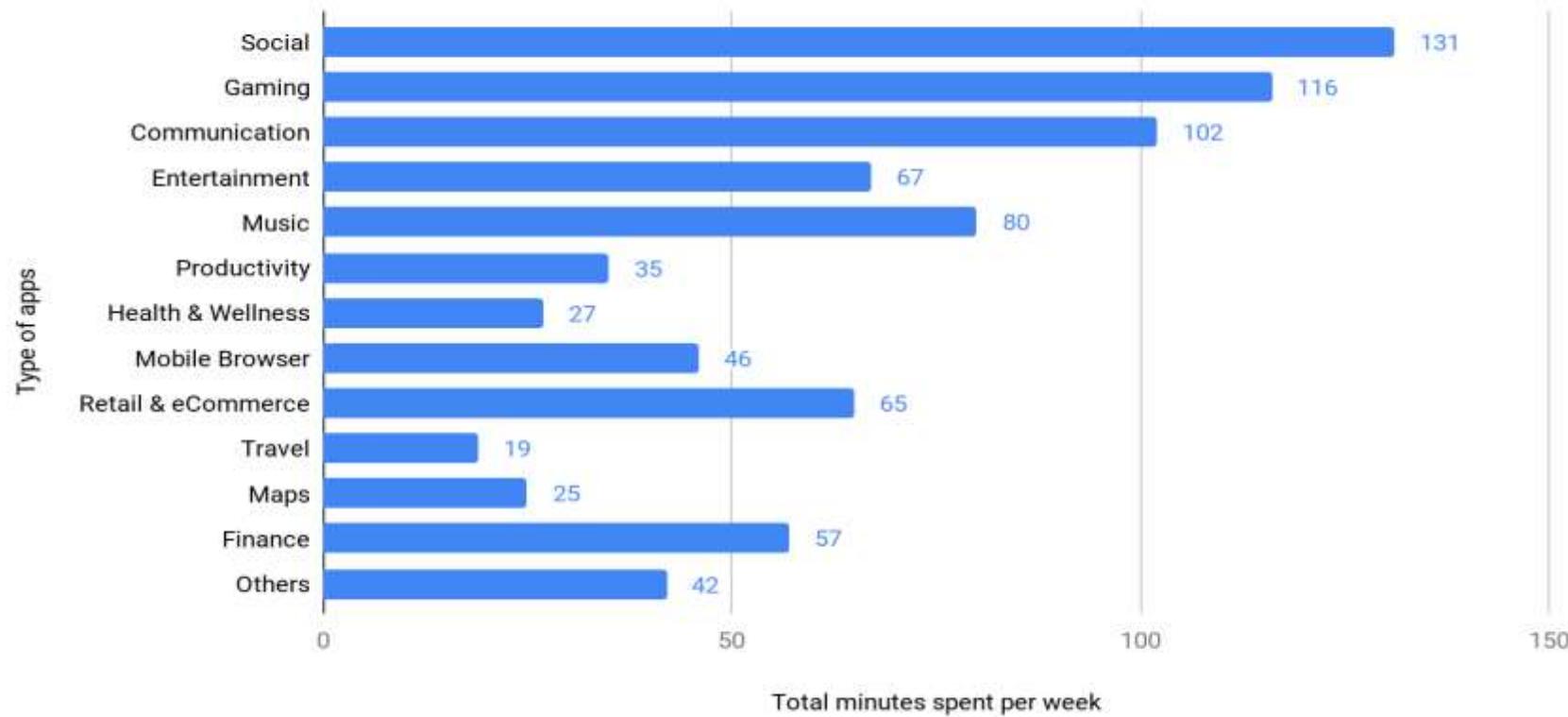


CC BY-SA 4.0 / Sol Mesz / [www.solmesz.com](http://www.solmesz.com)

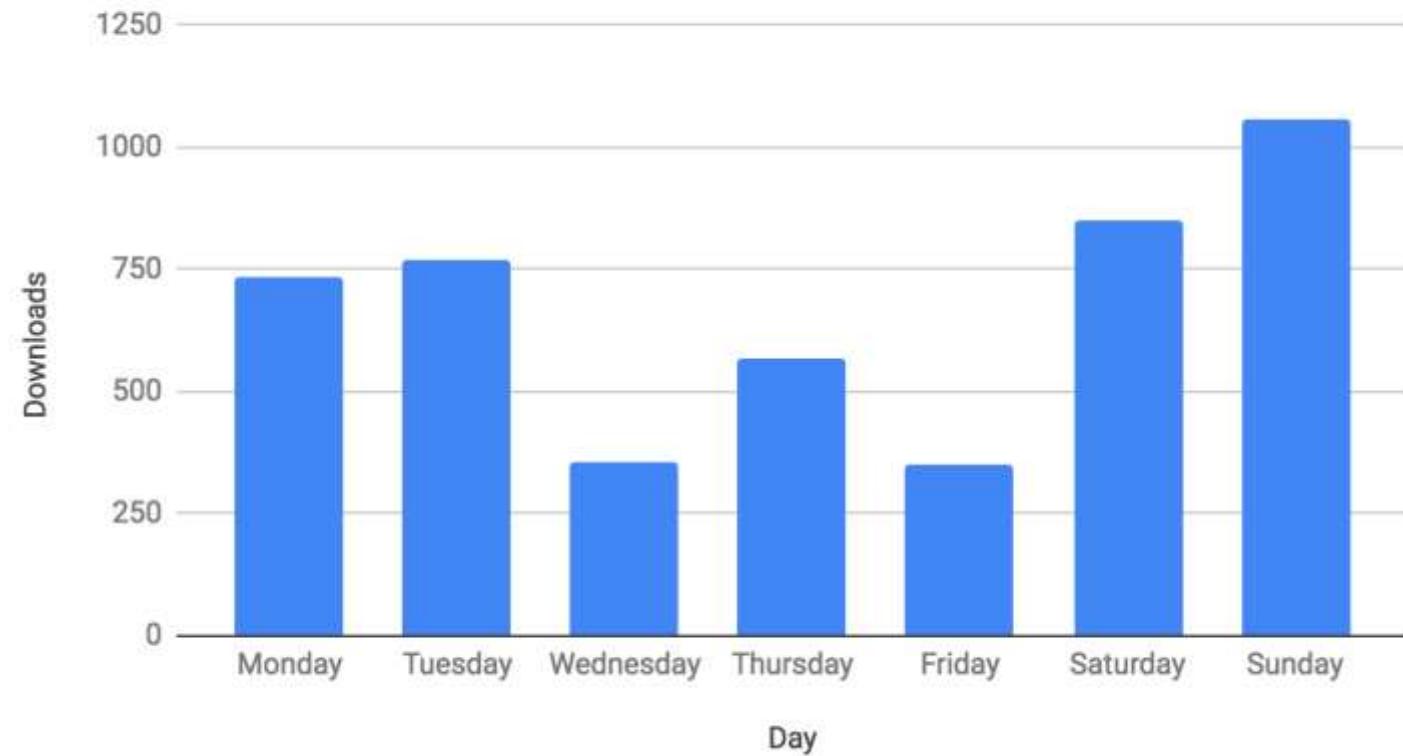
## Step 3: Evaluate Customer Reviews & Feedback

- If your app has been in the hands of real people for a few months, it's likely that you have data.
- Some of this data will be quantitative (e.g., stats on in-app usage and engagement) while some will be qualitative (e.g., reviews and messages).
- Compile all this data and look for trends.
- Do you notice that lots of users are complaining about a specific feature? Are users asking how to update a specific element of their account? Are users tapping a specific button when they're trying to select something else?

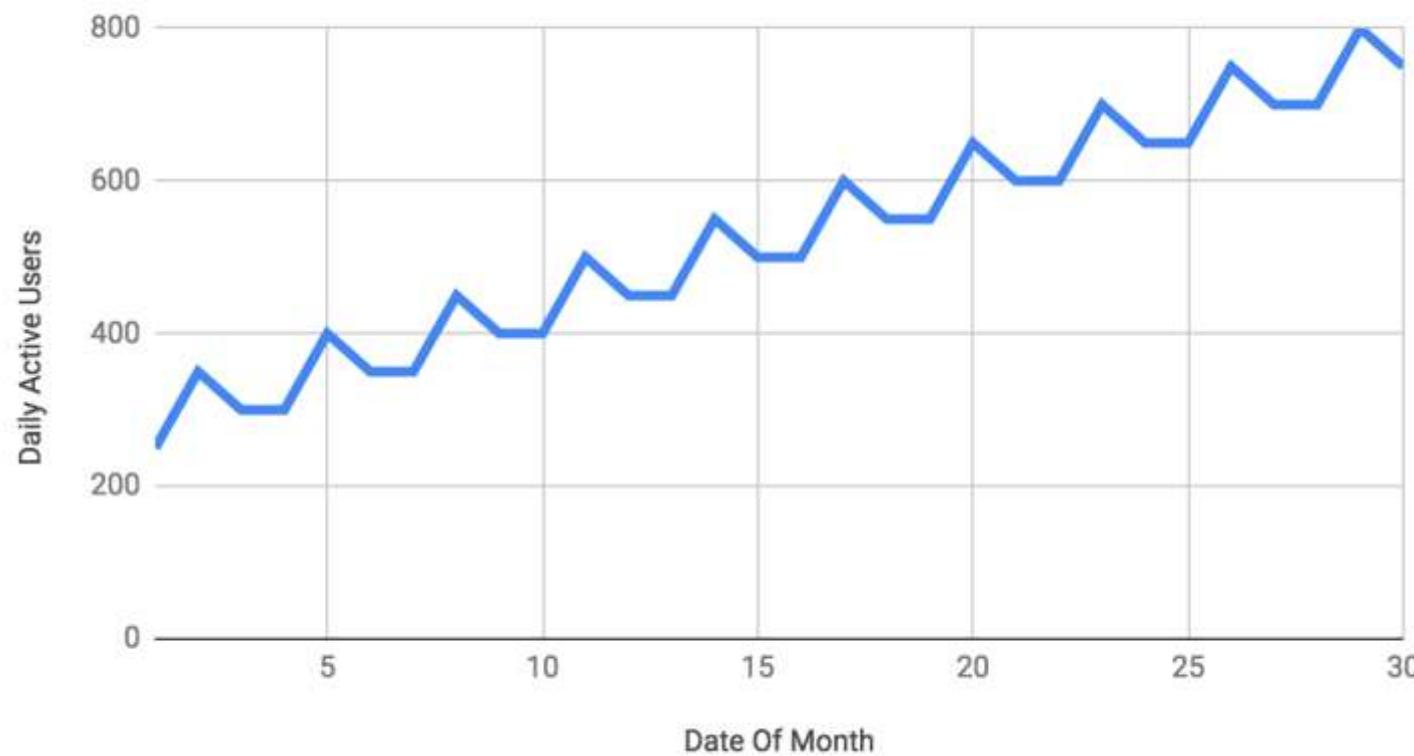
### Average weekly time spent in-app



## Downloads vs. Day



## Daily Active Users vs. Date Of Month



◀ Apps



## Afterlight — Photo Editor

Filter. Texture. Create.

GET

In-App Purchases



4.7, 4.5K Ratings



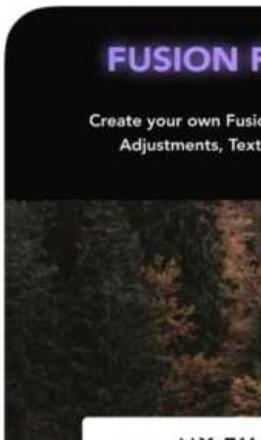
Editors' Choice

#118

Apps Photo & Video

4+

Age



## Ratings & Reviews

See All

4.7

out of 5



4.508 Ratings

great, but could be better



Jun 3

angelina:)))

this app overall is amazing. most editing apps was disgusting destructive filters that looks horrible, but afterlight's are actually pretty good. the interface is really easy to use, and is very user-friendly. this is a great app for both beginners and advanced editors. definitely recommend.

more



Editing photos doesn't have to require laborious tinkering; Afterlight transforms them in an instant. It delivers powerful tools for adjust

more



**ustwogames**  
@ustwogames

 Follow

Seems quite a few people have gone back and 1 star reviewed Monument Valley upon update because the expansion was paid. This makes us sad.

10:01 PM - 12 Nov 2014

1,484 RETWEETS 556 FAVORITES



**ustwogames**  
@ustwogames

 Follow

That's it, we're giving up the premium game. Next time we're just going to sell you 500 coins for \$2 instead.

10:06 PM - 12 Nov 2014

624 RETWEETS 591 FAVORITES





**Meh so far!**

First off, developer should put all text in BLACK - not a light brown color which has small type and color makes it hard to read. Second - your first beverage is NOT free!

Misleading!! You start an account then you bring it to a Peets store, they scan your app, you get no credit or free beverage till second time you use app. Now, you know!

