# Examples of popular color schemes for UI design:

- Monochromatic: This scheme uses a single color with different shades and tints. It's a great option for creating a calm and elegant UI design.A popular choice with designers, monochromatic color schemes are formed using various tones and shades of one single color.
- Analogous: This scheme uses colors that are next to each other on the color wheel. It's a good choice for creating a harmonious and cohesive UI design.An analogous color scheme is formed of three colors that are located next to each other on the color wheel. Analogous color palettes are commonly used when no contrast is needed—for example, on the background of web pages or banners.
- Complementary: This scheme uses colors that are opposite each other on the color wheel. It's a great option for creating a striking and eye-catching UI design.Complementary color palettes are composed of colors that are placed in front of each other on the color wheel. While the name may suggest otherwise, complementary color palettes are actually the opposite of analogous and monochromatic color palettes, as they aim to produce contrast. For example, a red button on a blue background will stand out on any interface.
- Split-complementary: This scheme uses three colors: a main color, its complement, and the two colors on either side of its complement. It's a good choice for creating a balanced and visually interesting UI design.

Orange is energetic and warm. Some common associations with orange include creativity, enthusiasm, lightheartedness, and affordability.

Red is the color of blood, so it’s often associated with energy, war, danger, and power but also passion, desire, and love. Some common associations with red include action, adventure, aggression, and excitement.

Yellow evokes positivity, youth, joy, playfulness, sunshine, and warmth.

Pink evokes feelings of innocence and delicateness, gratitude, romance, softness, and appreciation.

Blue is perceived as authoritative, dependable, and trustworthy. Common associations with blue include calmness, serenity, confidence, dignity, and security.

Green is the color of nature. It symbolizes growth, freshness, serenity, money, health, and healing.

Black represents power, elegance, and authority. Common associations with black also include class, distinction, formality, mystery, secrecy, and seriousness.

## Some common UI design color conventions include:

- Using a dark color for text to ensure legibility
- Keeping light colors for backgrounds
- Using contrasting colors for accents (as mentioned above)
- Sticking to classic call-to-action colors—such as red for a warning sign

https://webaim.org/resources/contrastchecker/

https://accessible-colors.com/

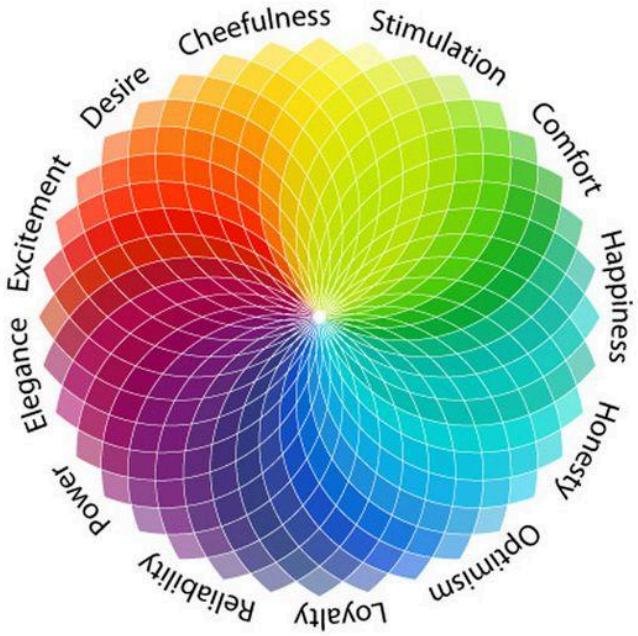
http://colorsafe.co/

https://color.adobe.com/create/color-wheel

https://coolors.co/

Adobe Illustrator Color Guide

**Colors ⇒>** Red represents passion, purple represents creativity and originality, and green represents growth and balance




## Luminosity contrast ratio contrast ratio of images and text meets a contrast ratio of at least 4.5 : 1

Minimum contrast has a ratio of 4.5 : 1. These background and text combinations are easier to read, even though they use light colors.

High contrast has a ratio of 16 :1. These designs are easy to read and use bolder colors for text that stand out on the backgrounds.

Maximum contrast has a ratio of 21 : 1. For the most contrast in your designs, like these, use black and white only.

⇒> Not sure where to start with your colors? Coolors has you covered! The Coolors website will generate complementary colors with a click of your space bar :
https://coolors.co/f46036-2e294e-1b998b-e71d36-c5d86d

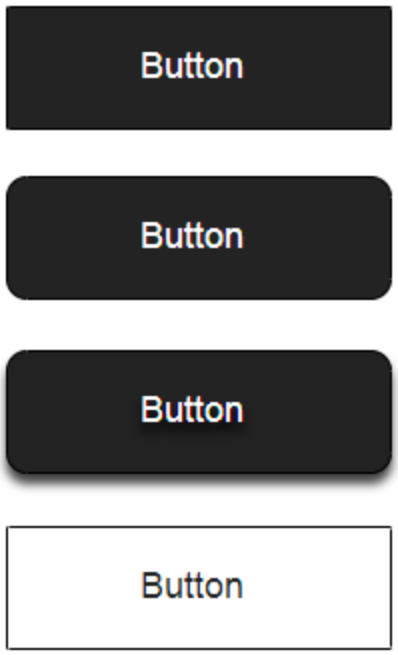
## Icons ⇒>

- Always have at least 1 cm x 1 cm minimum around the icon for legibility and easy tapping on mobiles.
- Use a single icon set and ensure that all your icons are consistent and cohesive.
- Always use labels for icons and show them to the right or below the icon.
- Be careful with "heart" and "star" icons. They can mean different things and often confuse users.
- Make icons distinct shapes and colors. This helps users recognize and recall them.
- Avoid using similar icons for different purposes or different icons for the same purpose. Click to Tweet
- When in doubt, remember the best icon is a text label.

## Few examples of buttons that are familiar to most users:

- Filled button with square borders
- Filled button with rounded corners
- Filled button with shadows
- Ghost button
- The “Filled button with shadows” design is the clearest for users.

## Button Design Examples ⇒>




⇒> While the 12-column grid is a popular choice among many designers . Many popular frameworks use a grid system of 12 equal-width columns. The number 12 is the most easily divisible among reasonably small numbers; it's possible to have 12, 6, 4, 3, 2 or 1 evenly spaced columns. This gives designers tremendous flexibility over a layout.

⇒> A grid column (not an ally) is where each block of content should begin and end. By breaking

elements out of the grid, you'll be highlighting them because the viewer will quickly see those breaks and be drawn to them.

⇒> A baseline grid can be used for horizontal alignment and hierarchy. Aligning UI design elements (text, images and content containers) to a baseline means you'll need to make their heights a multiple of the baseline value. For example, if you choose 8 pixels as a baseline value and want to align the text, you will need to make the line height of the typeface a multiple of the baseline value, which means the line height could be 8, 16, 24, 32, etc.

⇒> When designing for mobile, consider using a tile layout grid, in which the column and row heights are the same. This will give a look of square tiles across the design.when designing a grid layout, make images large enough to be recognizable yet small enough to allow more content to be seen at a time.

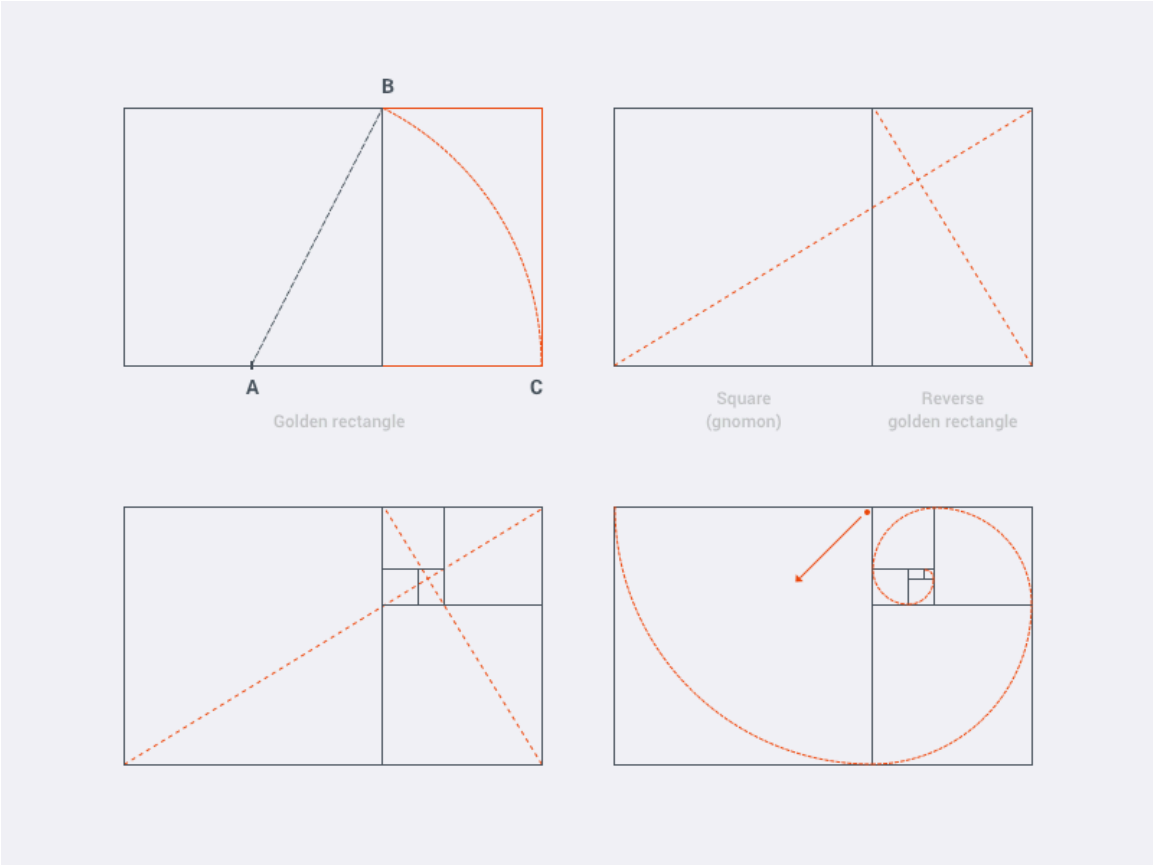
⇒> Divide the height of the heading by 2, that is the space between heading and body.