# Step 4: Implement Changes To The Look & The User Experience

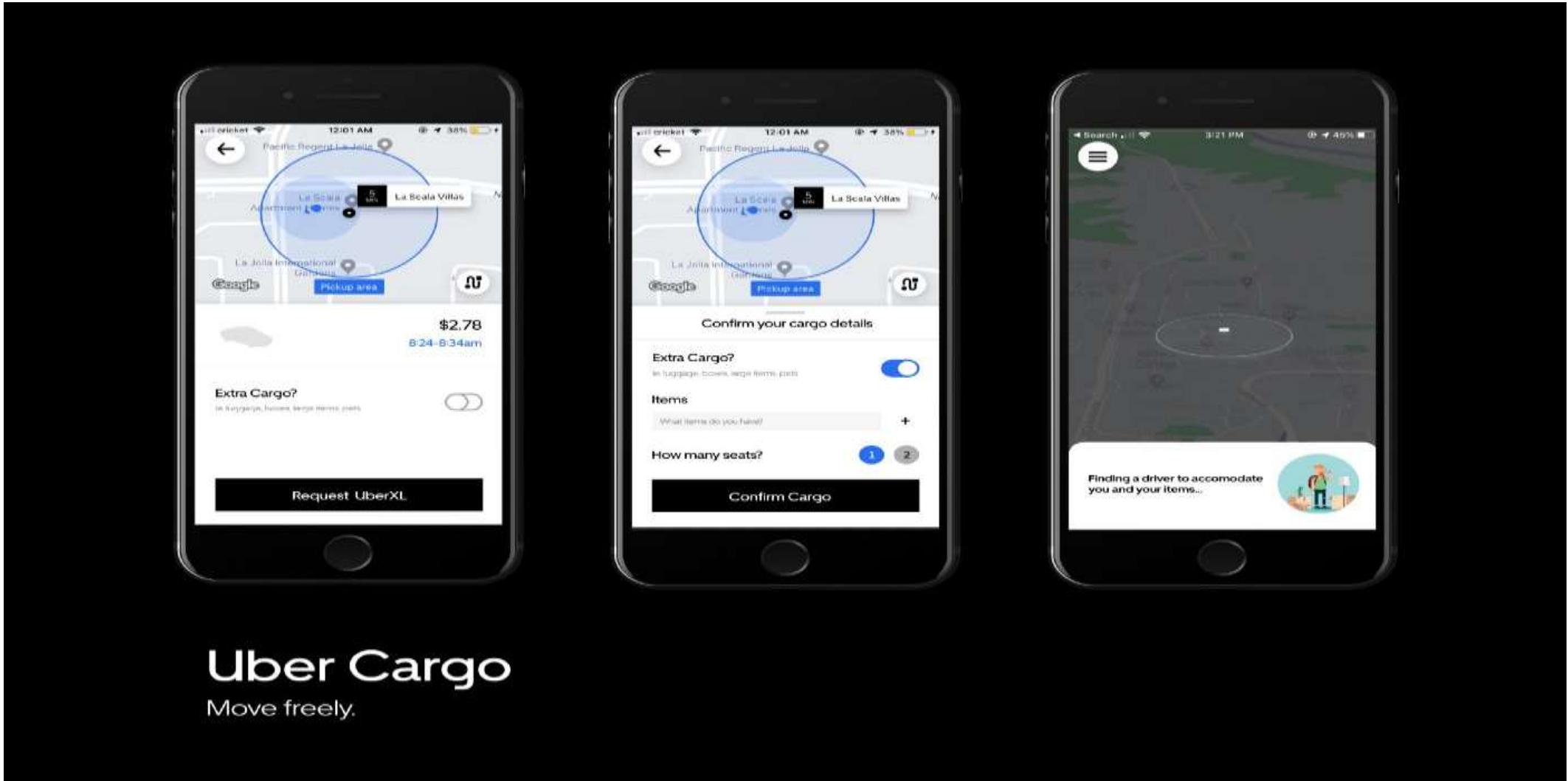
- As per the quantitative and qualitative data collected ,an analysis is carried out for the essential changes that need to be redesigned in the application.
- Make appropriate decisions to implement the necessary changes in stages.



# Step 5: Monitor Usage & User Response Upon Launch

- To find out if the redesign was successful, look back at the goal you set out when you first started this project and gauge whether you achieved it.
- Did usage increase? Did engagement increase? Are there more positive reviews in the app store than there were before? Are you seeing a spike in growth?
- That's where you need to focus your attention now. Use your data and feedback as a starting point to not only gauge whether the redesign was a success but also to uncover opportunities to iterate and improve.

# Uber underwent their most recent redesign



# Case study 1-UBER

<https://medium.com/@katyanoble/uber-redesign-case-study-44349274da2a>

# Case Study 2 -GXpress

<https://uxplanet.org/gxpress-website-redesign-ux-case-study-56dbbd067824>

# Usability Testing

Usability testing refers to evaluating a product or service by testing it with representative users.

Typically, during a test, participants will try to complete typical tasks while observers watch, listen and takes notes.

The goal is to identify any usability problems, collect qualitative and quantitative data and determine the participant's satisfaction with the product.

The goal of this testing is to satisfy users and it mainly concentrates on the following parameters of a system:

- **The effectiveness of the system**

- Is the system is easy to learn?
- Is the system useful and adds value to the target audience?
- Are Content, Color, Icons, Images used are aesthetically pleasing?

- **Efficiency**

- Little navigation should be required to reach the desired screen or webpage, and scrollbars should be used infrequently.
- Uniformity in the **format** of screen/pages in your application/website.
- Option to search within your software application or website.

- **Accuracy**

- No outdated or incorrect data like contact information/address should be present.
- No broken links should be present.

- **User Friendliness**

- Controls used should be self-explanatory and must not require training to operate
- Help should be provided for the users to understand the application/website
- Alignment with the above goals helps in effective usability testing

## Benefits of Usability Testing

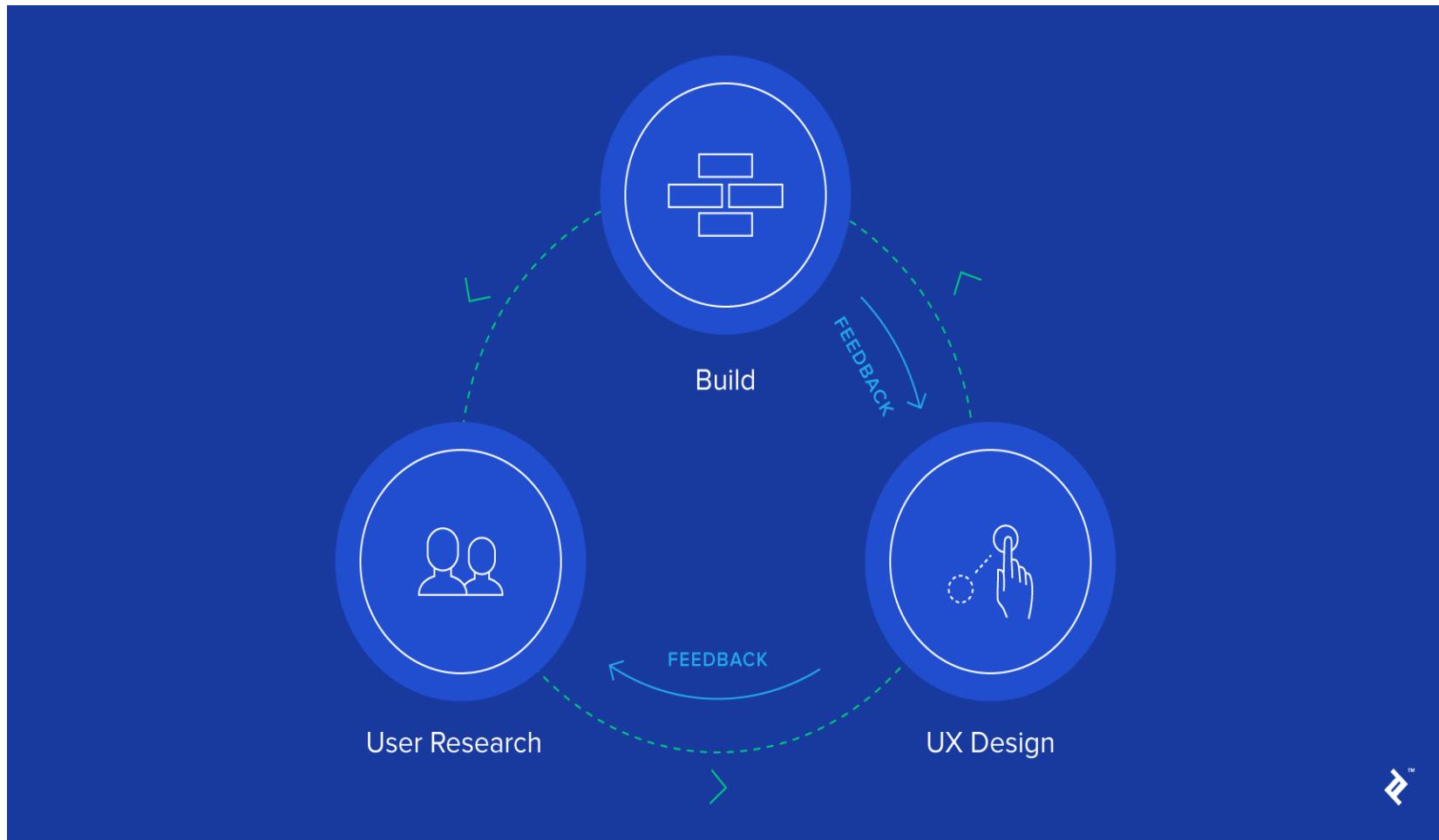
- Usability testing lets the design and development teams identify problems before hand.
- The earlier issues are identified and fixed, the less expensive the fixes will be in terms of both staff time and possible impact to the schedule. During a usability test, you will:
- Learn if participants are able to complete specified tasks successfully and
- Identify how long it takes to complete specified tasks
- Find out how satisfied participants are with your Web site or other product
- Identify changes required to improve user performance and satisfaction
- And analyze the performance to see if it meets your usability objectives

# Chapter 4

# USER RESEARCH

# User Research

- User research is **the methodic study of target users—including their needs and pain points**—so designers have the sharpest possible insights to work with to make the best designs.
- User researchers use various methods to expose problems and design opportunities, and find crucial information to use in their design process.
- Examples include **user interviews, field studies, usability testing, and customer calls**.
- It's important to use a mixture of both quantitative and qualitative methods to come to a holistic understanding of the user and problems to be solved.



# Understanding Your User

- In order for website and applications to be successful, designers and developers should start with understanding its **intended audience**.
- The product should be optimized around helping users complete their tasks as easily as possible.
- **Time invested in discovering end user goals**, needs, and tasks both ensures that end products will deliver value and **mitigates many risks**, including making sure that features are prioritized and built correctly.

# Understanding Users

- Understanding as much of the **context** as possible gives you the best chance of meeting users' needs in a simple and cost effective way.
- Focus **on the user and the problem** they're trying to solve, **not a particular solution**.
- **Test** your assumptions early so you can reduce the risk of building the wrong thing.
- Perform **user research and analysis** to understand what users need building quick and then throwaway **prototypes** to test the hypotheses.

# What Are User Goals?

- User Goals are **descriptions of end states** that users want to reach.
- Mapping a user's journey toward meeting their goal, including steps taken before and after using a website or application, can be helpful to generate insight.
- A website that makes all of its content findable and all of its interactions intuitive may be usable, but it won't be useful unless it is relevant to an actual goal a user has.
- Designers and site owners should understand user goals before any design or development occurs.
- One of the most substantial risks to a development project is building the wrong product and only understanding user goals mitigates that risk.

# Eliciting User Goals

- A variety of methods exist for eliciting user goals, each with strengths or drawbacks.
- Asking project stakeholders (people who are not end users but who nevertheless have invested in the project's success) is not an optimal way of finding user goals.
- Stakeholders — even ones that interact with users directly — often have goals that are different from and even in tension with users.
- Stakeholders' perspective are important for the project, but they should not be considered a definitive source of user goals.
- Asking users themselves, such as through **user interviews, focus groups, or surveys**, can be a better way of discovering.

# Context of use

- Context of use focuses on **where, when, how and why users are performing a task, reaching a goal or using your product or service.**
- The Context of Use is the **actual conditions** under which a given artifact/software product is used, or will be used in a normal day to day working situation.
- It is important to carry out **walkthroughs, usability tests, prototyping sessions, meetings, user studies in the context of use** to get as high validity of your findings as possible.

# Context of use

- Context holds the key to **differentiated user experience**.
- Context frames all experience.
- If you didn't understand the user will be using your app mostly on mobile, but designed for desktop, ease of use wouldn't save you.
- Context sets the expectation, spoken and unspoken for user interaction....It is basically the where and how you take your **user to the feature or touchpoints**.
- To understand the context we can conduct: **Contextual Interview**

# Few real examples to illustrate context of use

- At a medical billing office, we observed stacks of bills on a user's desk. "I want these digitized or on an iPad...I want to see which ones I have done and then keep a copy for auditing purposes".
- For a mobile app aimed at students, users wanted a secret or parallel communication channel or codewords that parents would not detect. One user reminded us, "That's why teens use SnapChat, to keep communication discreet and private".
- In a restaurant, the manager wanted a large summary of end-of-day earnings she could glance at from a 5-foot distance, while walking past the display in near dark conditions, during store closing.

# Usability

- The extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use"
- Five characteristics of usability which must be met for the users of a product:
  - Effective
  - Efficient
  - Engaging
  - Error Tolerant
  - Easy to Learn

## • Effective

- Effectiveness is the **completeness and accuracy** with which users achieve specified goals.
- It is determined by looking at whether the user's goals were met successfully and whether all work is correct.
- The more **informative an interface** can be, the better users are able to work in it without problems.
- The effectiveness of an interface often relies on the **presentation of choices** in a way that is clearly understandable to the user.
- Not all tasks require efficiency to be the first principle.

For example, in interfaces to financial systems (such as banking machines), effective use of the system -- withdrawing the correct amount of money, selecting the right account, making a transfer correctly – are more important than marginal gains in speed.

## • Efficient

- Efficiency can be described as the **speed** (with accuracy) in which users can complete the tasks for which they use the product.
- ISO 9241 defines efficiency as the **total resources expended** in a task.
- Navigation design elements such as **keyboard shortcuts, menus, links and other buttons** all have an impact on efficiency. When they are **well-designed, with clearly expressed actions**, less time and effort are needed for the user to make navigation and action choices.
- Making the right choices for efficient use of the software depends on an **understanding of the users and how they prefer to work**.
  - For example, are they likely to use the interface infrequently or to be habitual users who might learn hidden controls and shortcuts?
  - Do they use the keyboard, mouse or other input devices?
  - Keyboard shortcuts can be extremely efficient for proficient users who work with the interface intensively. If they are the primary interaction tool, they can slow down users who are unfamiliar with them, or with the software.

## • Engaging

- An interface is engaging if it is **pleasant and satisfying to use**.
- The **visual design** is the most obvious element of this characteristic.
- The style of the **visual presentation, the number, functions and types of graphic images or colors** (especially on web sites), and the use of any **multimedia elements** are all part of a user's immediate reaction.
- The **design and readability** of the text can change a user's relationship to the interface as can the way information is chunked for presentation.
- Equally important is the **style of the interaction** which might range from a **game-like simulation** to a **simple menu-command system**.
- The **style of engagement** that is satisfying for a repetitive work tool is different than an e-commerce site.
- Even within the same class of interfaces, different users may have widely **divergent needs**. What is important is that the design meet the **expectations and needs** of the people who must use the interface.

## • Error Tolerant

- The ultimate goal is a system which has **no errors**. But, product developers are human, and computer systems far from perfect, so errors may occur.
- An **error tolerant program** is designed to **prevent errors** caused by the user's interaction, and to help the user in **recovering from any errors** that do occur.
- Errors might also occur because the designer did not **predict the full range** of ways that a user might interact with the program.
- Note that a highly usable interface might treat error messages as part of the interface, including not only a clear **description of the problem**, but also direct links to choices for a **path to correct the problem**.
- For example, if a required element is missing simply presenting a way to fill in that data can make an error message look more like a wizard.

- Some guidelines for preventing errors are:

➤ **Make it difficult to take incorrect/ invalid actions:**

- Design links and buttons to be distinctive, use clear language, avoiding technical jargon, and be sure that dependent fields or choices appear together.
- Limit choices when possible to those which are correct, provide clear examples for data entry, present only appropriate navigation options.