**Visual Hierarchy ⇒>** According to a report by Nielsen Norman Group, there are several common scanning patterns, such as the "F" or "Z" pattern, while people are browsing web pages. Users often read both of the head and bottom of the page carefully for searching for the core information from the left to the right. And as with the body contents, they will often scan the hierarchy (which consists of web tiles and subtitles) and choose useful parts only to read.And these scanning patterns require designers to place important or interesting contents with a good hierarchy in the head or bottom of the web page. And as with the body contents, you are also supposed to add attractive tiles and subtitles to create a compelling hierarchy. Western users use an F- and a Z-pattern.  Use a header to attract users' attention with the page/screen's core information, like a newspaper headline.Design guidelines suggest a ratio of 3:1 for headers to body text size.

**Accessibility ==>>** Never use light gray text on a dark gray background.Using formatting such as font weight or underline text style can also create prominence for hyperlinks.Use the Tab key to navigate and the Enter key to select items on your site. You should verify all interactive components have predictability and logical order. If a site can be used without a mouse, happy days!. Elements that require focus include hyperlinks, form fields, widgets, buttons, and menu/list items. The focus indication needs to differentiate itself from the other elements around it in context.The order of interactive elements as pages are navigated is essential and must be logical and intuitive , from left to right, top to bottom — header, main navigation, content buttons and inputs, and finally the footer. Recommended sizes of touch targets can vary, though they should be large enough to tap comfortably with one finger. For a device in hand, a good steer is to have a minimum interactive target area should be at least 7㎟, but ideally 10㎟. Summary as to how you can go about accessibility:

- Make accessibility part of your day to day activity
- Implement sufficient color contrast
- Use more than one variable to visually differentiate information
- Apply instructions on form fields and text inputs
- Make use of alternative text fields to describe information
- Use formatting to give information hierarchy and structure
- Interactive elements must be clearly distinguishable
- Support keyboard navigation
- Ensure interactive elements are large enough and in reach
- Test, test, and test again

**Golden Ratio ⇒>** The golden ratio is a mathematical proportion between the elements of different sizes which is thought to be the most aesthetically pleasing for human eyes. The golden ratio equals 1:1.618 and it is often illustrated with seashell-shaped spirals .




First, you need to decide the length of the small element. Then multiply it by a golden ratio which is 1.618 and the result will be the perfect length of the bigger element.Today the golden ratio is applied in various fields including architecture, art, photography, and design.Divide the layout into different sections using a proportion of 1:1.618 and put the content in the sectors according to their importance. To create efficient typography, designers need to divide copy content into different levels. They usually include various kinds of copy including headers, subheadings, body copy, caption etc. Applying golden ratio professionals can quickly define an appropriate proportion between the typographic levels, for example, you can choose a certain size for the header and then divide it by 1.618.

Many magazines use **serif fonts for article titles and sans serif fonts for body text. Serifs add flair to the titles that distinguish them from the rest of the content.**

Document your design choices in each case study. Whether you create a comprehensive design system with a bunch of elements or simply outline the icons and colors you frequently use, including a design system is a great way to spotlight your creative choices and enrich your portfolio.

**Design system ⇒>** In a nutshell, a design system is a collection of documents, articles, examples, code snippets, screenshots, design guidelines, components, philosophies and other digital assets for a product design company. It's usually hosted online as a website (public or internal). Think of it as a big knowledge-base that is part UI kit, part documentation with instructions, language and coding guidelines all wrapped up together.
A design system gets created in collaboration with an entire product team (programmers, engineers, designers, product managers, C-suite team etc.) Ideally, they come together as a committee to work on it; take inventory of all their current digital product assets (colors, logos, headers, footers, forms, code etc) and attempt to come to some consensus about how things ought to be designed, coded, presented and talked about.

**Atlassian Design System ⇒>** The style of this design system can inspire other similar collaboration and management tools you're working on such as team collaboration, product management tools, project management tools, team chats, help desks, knowledge-bases

**Uber Design System ⇒>** If you are in the working in the area of travel or transportation, gig economy or outer space; whether it be via scooter, career pigeon or bullet train, Uber is an amazing

example of how to tackle problems related to getting from point A to point regardless of where you want to go.

**Shopify Design System ⇒>** This design system itself is beautifully designed...take note.

**Mailchimp Design System ⇒>** If you're working on a project in the realm of email, marketing, business, strategy or ads, Mailchimp can provide some useful tips and examples of how to do it right while still pushing the boundaries of expression and creativity. There are many innovative design ideas to pull from and ways to make complex tasks (such as creating automated email campaigns and newsletters); normally relegated to power users, marketing gurus or tech savvy individuals, more accessible through approachable and intuitive UX.

**Salesforce Lightning Design System ⇒>** If you are working on content management systems, AI, sales, commerce or analytics platforms that focus heavily on user experience, interactions, and flows you would be wise to look towards the trailblazers themselves for inspirations and guiding principles.

**Helpscout Design System ⇒>** Great for your work involving help desks, ticket submission systems, knowledge-bases, FAQs, wikis and support forums.

**US Web Design Government Design System ⇒>** If you are working on a system that mostly focuses on forms, fields, inputs, tables white papers and links this is the system to refer to!

**Sound Style Guide ⇒>** A brand or design system uses a set of predetermined elements at every touchpoint that establishes consistency and cohesiveness in the user experience. Sound should be treated the same way as creating a style guide for a visual interface. Perhaps a product could use similar timbres for each tune, or incorporate natural sounds, such as water drops, windy whispers, and a sand rattle.

**UX Sounds ⇒>** A transition or micro-interaction sound should never last more than 0.3 seconds longer than its associated animation. A sound should be just short enough to be perceived by the user .

## How to Design Visual Cues for Better UX ⇒>

- **Arrows :** Perhaps the most obvious visual cue, arrows are very explicit about what you should do. They're also pervasive in everyday life off the web — think of road signs, for example. That's what makes them ideal in web design
- **Eyes (line of sight)** : When we talk about social cues, the gaze of one's eyes is a widely ingrained cue. Think about it. If you're talking to people in front of you, and then their eyes suddenly gaze to a point behind you, you're immediately curious about what they're looking at that you can't see. Distracted, you'll likely turn your head to see what all the fuss is about.
- **There are two types of cues that performed the best:** A hand-drawn arrow pointing at a page element (in this case, a form). A human looking right at the form.

**Priority Zero (P0)** , An insight like this must be resolved for the project to work. For example, were there any parts of the user flow that prevented the user from completing their task? A roadblock this significant would be considered a P0. Another example of a P0 would be if any part of the user flow made the user feel tricked or misled. For example, the user could have purchased an item online, but there was no confirmation that their payment was successfully submitted. This lack of confirmation might confuse the user as to whether or not their order went through. If any part of your project was inaccessible or difficult to access by a user. It is essential that our designs are accessible to people of all abilities, backgrounds, and experiences.

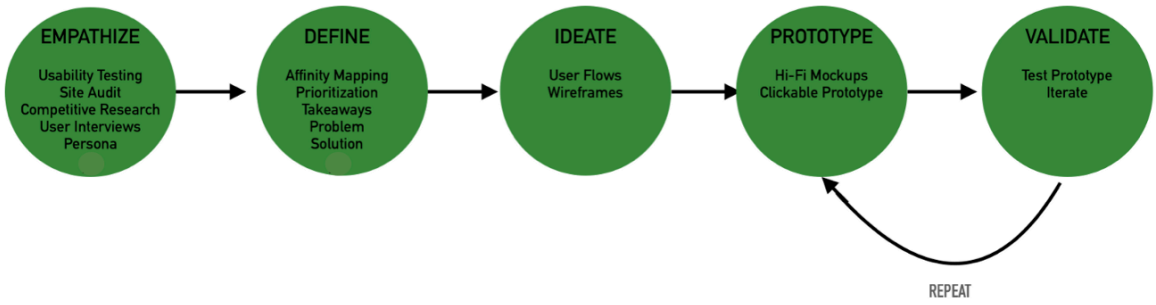
**Priority One (P1) ,** the lack of the feature does not prevent the user from accomplishing their primary task, so it does not fall into the P0 bucket. This would make a great P1 insight, where it can be added to a prototype to be tested in a future research study.

**Priority Two (P2) ,** This would be an insight that could wait to be addressed after all the P0 and P1 insights have been taken care of. These insights might make more sense to address in a later sprint of the project.

**Note ⇒>** Ask yourself, "Has anyone else implemented a solution to this problem, and the user

tested the said implementation already?”. If yes it might be possible to re-use the same principles in your design and by doing so, save time for yourself and money for the company you work for.

## IDEO’s human centered design process ⇒>



## Common website layouts ⇒> Single column layout ,Multicolumn layout,Box layout,Featured image layout ,Asymmetrical layouts,Grid of cards layout,Tiered layer cake layout