➤ **Make it difficult to take irreversible actions:**

- Provide the ability to back track, provide means to undo or reverse actions, avoid dead-end screens.

- **Easy to Learn**

- Learning goes on for the life of the use of a product. Users may require access to new functionality, expand their scope of work, explore new options or change their own workflow or process.
- An interface which is easy to learn allows users to build on their knowledge without **deliberate effort**.
- This goes beyond a **general helpfulness** to include **built-in instruction for difficult or advanced tasks**, **access to just-in-time training elements**, **connections to domain knowledge bases** which are critical to effective use.
- Allow users to build on not only their prior knowledge of computer systems, but also any **interaction patterns they have learned through use in a predictable way**.
- Predictability is complementary to interface consistency.
- A consistent interface ensures that terminology **does not change**, that design elements and controls are **placed in familiar locations** and that **similar functions behave similarly**.
- Predictability expands this to **place information or controls where the user expects it to be**.

- **Connection to usability goals**

For example, A typical web knowledge management system is used by employees

- **Effective** - "Less than 5% of the registrations will have errors, omissions or inconsistencies requiring a follow-up contact by the staff."
- **Efficient** - "The user will be able to successfully complete the registration in under 3 minutes"
- **Engaging** - "At least 80% of employees will express comfort with using the online system rather than visiting the HR office."
- **Error Tolerant** – "The system will validate all housing, meal and tutorial choices and allow the user to confirm pricing for these options before completing the registration."
- **Easy to Learn** – "Users will be able to successfully complete a benefits calculation without needing any external instruction or help screens."

# To understand the context we can conduct: **Contextual Enquiry/Interview**

- The contextual enquiry research technique combines **observation with interview-style question and response**.
- Participants get to explain their actions or "think aloud" as they work through a task or activity.
- Contextual inquiry is a type of ethnographic field study that involves **in-depth observation** and **interviews** of a small sample of users to gain a robust **understanding of work practices and behaviors**.
- Its name describes exactly what makes it valuable — **enquiry in context**:

**Context:** The research takes place in the users' natural environment as they conduct their activities the way they normally would. The context could be in their home, office, or somewhere else entirely.

**enquiry:** The researcher watches the user as she performs her task and asks for information to understand how and why users do what they do.

# What You Learn From Contextual Interviews

- By going to the user, you see the user's environment and the actual technology the user works with.
- As a result, you'll be able to answer questions such as:
  - Any issues that users are facing
  - Equipment they are working with
  - How their space is set-up
  - Preference between mouse and keyboard`
  - The type of internet connection they have
  - How long does it take to complete common or target tasks
  - Whether there are people there and willing to assist the user if they need help completing a task

# Combining Contextual Interviews and Usability Testing

- In a **usability test**, you usually have all users try to complete the **same scenarios resulting in comparative data** from several people trying the same thing. In **contextual interviews** you watch people's behavior in their **own environment** doing their own tasks.

However, you can combine contextual interviews and usability testing by:

- Combine **watching users** do their own work in their environments with **asking them to try a few of your tasks**.
- **Interview users during a usability tests** to find out the sorts of questions, issues, tasks they would come to the site with.

# Why Conduct Contextual Enquiry

- The contextual-inquiry method was developed by Hugh Beyer and Karen Holtzblatt as a way to **resolve the drawbacks of other qualitative-research methodologies such as surveys and interviews.**
- Methodologies like **surveys** and **interviews** rely on the users' ability to **recall** and explain a process that they are removed from in that moment.
- People attempt to summarize their processes, **but important details like reasoning, motivation, and underlying mental models are left out of this summary**, leaving researchers with only a superficial understanding of the users' approach to the activity.
- However, **users can easily talk about what they are doing and why**, when they are doing it. For this reason, contextual inquiry can provide richer and more relevant information about how users complete processes than self-reported or lab-based research methods do.
- One of the greatest strengths of this methodology is that you get to see things you wouldn't anticipate and **uncover low-level details** that have become habitual and invisible.
- You get to see the **interruptions, superstitious behaviors, and illogical processes** that directly influence UX work.

# Case Study

- <https://centralis.com/casestudies/mercury>
- <https://medium.com/@megmcneilly/case-study-connecting-hotel-guests-and-the-value-of-contextual-observations-8350390cb0f3>

# 4 Grounding Principles

- Contextual enquiry is based on 4 principles that help researchers adjust and apply the apprenticeship model to the context of their products and work.
  - **Context:** The researcher should observe in the natural environment.
  - **Partnership:** The user and researcher are partners in the process of understanding the work.
  - **Interpretation:** The researcher should develop a comprehensive and shared interpretation for all important aspects of the work, aided by feedback from the user.
  - **Focus:** The researcher should understand the purpose of the research project and what information should be sought. This understanding guides the observation and the interviews during sessions.

# 4-Part Session Structure

➤ **Select participants** that are uniquely qualified and knowledgeable in the area you need to understand. Then, use the following 4-part structure as a template to guide your approach.

## The primer

- The primer is meant to **ease the participant into the session**. Starting casually allows your participant to become comfortable with you and learn what to expect from the session.
- Introduce yourself and take some time upfront to **build rapport** with your participant.
- **Indicate what you hope to achieve** during the interview and that you expect the participant to correct any misinterpretations you may develop as you learn.
- Discuss **confidentiality** and get **approval** for any filming or recording you may be doing.

# 4-Part Session Structure(contd.)

## The transition

- When finished with the introduction and general interview, **make an explicit and clear transition into the contextual interview** portion of the meeting.
- Let the user know that you will **watch** while he/she goes about his/her work and that he/she should expect you to **interrupt** whenever you see something interesting to discuss.
- If it is a **bad time for interruption**, he/she should communicate this to you and continue until a better stopping point.

# 4-Part Session Structure(contd.)

## The contextual interview

- This phase usually goes through **multiple iterations**.
- **Watch and learn**.
- **Stop and initiate discussion** when the user does something you don't immediately understand or when you want to confirm an interpretation.
- Try to **understand underlying processes**.
- **Explain your interpretations** of their tasks and workflow for the users to confirm or correct.
- You should initiate discussion for 2 reasons:
  - **If you've observed something you don't understand**. In this case, ask open-ended questions and let the participant give you details about why she took a certain action.
  - **To allow the participant to validate or invalidate your understanding of the user's mental model**

# 4-Part Session Structure(contd.)

## Wrap up

- Ask any **final clarifying questions**.
- **Review your notes and summarize** what you took away from the interview by explaining your interpretation of the observed processes.
- This is your users' chance to give **final clarifications and correct your understanding**.
- The time required for a contextual-inquiry session will depend on the scope context of the work you are intending to understand. They can range from **an hour or two to several days of observations and interviews**.

# Conclusion

- After contextual-enquiry sessions have been completed, researchers and designers should come together to share findings and interpret the results of the interviews.
- Workshop exercises for finding ideas in qualitative data, through **affinity mapping**.
- Contextual enquiry is often coupled with **task analysis**.
- In the end, teams should walk away with a shared understanding of users' work processes, mental models, and common behaviors, so they are prepared to design solutions for their customers

# Interviews

- Interviews are a "**guided conversation where one person seeks information from the other.**"
- An interview may be conducted in conjunction with other requirements-gathering activity such as a site visit, or as a solo activity.
- Interviews may be conducted remotely (via the phone), or face to face.
- A **structured interview** is one where the list of questions is prepared in advance and the researcher tries to solicit answers from all participants.
- A **non-directed interview** is one where the interviewer primarily listens to the subject and provides minimal input or direction.

## Why Do User Interviews?

- Interviews give insights into **what users think** about a site, an application, a product, or a process.
- They can point out what content is memorable, what people feel is **important** , and what ideas for **improvement** they may have.
- They can be done in a variety of situations:
  - **before you have a design**, to create personas, journey maps, feature ideas, workflow ideas
  - to **enrich a contextual inquiry study** by supplementing observation with descriptions of tools, processes, bottlenecks, and how users perceive them
  - at the **end of a usability test**, to collect verbal responses related to observed behaviors

## ➤ Best Practices for Conducting Individual Interviews

- ✓ Set a **goal** for the interview(What you want to learn )
- ✓ Selecting **representative participants** to talk to.
- ✓ Hiring a **skilled interviewer** who knows how to make interviewees feel more comfortable, asks questions in a neutral manner, listens well, and knows when and how to probe for more details
- ✓ Make the user feel as comfortable as possible. **Create a rapport** with the user.
- ✓ **Prepare questions** before the interview.
- ✓ Anticipate different responses, and construct **follow up questions** based on your research goals.
- ✓ Getting permission to **tape the sessions** and have one or more **note takers**

*Examples of how two different people might respond to the same question followup questions (in grey boxes) that the interviewer may ask to get to the same place.*

**One question  
solicits information**

Think for a few moments  
about some time when you  
booked a trip online.

*Wait for a response*

User indicates she has  
a trip in mind.



User indicates Boston.



Can you tell me a little  
about why you chose  
Boston?

**Four questions to solicit  
the same information**

Think for a few moments  
about some time when you  
booked a trip online.

*Wait for a response*

User indicates she does  
not have a trip in mind.



Can you think of any  
places you traveled to in  
the last year?

User indicates she has a  
few trips in mind?

Where did you go?

User lists some places  
she went.



Do you remember who  
booked the travel for  
any of those trips?

User indicates trips  
(including Boston) booked  
by friends, family,  
colleagues, and herself.



For the Boston trip that  
you scheduled, can you  
tell me a little about why  
you chose Boston?

➤ **Prepare more questions than you believe you will have time to ask.**

- Some participants like to talk and give very long answers to questions.
- Others need prompting in the form of follow up questions to deliver the same amount of information.
- Be ready to address both situations.

➤ **Practice your go-to follow up questions.**

- Have at the ready some clear phrases to prompt users to elaborate an answer.

# Types of Interviews

## Structured interview

- **Structured interviews** have **predetermined** questions in a set order.
- They are often **closed-ended**, featuring **dichotomous** (yes/no) or **multiple-choice** questions.
- Asking set questions in a set order can help you see patterns among responses, and it allows you to **easily compare** responses between participants while keeping other factors constant.
- This can **mitigate biases** and lead to **higher reliability and validity**.
- However, structured interviews can be **overly formal**, as well as **limited in scope and flexibility**.
- Structured interviews may be a good fit for your research if:
  - You feel very comfortable with your topic. This will help you formulate your questions most effectively.
  - You have limited time or resources.

## Unstructured interview

- An **unstructured interview** is the most **flexible** type of interview.
- The questions and the **order** in which they are asked are **not set**.
- Instead, the interview can **proceed** more spontaneously, based on the **participant's previous answers**.
- Unstructured interviews are by **definition open-ended**.
- However, so much flexibility means that they can be very **challenging** to conduct properly.
- You must be very careful not to ask questions, leading to **biased responses** causing **lower reliability** or even invalidate your research.
- Unstructured interviews may be a good fit for your research if:
  - Your research question is **exploratory in nature**, and you are seeking descriptive data that will deepen and contextualize your initial hypotheses.
  - Your research necessitates forming a **deeper connection** with your participants, encouraging them to feel comfortable revealing their true opinions and emotions.

## **Semi-structured interview**

- **Semi-structured interviews** are a **blend** of structured and unstructured interviews.
- While the interviewer has a general plan for what they want to ask, the questions **do not have to follow a particular phrasing or order**.
- Semi-structured interviews are often **open-ended, allowing for flexibility**, but follow a **predetermined thematic framework**, giving a sense of order. For this reason, they are often considered **“the best of both worlds.”**
- However, if the questions differ substantially between participants, it can be **challenging to look for patterns**, lessening the generalizability and validity of your results.
- Semi-structured interviews may be a good fit for your research if:
  - You have prior interview experience. It's easier than you think to accidentally ask a leading question when coming up with questions on the fly.
  - Your research question is exploratory in nature. The answers you receive can help guide your future research.

## Limitations of Interviews

- Unlike behavioral data that captures how participants interact with a design, data from interviews is self-reported — it reflects **users' perceptions and feelings about a process, a site, or an interaction**.
- Like any self-reported data interview data is tenuous because:
  - Human **memory is flawed**, so people don't recall events fully or accurately.
  - Participants don't know exactly what is relevant for the interviewer, so sometimes **leave out details**.
  - Some people are proud or private, others are shy and easy to embarrass. Thus, **not everybody will share** every detail with a stranger

# Focus group

- A focus group brings together a **group of participants** to answer questions on a topic of interest in a **moderated setting**.
- A **focus group** is a group interview involving a small number of demographically similar people or participants who have other common traits/experiences. Their reactions to specific researcher/evaluator-posed questions are studied.
- Focus groups are **qualitative** in nature and often study the **group's dynamics and body language** (not expressed in words e.g., people who appear to have something to add but do not speak up).
- The idea is for the researcher to understand participants' reactions. If group members are representative of a larger population, those reactions may be expected to **reflect the views of that larger population**.
- Focus groups can provide more **directed and unfiltered/unbiased feedback** than individual interviews and are **easier to organize** than experiments or large surveys.
- A focus group may be a good fit for your research if:
  - Your research focuses on the dynamics of group discussion.
  - Your questions are complex and rooted in feelings, opinions, and perceptions that cannot be answered with a "yes" or "no."
  - Your topic is exploratory in nature, and you are seeking information that will help you uncover new questions or future research ideas.

- Interviews are more effective when you need to know about participant's needs, opinions or decision making processes.
- This would typically be used to answer questions like "Why do farmers not use fertiliser?", "What type of family planning methods are most appealing to women?" or "Does our solar light work in rural households?".
- Focus groups are more effective when you want stakeholders to generate new ideas through brainstorming.
- Typical examples of questions that would be suitable include "What ideas do chiefs have that could help improve the project?" or "What can health staff do to fix this problem?"

# Competitive analysis

- In the world of UX Design, competitive analysis is a critical part of the research process.
- Whether it's a babysitting app, fintech dashboard, or e-commerce site, **understanding the landscape of solutions** is crucial to the foundation of the solution you are designing.
- A competitive analysis provides **strategic insights** into the features, functions, flows, and feelings evoked by the **design solutions of your competitors**.
- By understanding these facets of competitors' products, you can strategically design your solution with the **goal of making a superior product** and/or experience.
- A UX competitive analysis should be done **prior to starting work on a new project**.
- Since competitors can **emerge at any time** or **may increase (or improve) their offerings**, the competitive research should be iterative and continue as long as you are working on that project.