- **Single column layout ⇒> Single column layout allows for easy scrolling on mobile phones.** This layout is especially good for emphasizing one main element on a page, like a logo, a video, or an entire block of text.
- **Multicolumn layout ⇒>** The multicolumn layout has two or more columns for content.When you're designing a responsive website in this course, the mobile phone sized version of your website might use a single column layout, while the desktop sized version might use a multicolumn layout since there's more space to add elements.. On many multicolumn websites, one column of content on the far left or right is used for ad space.
- **Box layout ⇒>** The box layout consists of boxes or squares of various sizes and proportions. This layout is typically found on homepages of websites and is a great way to organize multiple elements.You might also use a box layout on your portfolio website to showcase images of your designs from different projects!
- **Featured image layout ⇒>** The featured image layout places the user’s focus on a single image or video that often takes up the entirety of the page. Because of this, the featured image layout is often referred to as a single image layout.The featured image layout is often accompanied by a fixed or “sticky” top navigation bar that stays in place as users scroll down the page.
- **Asymmetrical layouts ⇒>** Asymmetrical layouts are purposefully imbalanced between different sides of a page to draw emphasis. This website layout can be useful to highlight certain design elements, like images or text headlines, or to divide content by order of importance.The success of asymmetrical layouts relies on natural eye-tracking patterns. An eye-tracking pattern describes the way in which users with typical vision follow content down the page of a website. Two common asymmetrical eye-tracking patterns are F-shape and Z-shape.
- **F-shape eye-tracking pattern ⇒>** An F-shape eye-tracking pattern means that users will likely browse content on the page following the shape of the letter F. Laying out the page of a website following the F-shape eye-tracking pattern is useful when presenting lots of material, like text, since users scan information based on hierarchy.
- **Grid of cards layout ⇒>** A grid of cards layout features a series of cards that provide previews of more detailed content. A card is a rectangular shape that includes short, related information. Think of it like a playing card's shape and size, but in a digital design!
- **Tiered layer cake layout ⇒>** A tiered layer cake layout has individual rows, or layers, that are stacked on top of one another. Within each row, there can be different numbers of columns, and they don’t have to be consistent.

**Z-shape eye-tracking pattern ⇒>** A Z-shape eye-tracking pattern means that users will likely browse content on the page following the shape of the letter Z, for users who read from left to right. A website layout following this natural pattern draws the user's eyes to all of the information on the site, based on the order of importance.

***Eye-tracking pattern ⇒>*** *An eye-tracking pattern describes the way in which users with typical vision follow content down the page of a website. Two common asymmetrical eye-tracking patterns are F-shape and Z-shape.*

**Headlines ⇒>** Make headlines at least 1.6 times bigger than body text.

# Three Major Principles of Responsive Design ⇒> Fluid Grid Systems , Fluid Image Use , Media Queries

- **Fluid Grid System** ⇒> Let's take a look at an example of how this works, using a mathematical formula:
  Target size / context = relative size
  So let's say you're working on a website with a wrapper that is designed to display the site at a maximum width of 960 pixels and the device uses a maximum browser window width of 1280 pixels.The 960 pixels is our target size. The context is 1280 pixels. So:
  960/1280 = 75%

- **Fluid Images** ⇒> The use of SVG files can make this easier as they are the smallest image files and can usually be scaled to any resolution.The easiest way to handle fluid images (images that scale to fit their container) is using the CSS command: img { max-width: 100%;}
  You can declare multiple sources for an image using the picture element:

  Combined with the srcset and sizes attributes to provide the list of image sources and sizes to allow a browser to select the best image:

- **Media Queries** ⇒> Media queries are designed to alter the layout of the site when certain conditions are met.The idea is that you can then use a media query to specify when the screen real estate should be rearranged. You will find that this works best with a "mobile first" approach where you define what you want on mobile and then scale up from there.The CSS might look like this:
  @media screen and (min-width: 480px) { /* ..larger screen sizes here.. */ }

**Fitts's law** is a psychological law that states that the time it takes to move a pointer to a target is a function of the distance to the target and the width of the target. The law was first proposed by Paul Fitts in 1954, and it has been widely used in the field of interaction design to improve the usability of user interfaces.The mathematical formula for Fitts's law is: $t = a + b \log_2 (2d/w)$

where:

- t = time to move the pointer to the target
- a and b = constants that are specific to the user and the device being used
- d = distance between the starting point and the target
- w = width of the target

As you can see from the formula, the time it takes to move the pointer to the target increases as the distance to the target increases and as the width of the target decreases. This is because it takes longer for the user's motor system to make a precise movement when the target is small or far away. Fitts's law can be used to optimize the design of user interfaces in a number of ways. For example, designers can:

- Make targets larger and closer together to reduce the time it takes for users to select them.
- Group related targets together to make it easier for users to find them.
- Use visual cues to highlight important targets.
- Use a consistent layout for all user interfaces to make them easier to learn and use.

# Examples of how Fitts's law can be applied to interaction design:

- A button to complete an action should be placed close to the active elements on the screen. This will reduce the distance that the user has to move their cursor, and it will also make the button easier to find.
- Important elements in a user interface, such as search bars and navigation menus, should be made larger so that they are easier to select. This is especially important for users with disabilities or limited dexterity.
- Interactive lists should be as short as possible. This will reduce the time it takes for users to scroll through the list and find the item they are looking for.

# Interaction design principles :

- Visibility: The design should make it clear to users what they can do and what the consequences of their actions will be. This can be achieved through clear labeling, consistent visual cues, and feedback.
- Learnability: The design should be easy to learn and use, even for first-time users. This can be achieved by using simple language, clear instructions, and progressive disclosure.
- Memorability: The design should be memorable so that users can easily return to it and complete tasks without having to relearn everything. This can be achieved by using familiar patterns, consistent terminology, and meaningful visual cues.
- Efficiency: The design should be efficient so that users can complete tasks quickly and easily. This can be achieved by reducing unnecessary steps, providing shortcuts, and optimizing the layout of the interface.
- Error tolerance: The design should be forgiving of errors so that users don't get stuck or frustrated. This can be achieved by providing clear error messages, allowing users to undo actions, and providing multiple ways to complete tasks.
- User control: The design should give users control over their experience. This can be achieved by providing users with options, allowing them to customize the interface, and giving them feedback on their actions.
- Engagement: The design should be engaging so that users want to use it. This can be achieved by using fun and interactive elements, providing rewards for completing tasks, and making the interface visually appealing.
- Consistency: The design should be consistent throughout the interface. This means using the same terminology, visual cues, and interaction patterns throughout.
- Perceived affordance: The design should make it clear to users what they can interact with. This can be achieved through clear labeling, appropriate graphical elements, and context-sensitive feedback.
- Feedback: The design should provide clear feedback to users about their actions. This can be achieved through visual cues, auditory cues, and text-based feedback.
- Flexibility: The design should be flexible enough to accommodate a variety of users and tasks. This can be achieved through customizable options, multiple views, and support for different input devices.
- Accessibility: The design should be accessible to users with disabilities. This can be achieved through features such as keyboard navigation, screen readers, and high contrast modes.

# Principles when designing interaction for mobile apps:

- Keep it simple. Mobile users are often on the go and have limited attention spans. Make sure your app's interface is easy to understand and use.
- Use large touch targets. Users will be interacting with your app using their fingers, so make sure the touch targets are large enough to hit easily.
- Reduce clutter. Don't overload the user with too much information or too many options. Focus on the most important elements and make sure they are easy to find.
- Use clear and concise language. Users should be able to understand what your app is doing and how to use it without having to read a lot of text.
- Use consistent design elements. This will help users learn how to interact with your app more quickly.
- Use animations and transitions to create a more engaging experience. Animations and transitions can help to make your app more visually appealing and engaging.
- Device size and orientation. Mobile devices come in a variety of sizes and shapes, so make sure your app's design adapts to different screen sizes and orientations.
- Touch input. Users will be interacting with your app using their fingers, so make sure the touch controls are easy to use and responsive.
- Gestures. Many mobile devices support gestures, such as swiping, pinching, and rotating. Use gestures to make your app more interactive and engaging.
- Haptics. Some mobile devices support haptic feedback, which can be used to provide users with a more tactile experience. Use haptic feedback to enhance the user experience of your app.

# Interaction design guidelines:

- Visibility of system status: Users should always be informed of what is happening in the system, through appropriate feedback within a reasonable amount of time. This includes things like showing the current state of the system, providing error messages, and indicating when actions have been completed.
- Match between system and the real world: The system should be designed in a way that is consistent with the user's mental model of the world. This means using familiar terminology, icons, and metaphors. For example, a map app should use icons that are recognizable to users as representing different types of landmarks.
- User control and freedom: Users should have control over the system and be able to freely explore and experiment. This means providing clear and concise instructions, as well as allowing users to undo actions and change their minds.
- Consistency and standards: The system should be consistent in its use of terminology, icons, and interactions. This makes it easier for users to learn and remember how to use the system.
- Error prevention: The system should be designed to prevent errors from happening in the first place. This can be done by providing clear instructions, using forgiving input validation, and providing warnings when users are about to make a mistake.
- Recognition rather than recall: Users should be able to recognize what they need to do, rather than having to remember it. This can be done by using clear and concise instructions, as well as providing visual cues.
- Flexibility and efficiency of use: The system should be flexible enough to accommodate different user needs and preferences. It should also be efficient to use, so that users can get their tasks done quickly and easily.
- Aesthetic and minimalist design: The system should be aesthetically pleasing and easy to look at. It should also be minimalist, with only the essential elements included.
- Help users recognize, diagnose, and recover from errors: When errors do happen, the system should help users to recognize the error, diagnose the problem, and recover from the error. This can be done by providing clear and concise error messages, as well as providing suggestions for how to fix the problem.
- Help and documentation: The system should provide clear and concise help and documentation. This can be done in a variety of ways, such as providing in-app help, creating a user manual, or providing online documentation.

# UI design color theory best practices:

- Use a limited color palette. Too many colors can be overwhelming and distracting. A good rule of thumb is to use no more than 3-5 colors in your entire UI design.
- Choose colors that are relevant to your brand. Your brand colors should be used throughout your UI design to create a cohesive and recognizable look.
- Consider the emotional impact of colors. Different colors evoke different emotions in people. For example, red is often associated with excitement and passion, while blue is associated with calmness and trust. Use colors strategically to create the desired emotional response in your users.
- Use contrast to create hierarchy and focus. Contrasting colors help to make certain elements of your UI design stand out, such as buttons, text, and images. Use a light color on a dark background or vice versa to create a strong contrast.
- Use color to guide the user's eye. You can use color to lead the user's eye to important information or elements of your UI design. For example, you can use a bright color to highlight a call to action button or use a light color to create a focal point in a busy layout.
- Test your color palette with users. Once you've chosen a color palette, it's important to test it with users to make sure it's effective. Ask users for their feedback on the colors, such as whether they find them easy to read, understand, and remember.