## ➤ Considerations for competitive analysis

- Create a short **list of main comparison criteria** before you start. You can always add more criteria if it makes sense.
- Start with **3-5 main competitors**. Once you uncover the information you need in order to inform your design decisions, it's time to stop.
- Don't simply copy the designs you find in your research. The **competitors may not be using best practices**.
- Choose the **tool** that helps you present your findings based on the information you are documenting and sharing.
- Know when to perform a "**comparative analysis**."
- Study solutions from products that are **not direct competitors**. For example, if you are designing a solution that includes a calendar scheduling feature, explore the best calendar scheduling solutions.

## Starting a UX competitive analysis

- Some common questions to begin a UX competitive analysis are:
  - Who is currently trying to solve this problem?
  - How are they trying to solve the problem?
  - What their main differentiator or unique value-add is for their business and products
  - Did anyone try to solve it in the past and fail?
  - Why did they fail?
- Once the main competitors have been identified, conduct a heuristic evaluation of the competitor's end-to-end user experience.
- Here are some common user experiences to evaluate:
  - Sign up & Login
  - Ease of account creation
    - Fast or slow
    - Hard or easy
  - Initiating the main task
  - Performing the main task
  - Successful completion of the main task

- Comparison criteria:

- Price
- Service offered
- Age of audience served
- Number of features
- Style and design
- Ease of use
- Type and number of warranties
- Customer support offered
- Product quality
- Product marketing

A competitive analysis report may include:

- A description of your company's target market
- Details about your product or service versus the competitors'
- Current and projected market share, sales, and revenues
- Pricing comparison
- Marketing and social media strategy analysis
- Differences in customer ratings

## Competitive analysis framework

	Your Company	Competitor 1	Competitor 2
<b>Product/service</b>	SEO	SEO/Paid ads	SEO/Website design
<b>Market share</b>	25%	40%	35%
<b>Growth</b>	6%	12%	8%
<b>Target audience</b>	Dentists	Dentists	Dentists
<b>Price structure</b>	Monthly fee	Hourly	Project-based
<b>Marketing strategies</b>	Email/Blog	Email/Blog/ Social media	Social media/ Email/Paid ads
<b>Customer satisfaction</b>	★★★★★	★★★★★	★★★★★
<b>Strengths</b>	All-inclusive/ one fee	Brand visibility	Package deals
<b>Weaknesses</b>	Startup with less resources	Expensive	Questionable customer service
<b>Key advantage</b>	Strong values and mission	Industry leader	Highly skilled team

# Websites for kitchen and bathroom fixtures: Visual, quantitative, and qualitative competitive analysis

<p><b>1</b></p> <p><b>Kohler</b></p> <p><b>Main Navigation Structure (visual)</b></p> <p>Horizontal navigation. Drop down once clicked. Drop down covers the width of the screen allowing the navigation to be the focal point. There are many links to consider, however the Information Architecture is well established creating ease of use. Consistent navigation throughout site. Apart from home page, the nav bar is sticky.</p>	<p><b>C</b></p> <p><a href="http://50years.vola.com/en">http://50years.vola.com/en</a></p> <p>Vertical Navigation. Slides in to the right upon click. Navigation covers small portion of the right portion of the page. Information Architecture makes little sense. This site is not easy to navigate intuitive to the user.</p>
<p><b>2</b></p>	<p></p>
<p><b>3</b></p> <p><b>Inspiration Content vs Presenting Products (yes/no)</b></p> <p>Both: Inspiration Content is found @ <a href="https://ideas.kohler.com/search?type=mood%20board%20bathroom">https://ideas.kohler.com/search?type=mood%20board%20bathroom</a> Whereas Presenting their Products is found @ <a href="https://www.us.kohler.com/us/">https://www.us.kohler.com/us/</a> Kohler appears to be more product forward vs inspiration forward.</p>	<p>The Vola site has both its inspirational content and product presenting kept separately.</p>
<p><b>4</b></p> <p><b>Link:</b></p> <p><a href="https://ideas.kohler.com/search?type=mood%20board%20bathroom">https://ideas.kohler.com/search?type=mood%20board%20bathroom</a></p>	<p><a href="https://en.vola.com/catalog/">https://en.vola.com/catalog/</a></p>
<p><b>5</b></p> <p><b>Link:</b></p> <p><a href="https://www.us.kohler.com/us/">https://www.us.kohler.com/us/</a></p>	<p><a href="https://en.vola.com/inspiration/">https://en.vola.com/inspiration/</a></p>
<p><b>6</b></p> <p><b>Ease of Navigation (1 worst - 5 best)</b></p> <p>5</p>	<p>3</p>
<p><b>7</b></p> <p><b>How Many Steps to Get to a Spec Sheet</b></p> <p>5 Steps</p>	<p>5 Steps</p>
<p><b>Spec Sheets</b></p> <p>Easy to find, includes both metrics, easy to understand. <b>Still waiting on User Interviews to see what each persona really looks for in a spec sheet.</b></p>	<p>The user has the option to preselect "Liter" or "Gallon" for their spec sheet prior to the download.</p> <p></p>
<p></p>	

# Digital real estate experiences: visual and qualitative competitive analysis

## Competitive Analysis

### Real Estate Disruptors

The residential real estate market, with \$1.4 trillion in annual transaction volume, has been largely undisturbed for decades. That provides an enormous opportunity for companies like Proffer, REX, Open Listings, Open Door and OfferPad to upend this giant market.



OPEN LISTINGS

OFFERPAD

Opendoor

#### Company Info

NAME: REX  
Markets: Southern California only  
Founded: May 2015

NAME: Open Listings  
Markets: All of California  
Founded: March 2014

NAME: Open Door/OfferPad  
Markets: Phoenix primarily (Las Vegas, Salt Lake City, Tampa, Orlando, Los Angeles)  
Founded: December 2014/mid-2015

#### Description

For a total fee of 2% REX takes care of everything both buyers and sellers need.

Focused exclusively on representing buyers, goal is to make homeownership more affordable by refunding 50% of their commission.

They buy your home for cash usually within 7-10 days.

#### Screenshots



#### Strengths & Weaknesses

##### Strengths

- Eliminates the traditional 5-6% agency commission
- For every 20 homes they sell, they provide a home for a family in need
- Regularly provides hands-on support to local nonprofits that provide shelter to families

##### Weaknesses

- Limited to SoCal
- Homes are not listed on the MLS

##### Strengths

- Gives back half the agent's commission (generally 1.25%)
- Special sections for "shitty listings" (fixer uppers) as well as architectural listings
- "Homes Near Work" feature works with companies in LA and SF to make buying homes near work more affordable

##### Weaknesses

- Limited to California
- Mainly for buyers

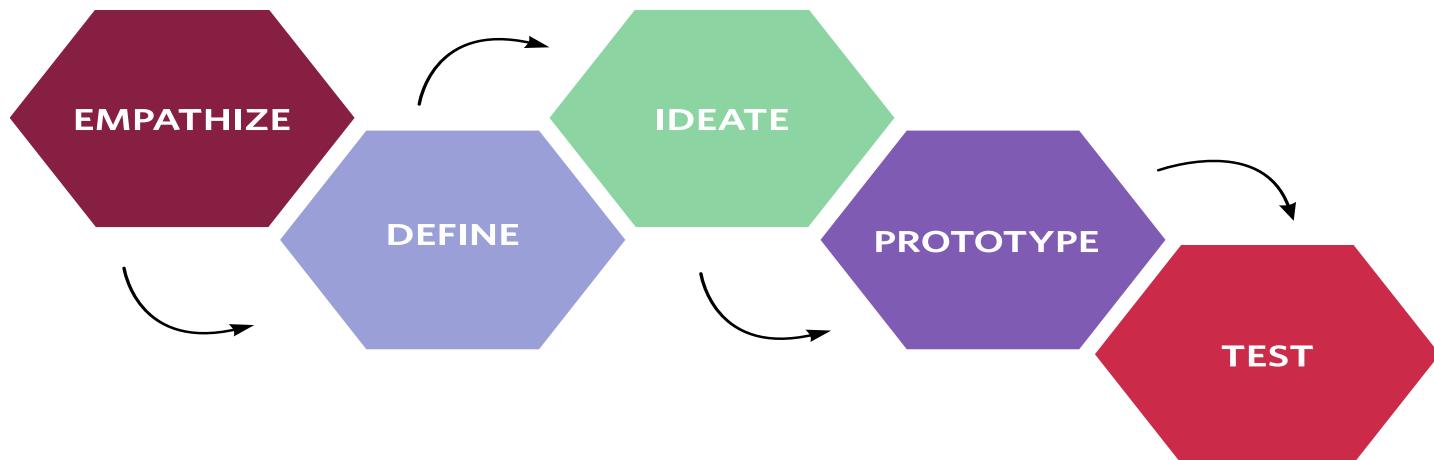
##### Strengths

- Makes it quick and easy to sell a house without the pain points
- You pick the day you close and move (between 5-90 days)
- 30 day satisfaction guarantee and 2 yr. warranty on electrical and major appliances
- Early Access allows home buyers to preview Opendoor homes before they are listed to personalize the home with features and upgrades they want before the sale closes.

##### Weaknesses

- Limited to Phoenix and certain other limited markets
- Mainly for sellers
- They are competing against each other in the same markets

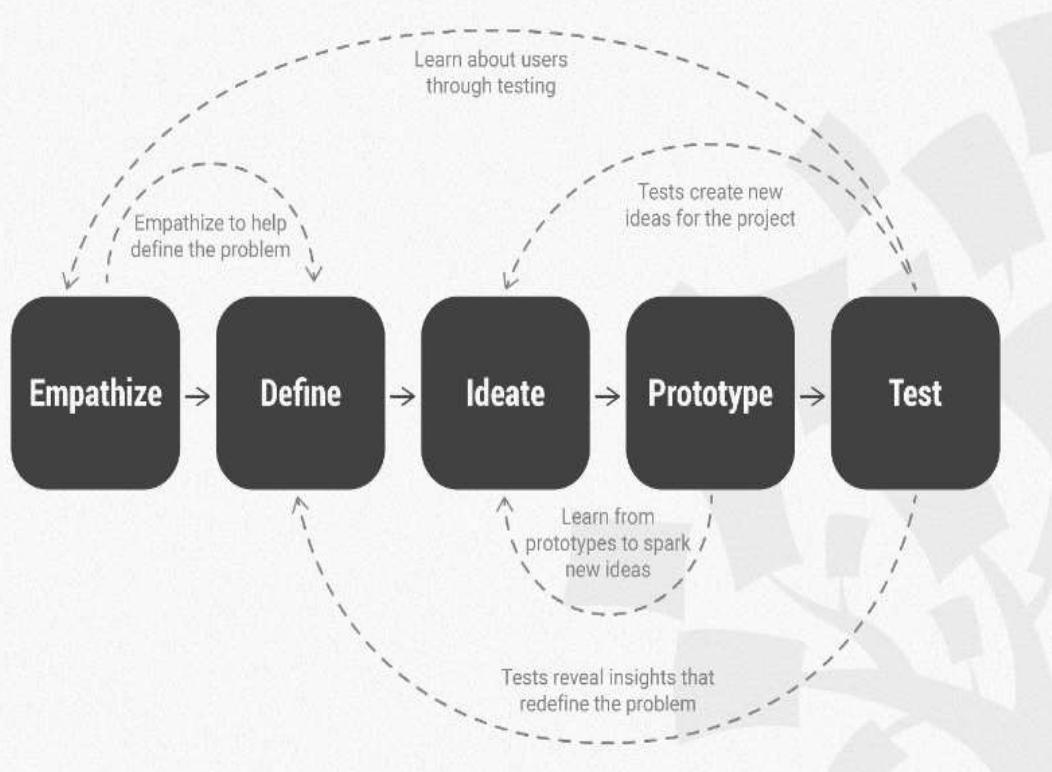
# Design Thinking



Human centered approach to innovation

- *A process that utilizes empathetic, creative, Innovative and analytical skills to provide solutions to a problem.*

## DESIGN THINKING: A NON-LINEAR PROCESS

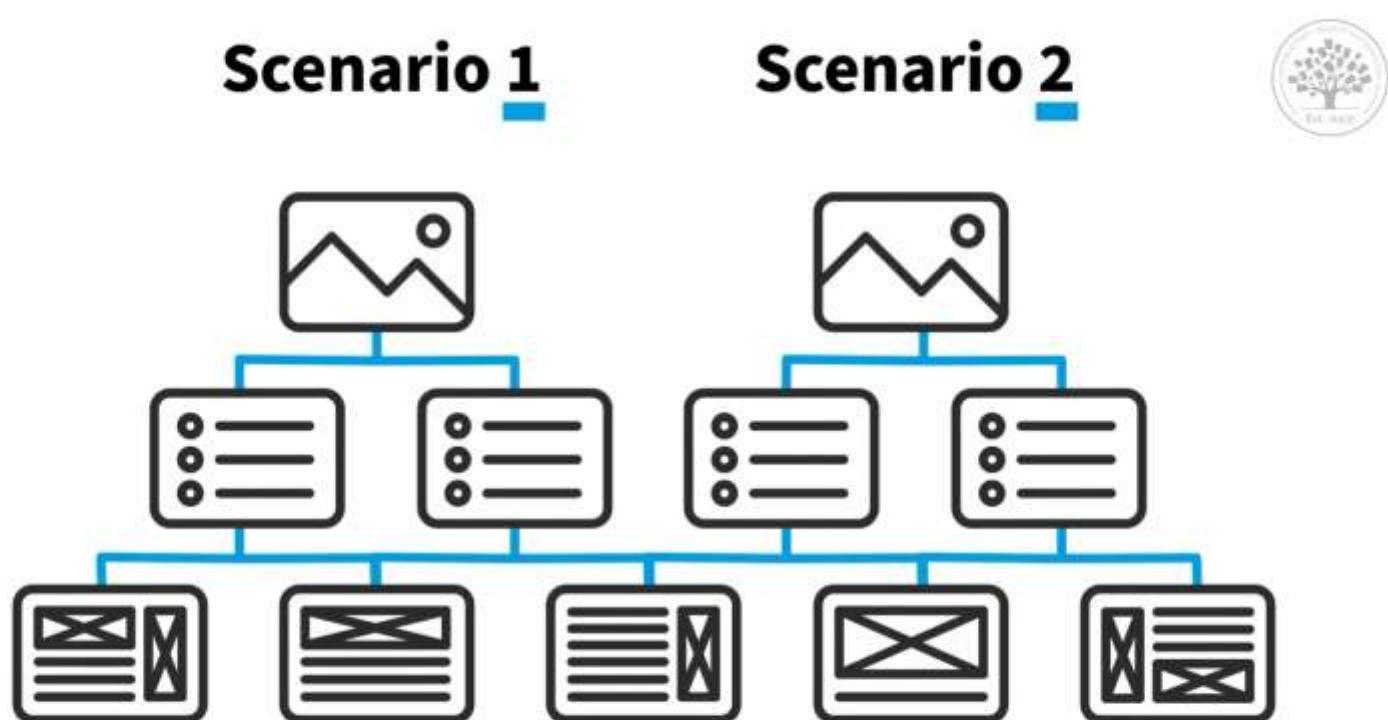


# Scenarios and Persona Technique

## What are User Scenarios?

- A **scenario** is a situation that captures how users perform tasks on your site or app.
- User scenarios describe the user's motivations for being onsite (**their task or goal**) and/or a question they need answered, and suggest **possible ways to accomplish these objectives**.
- It is essentially a development of the **user story**, and can relate to multiple target users.
- User scenarios are detailed descriptions of a user – typically a persona – that describe **realistic situations** relevant to the design of a solution.
- By painting a “rich picture” of a **set of events**, teams can appreciate user interactions in context, helping them to understand the practical needs and behaviors of users.
- A scenario derived from a **use case**.
- Use cases are intended to describe all of the possible outcomes from a particular set of events.
- The term “scenario” is used in this context to describe **just one path** – one set of outcomes – through the use case.

Individual scenarios are usually describing a particular path through an interactive system.



# Personas

- Personas are **fictional characters**, which you create based upon your research to represent the different user types that might use your service, product, site, or brand in a similar way.
- Creating personas will help you **understand your users' needs, experiences, behaviors and goals**.
- It can help you recognize that **different people have different needs and expectations**, and it can also help you identify the user you're designing for.
- Personas make the design task at hand less complex, they **guide your ideation processes**, and they can help you to achieve the goal of creating a good user experience for your target user group.

- Hence, personas **do not describe real people**, but you compose your personas based on **actual data collected from multiple individuals**.
- Personas add the **human touch** to what would largely remain cold facts in your research.
- Creating persona profiles of **typical(average) or atypical (extreme)** users will help you understand patterns in your research, which synthesizes the types of people you seek to design for.
- In the design thinking process, designers will often start creating personas during the **second phase, the Define phase**.
- Using personas can help designers **move on to the third phase, the Ideation phase**.

# Create a Persona

## JOBS TO BE DONE:

What does the person want to do with the product/service...what is his/her objective (or goal)

## USE CASES:

- How is the product/service used?
- By whom?
- When?
- Where?
- How is it bought (paid for)?
- Where did the person learn about the product/ service

## NAME:

Persona description – Age, gender, residence, occupation, hobbies....



## PAIN POINTS

What irritates the person about the Product / service ?

## GAIN POINTS

What are the current support the person has that makes him happy about the product/service?

**\*It is important to imagine the typical user as a “real person”**

# Clark Andrews

AGE 26

OCCUPATION Software Developer

STATUS Single

LOCATION San Jose, CA

TIER Experiment Hacker

ARCHETYPE The Computer Nerd

Friendly

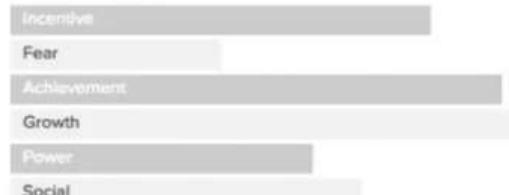
Clever

Go-Getter



"I feel like there's a smarter way for me to transition into a healthier lifestyle."

## Motivations



## Goals

- To cut down on unhealthy eating and drinking habits
- To measure multiple aspects of life more scientifically
- To set goals and see and make positive impacts on his life

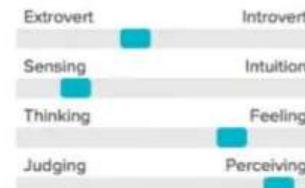
## Frustrations

- Unfamiliar with wearable technology
- Saturated tracking market
- Manual tracking is too time consuming

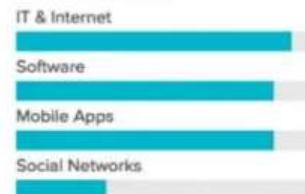
## Bio

Aaron is a systems software developer, a "data junkie" and for the past couple years, has been very interested in tracking aspects of his health and performance. Aaron wants to track his mood, happiness, sleep quality and how his eating and exercise habits affects his well being. Although he only drinks occasionally with friends on the weekend, he would like to cut down on alcohol intake.

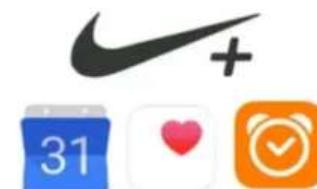
## Personality



## Technology



## Brands



# Brainstorming

- Brainstorming is an invention and discovery strategy in which the researcher **collaborates with others** to **explore topics, develop ideas**, and/or **propose solutions** to a problem.
- It is the process for generating creative ideas and solutions through **intensive and freewheeling group discussion**.
- Every participant is encouraged to think aloud and suggest as many ideas as possible, no matter how seemingly **outlandish or bizarre**.
- The purpose of a brainstorming session is to work as a group to **define a problem and find a plan of action to solve it**.
- Brainstorming aims not just to think of topics to write about but to allow a group to problem-solve when a researcher in the group is, essentially, suffering from a block.

# Brainstorming Strategies

Brainstorming strategies are many and varied, but they can be grouped into the following basic areas:

## **1. Listing:**

- In this technique, also called bulleting, you jot down broad ideas quickly as they come to your mind in any order.
- For those who are better at texting than visuals
- List out main topic and then sub topics

## Idea list (example)

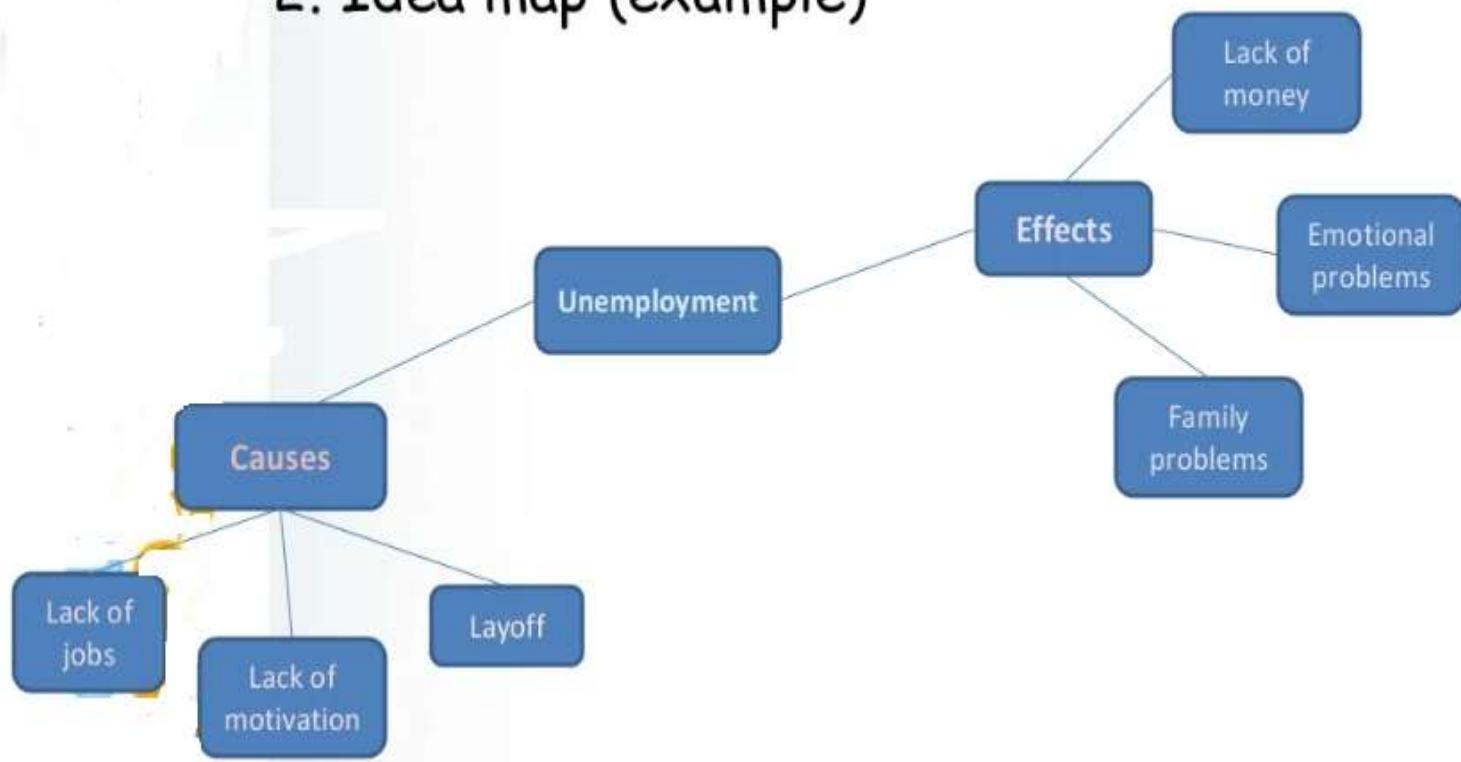
### Topic - Unemployment

1. Jobs
2. Poverty
3. Salary
4. Lack of education
5. Lack of jobs
6. Low salary
7. Lack of money
8. Fresh graduates

## 2. Mapping:

- This technique lets you **visualize concepts and ideas**. Also known as “**mind mapping**”, this technique starts with a research question or main idea, then adds branches with synonyms, related topic, keywords, and examples.
- This method is also called **webbing** because you end up with something that looks like a spider web with your brainstormed ideas branching out from the main topic in the center.

## 2. Idea map (example)



# Example of Mind mapping



### 3. Cubing:

- This strategy enables you to consider your topic from **six different directions**, just as in a cube, which is six-sided.
- In cubing, you take an idea and describe it, compare it, associate it, analyze it, apply it, and argue for and against it.

## Cubing

- an idea is examined from six distinct viewpoints.

- You describe the topic (what is it?)
- Compare and contrast it (what is it like or unlike?)
- What do you associate it with (what does it remind you of?)
- Analyze it (what are its parts?)
- Apply it (in what ways can it be utilized)
- Argue for or against it (in what ways can you support or oppose it?)

## Cubing



## Describe it

Customers don't know how to use the product

## Compare it

Competitors provide YouTube videos explaining how to use the product

Competitors walk you through the product if it's your first few times using it

## Associate it

Customers aren't as involved in the product as they could be because they don't know how to use it

Customers are frustrated

## Analyze it

Add a feature where you can search where things are in the product

in-product tutorials

Free online courses that let you get certified in the product

Simple interface

Mimic other product's placement of buttons

## Apply it

Used for documentation

Used during brainstorming sessions

Used by working professionals

## Argue for and against it

Pro: Easier to use the product

Pro: Improved customer satisfaction

Pro: Updated product

Pro: Happier customers

Con: Hard to differentiate from other products

Con: Hold off on other features to release

Con: Need to keep things simple not unique

### 3. Cubing example

#### Too much money is spent on toys

Describe it.	Compare it	Associate it.	Analyse it.	Apply it.	Argue for and against it.
Recent trends in entertaining children are extending to much more expensive forms. Too much money or not enough?	Lifestyle changes (working parents/ technological advancement/ urban development) mean that this generation of children need to play indoors, be kept entertained with minimum supervision.	Socialisation and technology.	Are our children becoming increasingly isolated and insular because they play alone rather than together...Is the money spent on toys and games worth the negative outcomes?	The money spent on toys and games is having a negative effect on the physical and emotional well being of our children. The next generation will have been robbed of the simple pleasure: skipping, playing under trees, flying a kite.	Society has changed. The extended family of 'man' is not viable anymore; we have to replace it. Parents choose to keep their children safe with an unending supply of entertainment in house rather than battle the urban jungle. Technology has advanced and children are more adept at e-games than other forms of play. Catering to that is not wrong.

## 2. Freewriting:

- When you freewrite , you let your **thoughts flow freely**, putting pen to paper and writing down whatever comes to your mind, or to the group members' minds.
- Set a time limit and no. of words or pages.

## Sample Free Write about a name

### Cassandra

She is a fashionista.

A Grade 11 student, Senior High, with moderately good grades  
Moderately popular, has a good group of friends and is generally well-liked

Comes from a nuclear family: parents still together and an older brother

The older brother is the black sheep of the family, the rebel, the trouble-maker

Allergic to both cats and dogs

Recently dumped by her highschool sweetheart

Light brown hair with purple highlights running through it; a chic bob that comes to her chin, cut to that length after her break-up

Has had the same best friend since the second grade, Erika, whom she first met at a neighborhood-wide birthday party for Erika and her twin brother, Steven

Unaware of Steven's long-term crush on her

Loves the rain, especially in the summer, but hates the rainy days; gets cold easily

Confident and likes to laugh, but is not very witty and not very good at telling jokes

## 5. Researching:

- Also called the journalistic method, with this technique, you use the “big six” questions that journalists rely on to research a story: **who, what, when, where, why, and how**.
- Go to the library or search on internet for information.
- You and your group then take a few minutes to research the answers to these questions if needed or simply discuss the answers if group members know the information.