# Color Theory :

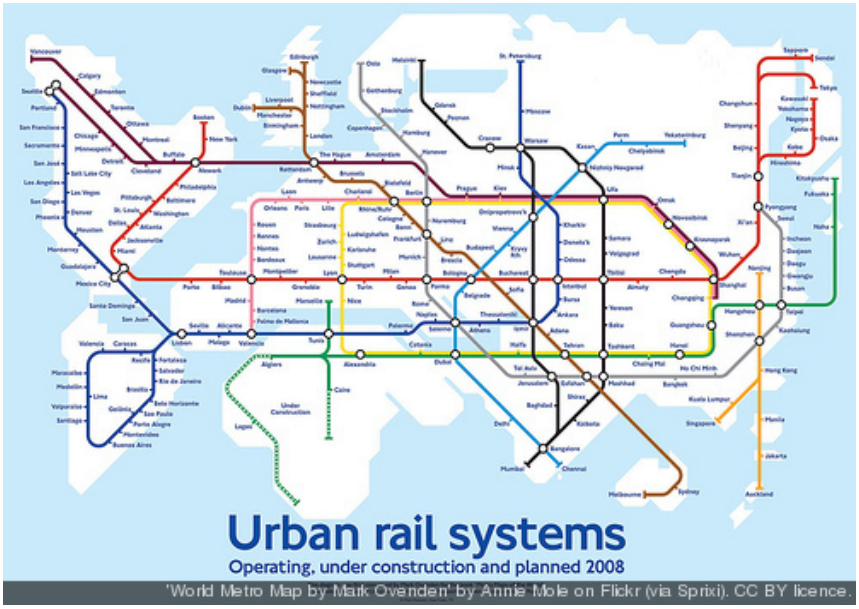
- The color wheel is a circle of colors that shows the relationships between different hues. The primary colors are red, yellow, and blue. When mixed together, these colors create the secondary colors: orange, green, and purple. Tertiary colors are created by mixing a primary color with a secondary color.
- Color harmony is the way that colors are arranged together to create a pleasing effect. There are many different types of color harmony, but some of the most common include:
    - Complementary colors are colors that are opposite each other on the color wheel. They create a high-contrast effect that can be very striking.
    - Analogous colors are colors that are next to each other on the color wheel. They create a more subtle and harmonious effect.
    - Triadic colors are three colors that are evenly spaced around the color wheel. They create a balanced and visually interesting effect.
    - Tetradic colors are four colors that are evenly spaced around the color wheel. They can be very dynamic and eye-catching, but they can also be overwhelming if not used carefully.
- Color temperature refers to the warmth or coolness of a color. Warm colors, such as red, orange, and yellow, are associated with fire and the sun, while cool colors, such as blue, green, and purple, are associated with water and the sky.
- Hue is the name of a color, such as red, blue, or green.
- Saturation is the purity of a color. A highly saturated color is very bright and vivid, while a low-saturation color is more muted and pastel.
- Value is the lightness or darkness of a color. A high-value color is light and bright, while a low-value color is dark and muted.
- Use color to create a mood or atmosphere. For example, warm colors can create a sense of excitement or energy, while cool colors can create a sense of calm or peace.
- Use color to draw attention to certain elements of your design. For example, you can use a bright color to highlight a call to action button or a logo.
- Use color to create balance and harmony in your design. For example, you can use complementary colors to create a sense of contrast, or you can use analogous colors to create a more subtle and harmonious effect.
- Experiment with different color combinations until you find something that you like. There are no right or wrong answers when it comes to color, so have fun and be creative!

**Value Proposition Canvas ⇒>** Value Proposition Canvas is a strategic tool that helps businesses understand and articulate the value they offer to their customers. It is a visual framework that can be used to map out the customer's needs, pains, and gains, and how the business's products and services address them. A value proposition is a short statement that communicates why buyers should choose your products or services. It's more than just a product or service description — it's the specific solution that your business provides and the promise of value that a customer can expect you to deliver.

## The Only Five Ways to Organize Information (Five Hat Racks or LATCH) ⇒>

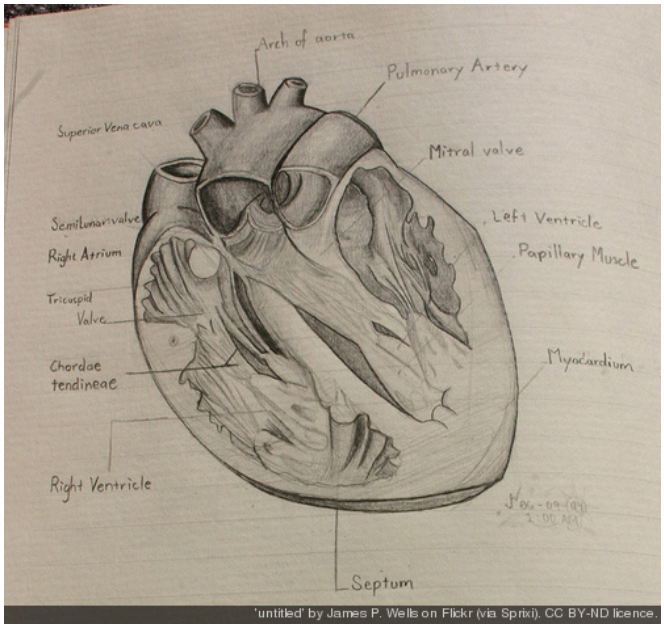
Richard Saul Wurman came up with a handy acronym that I like to use to remember the five ways to categorize: **LATCH — Location, Alphabet, Time, Category, and Hierarchy.** That's it. Whenever you face the need to organize (whether it be anything from representing human anatomy to creating a budget), you'll want to think of these five methods and choose the best one (or, you might choose multiple).