Perform Brainstorming session on:

Q-commerce Players Creating Disruption in E-commerce  
Ecosystem.....Adding Q-commerce to existing Ecommerce business

# UNIT 5

# CONCEPT DEVELOPMENT

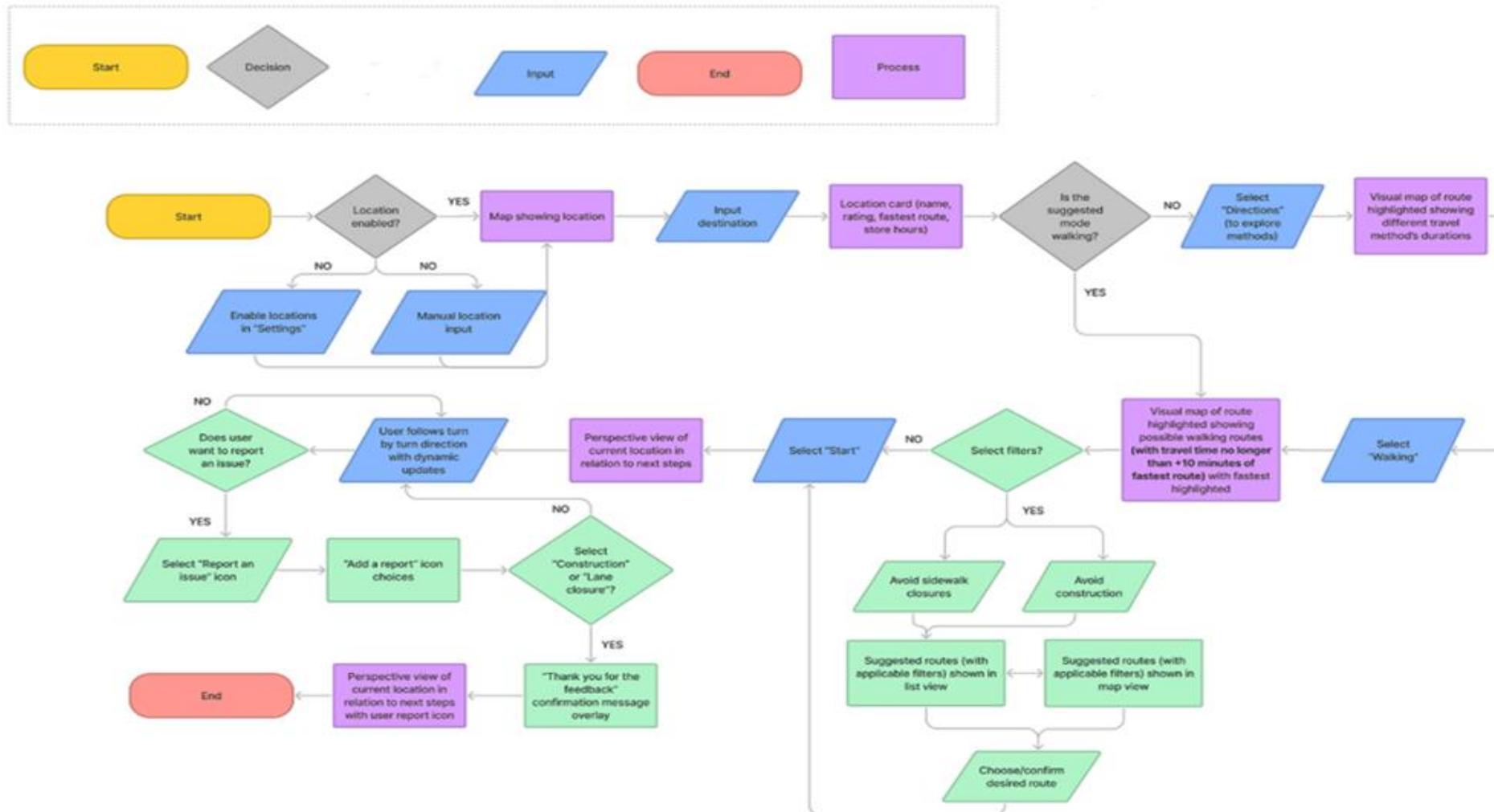
# Task Flow

- A task flow is a diagram that represents a user's journey through a specific task.
- Instead of viewing a single piece of content in isolation, a task flow allows you to consider how one piece of content connects to the next. These connections form the paths that users travel to arrive at their endpoint.
- Before beginning content planning or creation, you can use task flows to figure out what your users are trying to accomplish. What are their main goals as they navigate your content.
- Task flows tend to be linear, showing the high-level steps that a person would take to get to a specific goal or end point.

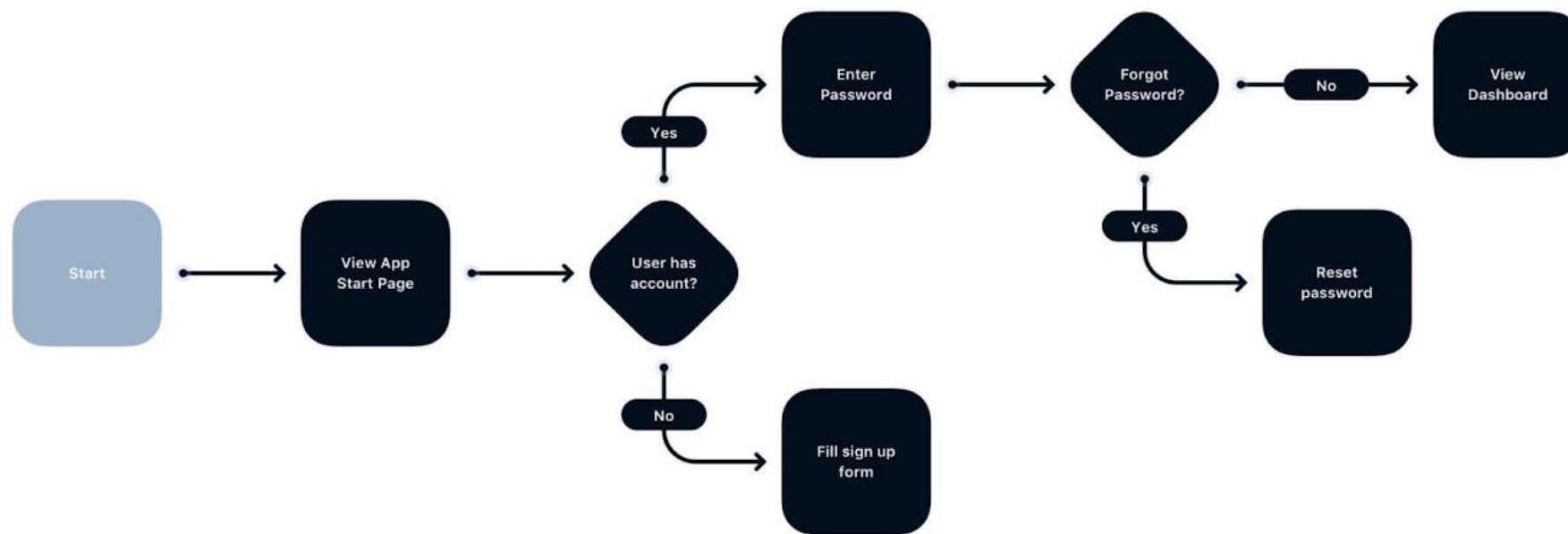
# Task flow analysis

- A step-by-step analysis of how a user will interact with a system in order to reach a goal.
- This analysis is documented in a diagram that traces a user's possible paths through sequences of tasks and decision points in pursuit of their goal.
- The tasks and decision points should represent steps taken by the user, as well as steps taken by the system.
- To validate a design team's understanding of users' goals, common scenarios, and tasks, and to illustrate in a solution-agnostic way the overall flow of tasks through which a user progresses to accomplish a goal.
- Task flow diagrams also help surface obstacles in the way of users achieving their goal.

## Google Maps Task Flow - Adding a feature to filter walking routes



## TASK FLOW

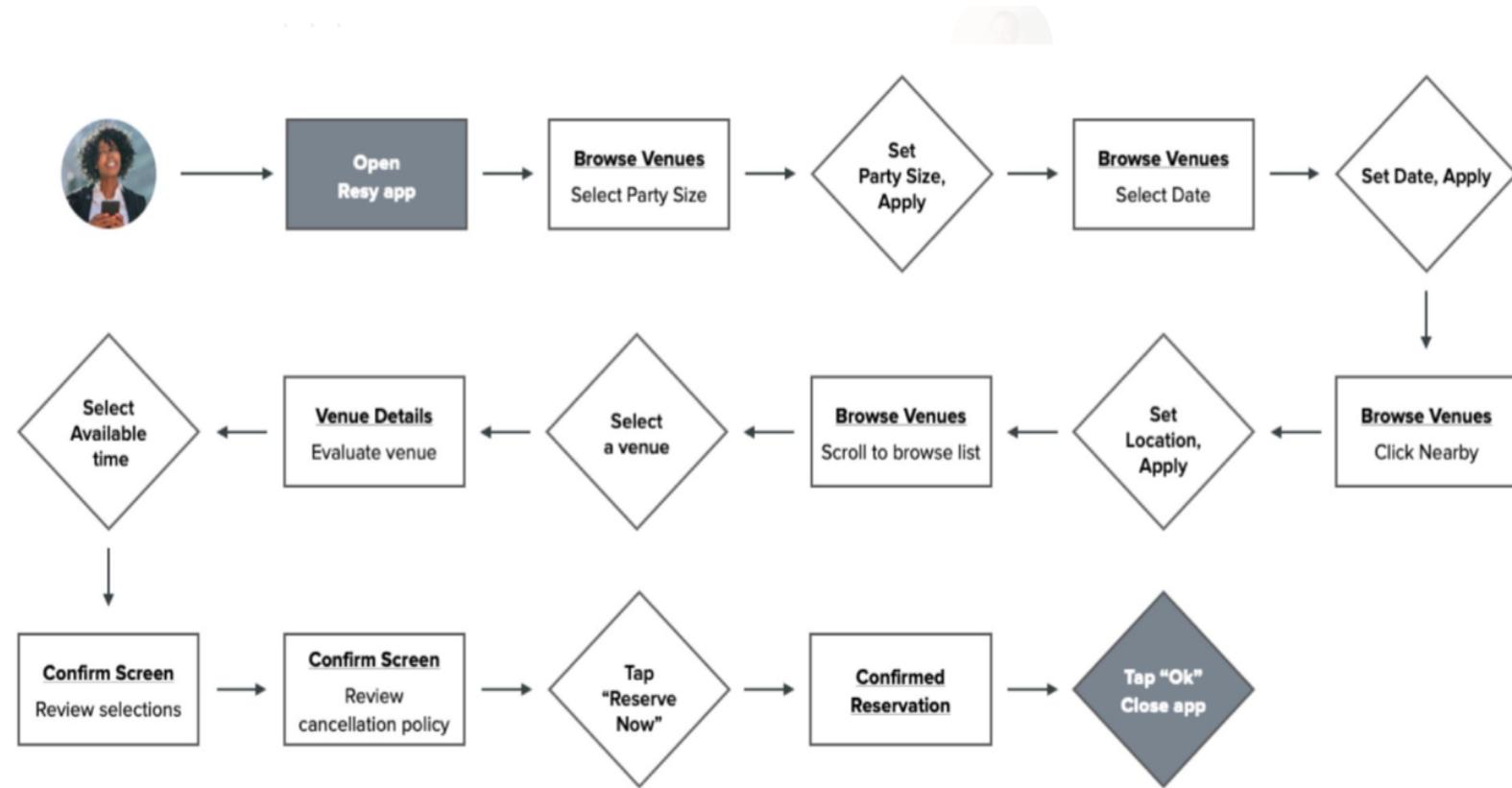


# Task flow :

## KARLA'S TASK FLOW:

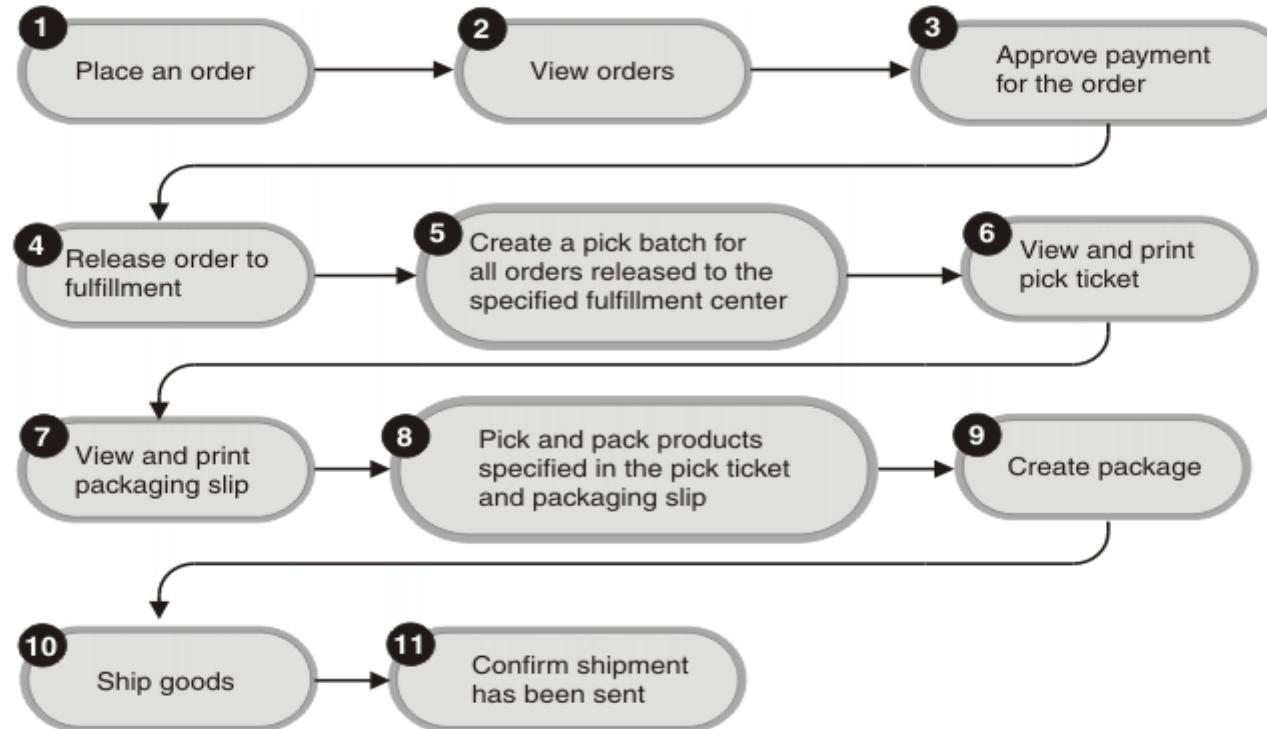
Karla is looking to find a nice restaurant and book a reservation during an upcoming vacation that her and 3 of her friends are taking in Boston.

She uses the Resy app to find and book reservations at local restaurants in NYC and would like to use the app for this booking as well.



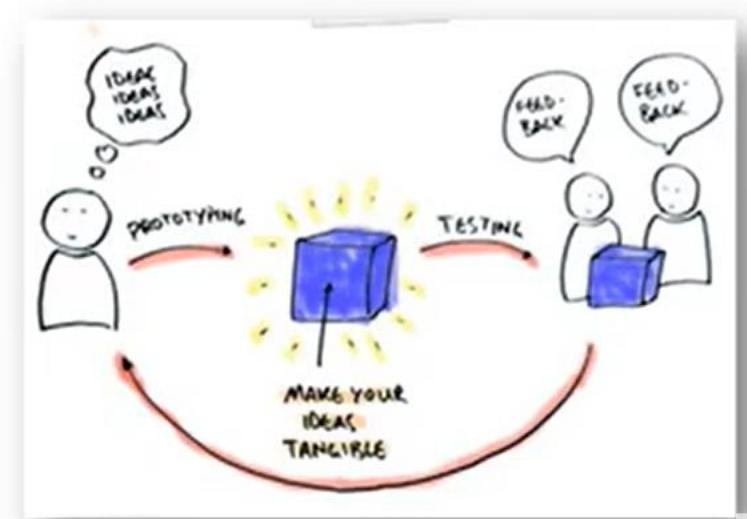
achieving their goal. Define the edge cases later.

# Task flow for Order Management



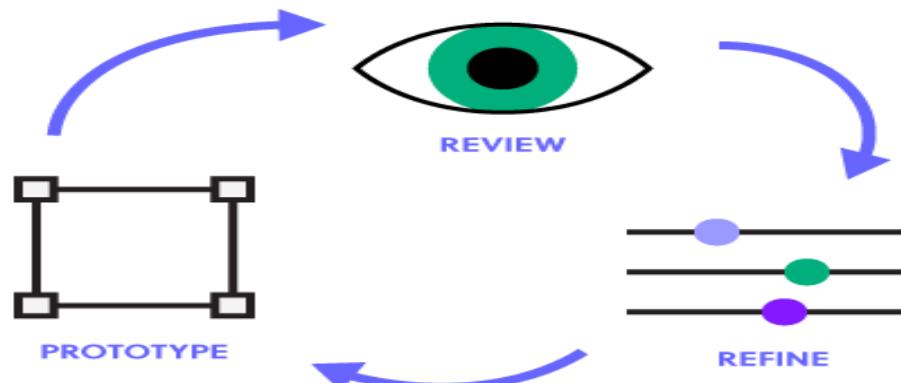
# What is Prototyping?

- A Prototype is the concrete representation of all interactive system.
- A Prototype is tangible artifact or model, not a detail description of project.
- Every stakeholders like Designers, Managers, Developers, Customers & End Users can use this model.



# Prototype

- A prototype is “*A simulation or sample version of a final product, which UX teams use for testing before launch.*”
- The goal of a prototype is to test and validate ideas before sharing them with stakeholders and eventually passing the final designs to engineering teams for the development process.
- Prototypes are essential for identifying and solving user pain points with participants during usability testing.
- Testing prototypes with end-users enables UX teams to visualize and optimize the user experience during the design process.



Prototypes have four main qualities:

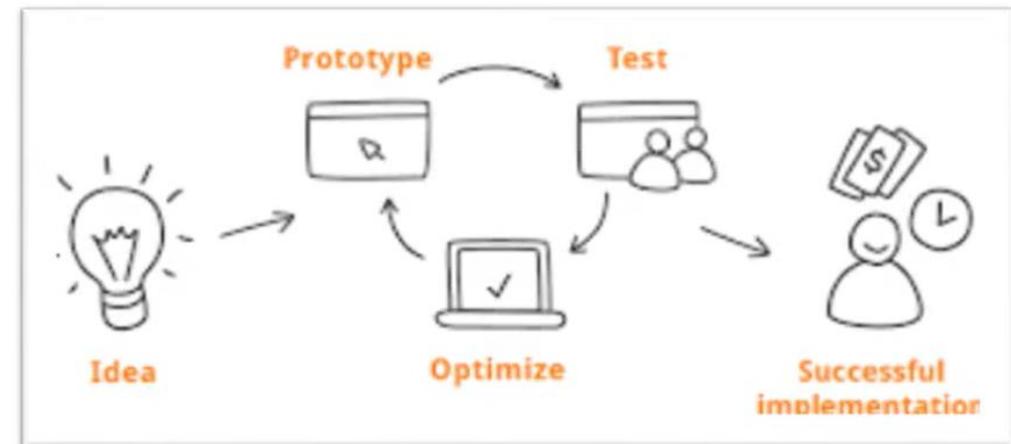
- **Representation** — The prototype itself, i.e., paper ,model, HTML and desktop application.
- **Precision** — The fidelity of the prototype, meaning its level of detail—low-fidelity or high-fidelity.
- **Interactivity** — The functionality open to the user, e.g., fully functional, partially functional, or view-only.
- **Evolution** — The lifecycle of the prototype. Some are built quickly, tested, thrown away, and then replaced with an improved version (known as “rapid prototyping”). Others may be created and improved upon, ultimately evolving into the final product.

# Format of Prototyping

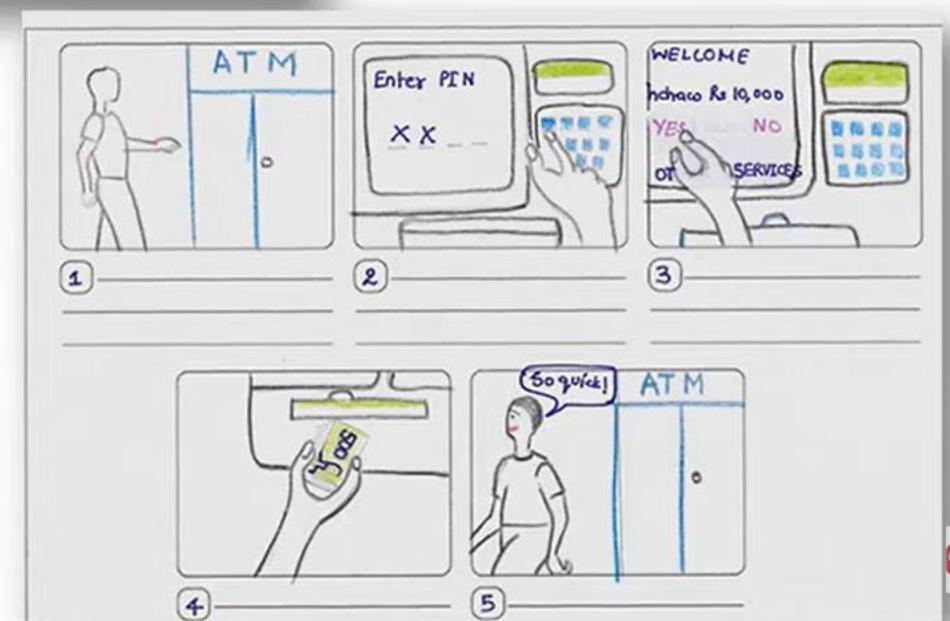
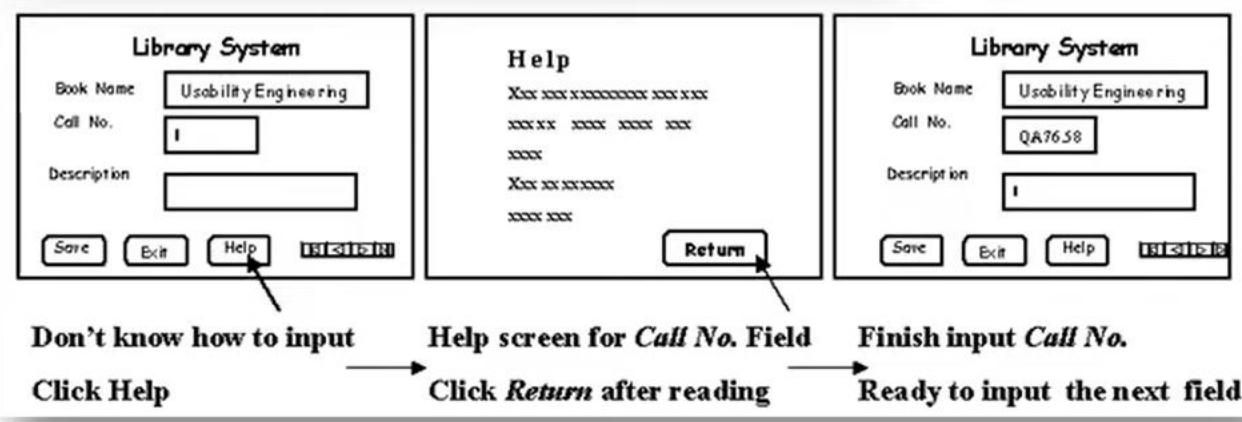
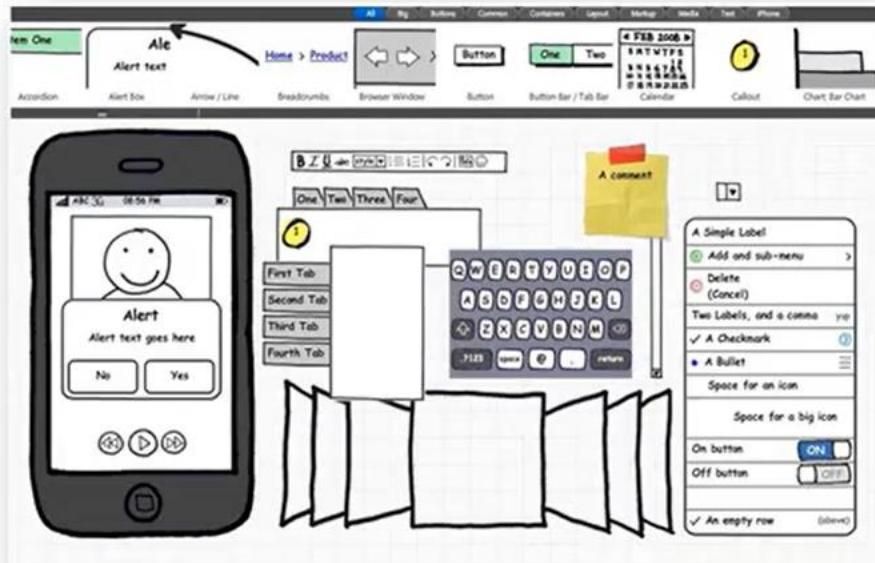
- In interaction design it can be any of the following (and more):
  - a series of screen sketches
  - a storyboard, i.e. a cartoon-like series of scenes
  - a PowerPoint slide show
  - a video simulating the use of a system
  - a lump of wood or a cardboard mock up
  - a piece of software with limited functionality written in the target language or in another language

# Need for Prototyping

- Evaluation and feedback are central to interaction design.
- Stakeholders can see, hold, interact with a prototype more easily than a document or a drawing.
- Team members can communicate effectively
- You can test out ideas for yourself.
- Aim is to save on time and money
- Aim is to have something that can be tested with real users.

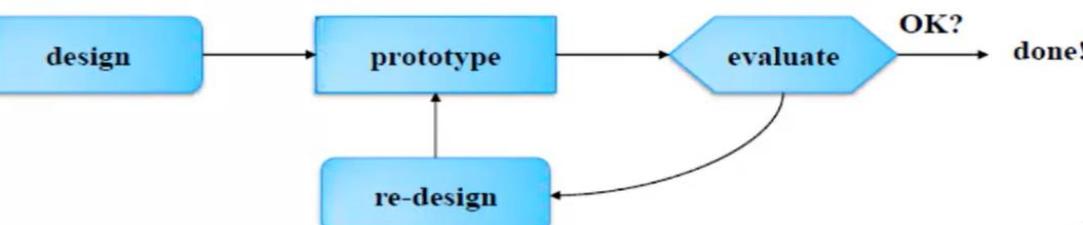


# Examples of Prototyping

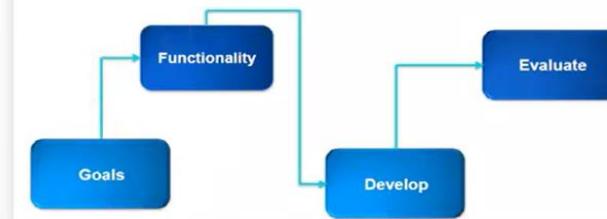


# Concept of Prototyping

- You never get it right first time
- If at first you don't succeed ...



JOURNEY OF THE PROTOTYPING PROCESS



# Goals Of Prototyping

- **Exploring Requirements:**

Market analysis, participatory design.

- **Choosing Among Alternatives:**

Risky or critical features, go/no-go decisions.

- **Empirical Usability Testing:**

As early as possible, try out ideas with target users.

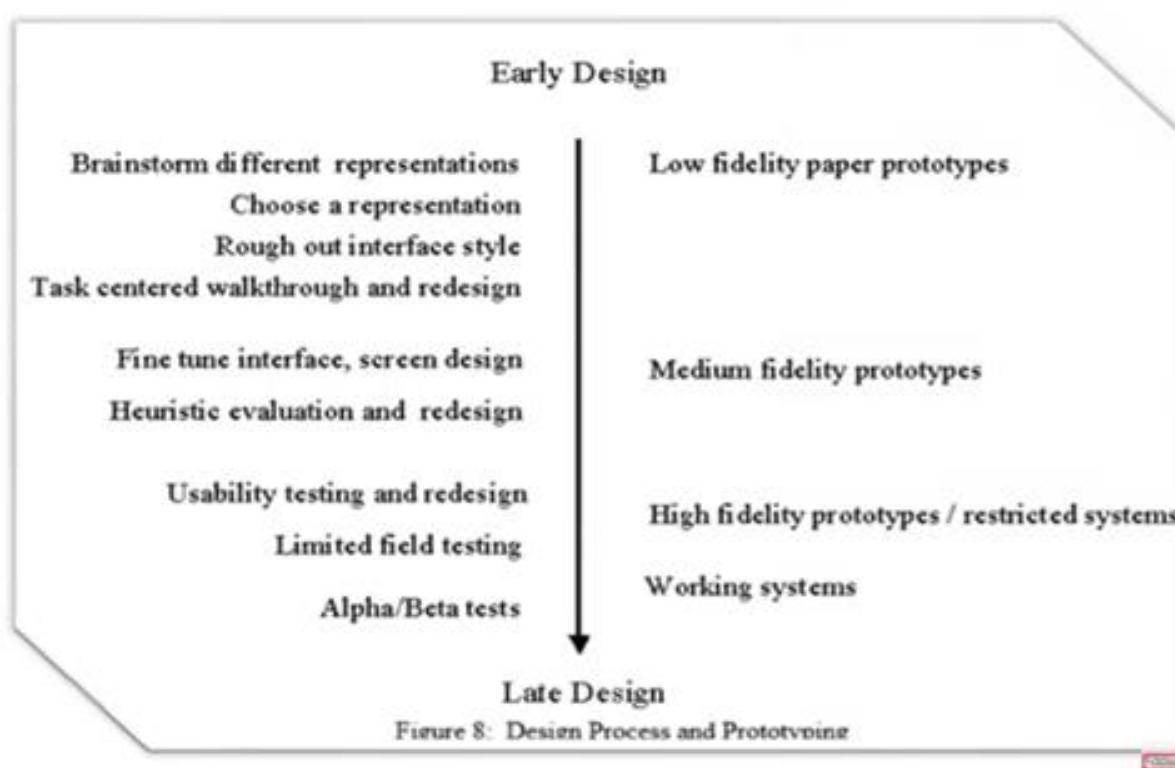
- **Evolutionary Development:**

May deliberately choose a malleable software platform, building software incremental, iterative fashion.



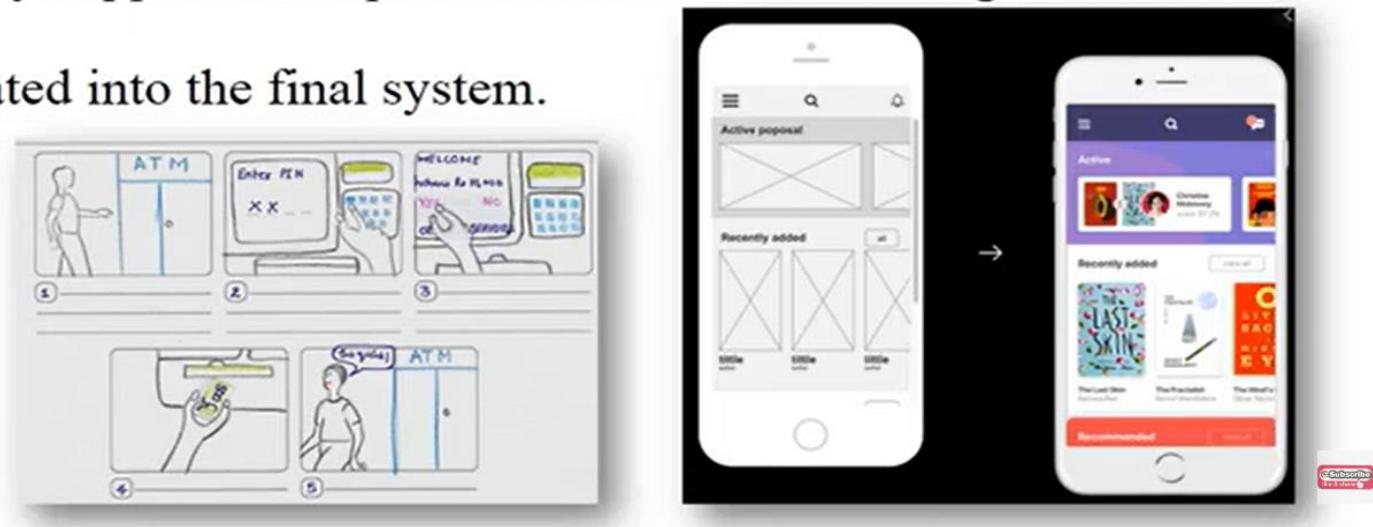
# Types of Prototyping

1. Low Fidelity Prototyping
2. Medium Fidelity Prototyping
3. High Fidelity Prototyping



## Type 1: Low Fidelity Prototyping

- Uses materials that are very different from the intended final version, such as paper and cardboard rather than electronic screens and metal.
- Used during early stages of development.
- Cheap and easy to modify so they support the exploration of alternative designs and ideas.
- It is never intended to be integrated into the final system.
- They are for exploration only.

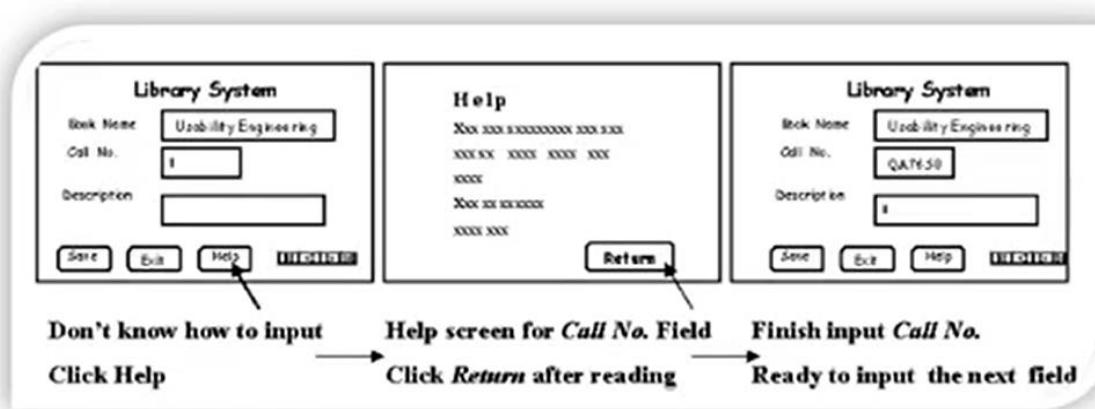


# Examples of Low Fidelity Prototyping

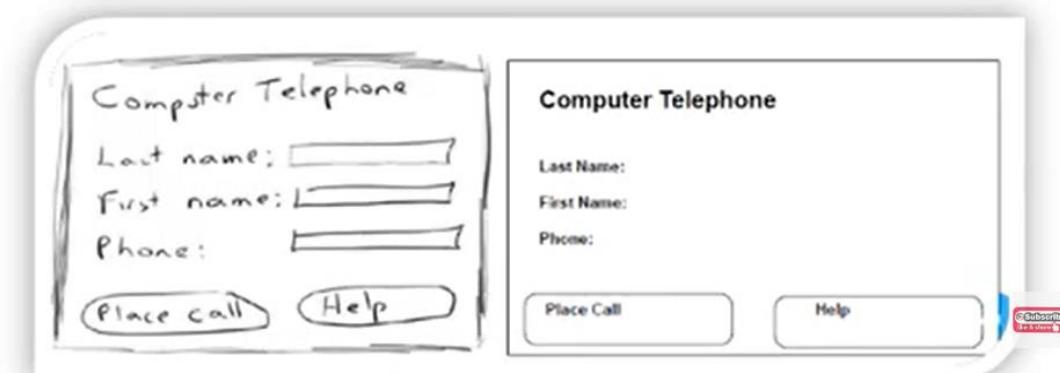
## Examples:

1. **Storyboards:** Described in detail scenarios & use of system.

A series of key frames as sketches



2. **Sketching:** Sketch only outwear appearance, Focus on high level concept. Difficult to visualize internal structure.



## Type 2: Medium Fidelity Prototyping

- This type of Prototype Built Using Computers.
- Its More Powerful then Low Fidelity Prototyping.
- It engaging more users in the system.
- It implemented through screen design tools.

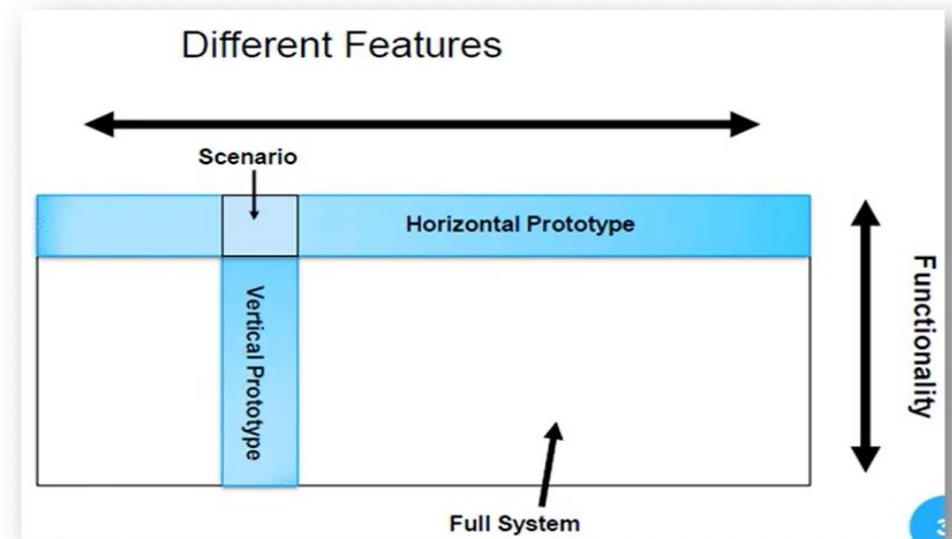
It has two types:

1. **Vertical Prototype:** Implemented in depth & limited no. of features.

Examples: Menu Items.

2. **Horizontal Prototype:** Implemented in sequential mode.

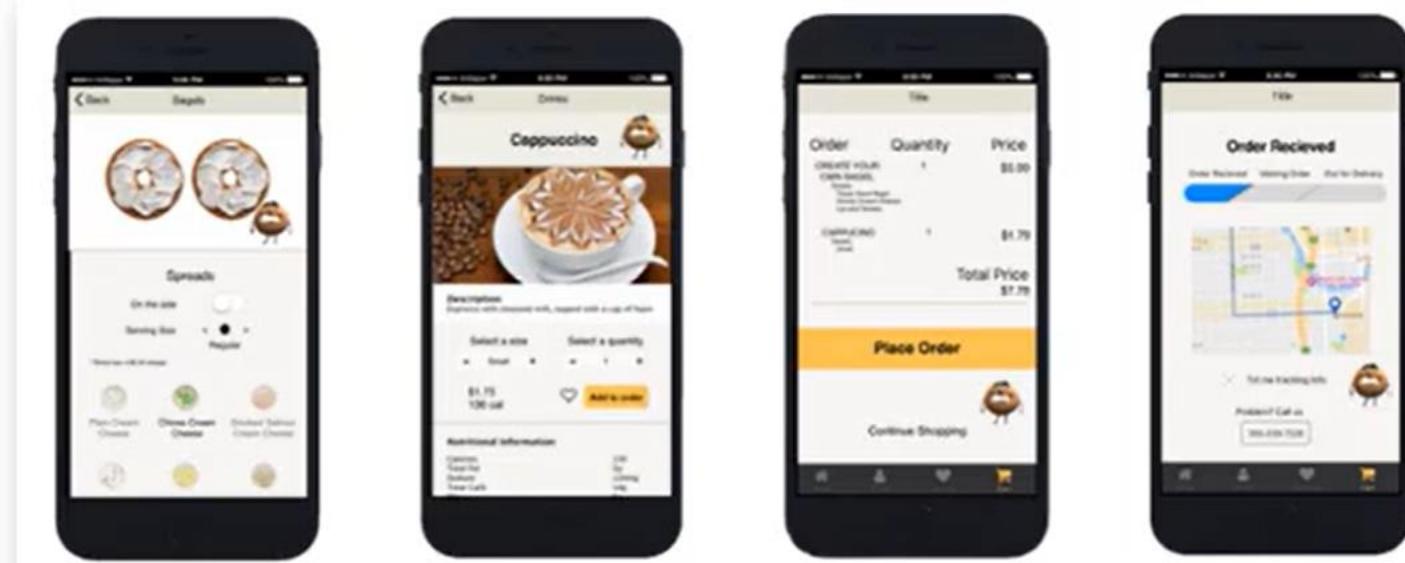
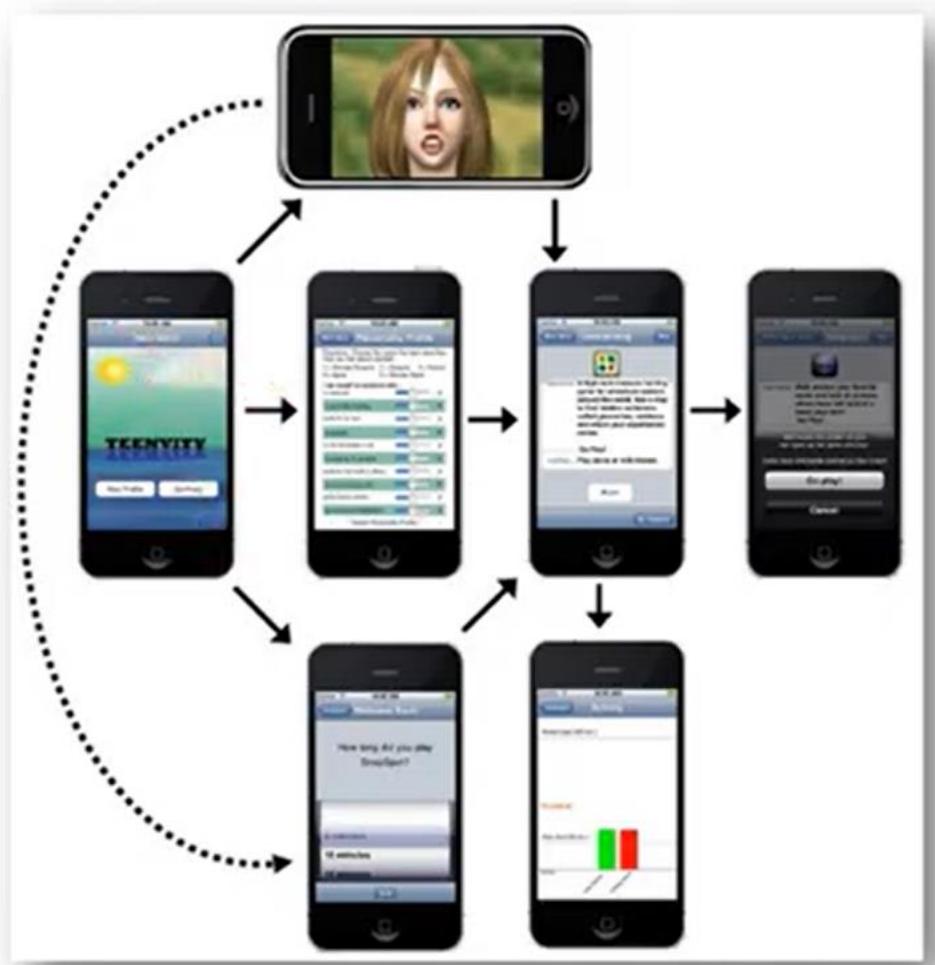
Examples: Animations, Slides etc.



## Type 3: High Fidelity Prototyping

- High-fidelity prototypes represent the core functionality of the products user interface.
- High fidelity prototypes are fully interactive systems.
- Users can enter data in entry fields, respond to messages, select icon to open windows and interact with user interface as if it were a real system.
- They trade-off speed for accuracy.
- Building high fidelity prototypes consume resources and have high cost.
- It includes full Software Implementation, Manpower, Time, Efforts, Money etc.

# Examples of High Fidelity Prototyping



# Comparison of Low Fidelity And High Fidelity Prototyping

Type	Advantages	Disadvantages
Low-fidelity Prototypes	<ul style="list-style-type: none"><li>• Lower Development cost</li><li>• Evaluate multiple design concept</li><li>• Useful communication device</li><li>• Address screen layout issues</li><li>• Useful for identifying requirements</li></ul>	<ul style="list-style-type: none"><li>• Limited error checking</li><li>• Facilitator driven</li><li>• Limited utility after requirements established</li><li>• Navigational and flow limitations</li><li>• Poor detailed specifications to code</li></ul>
High-fidelity Prototypes	<ul style="list-style-type: none"><li>• Complete functionality</li><li>• Fully interactive</li><li>• User Driven</li><li>• Clear definition of navigation</li><li>• Look and feel of final product</li><li>• Use for explorations and tests</li></ul>	<ul style="list-style-type: none"><li>• More expensive to develop</li><li>• Time-consuming to create</li><li>• Not effective for requirements gathering</li></ul>