**Location ⇒> You can organize information by showing a visual depiction of a physical space. Maps are really common ways to organize by location (think about shopping mall directories or college campus maps). You might also show a diagram of, say, the human brain and where the hypothalamus is in relation to the cerebellum. Whatever your reason, organizing by location usually requires some sort of visualization of an area or place.**



'World Metro Map by Mark Ovenden' by Annie Mole on Flickr (via Sprixi). CC BY licence.

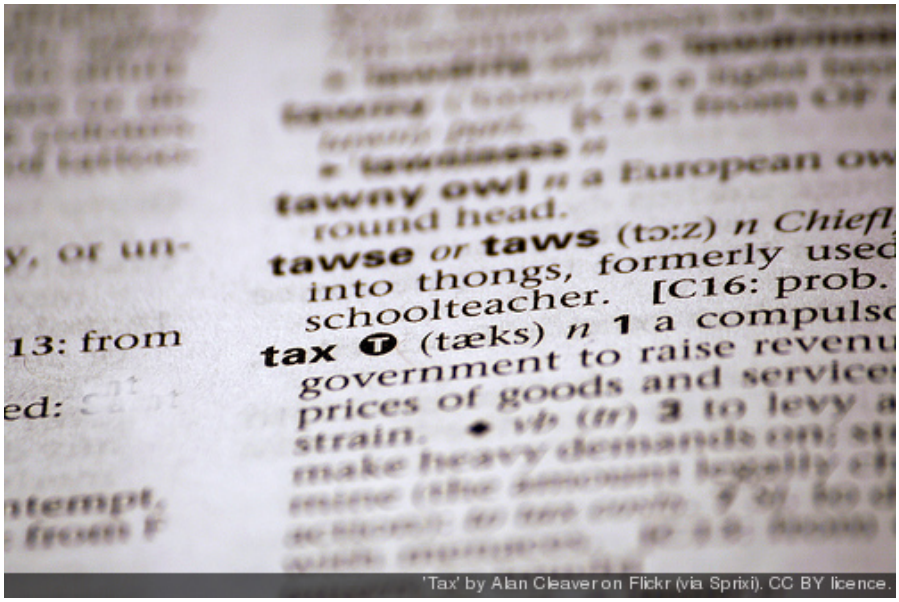
**Organize by location: map**



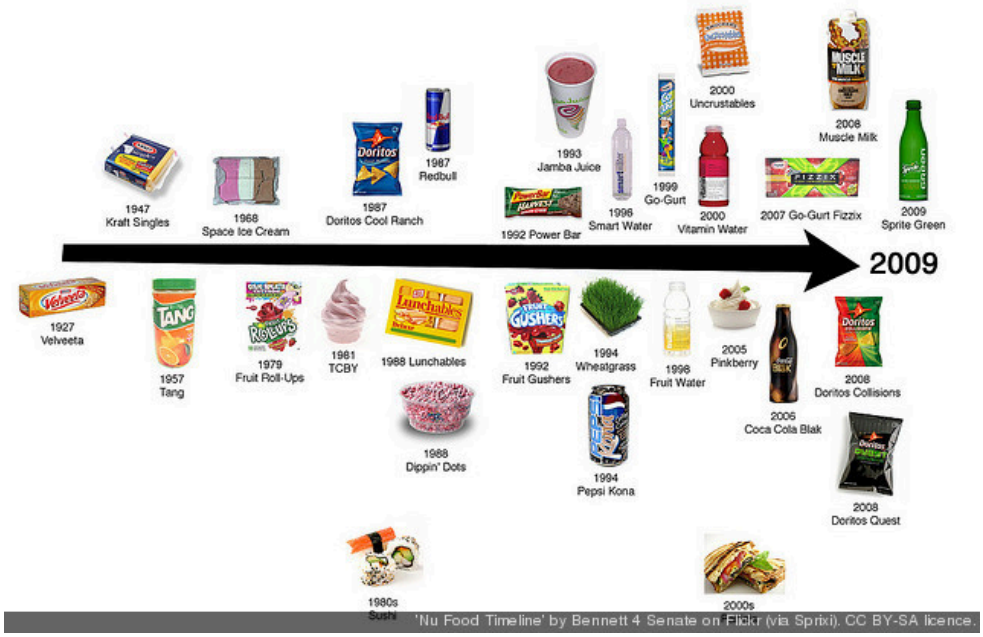
'untitled' by James P. Wells on Flickr (via Sprixi). CC BY-ND licence.

**Organize by location: diagram**

**Alphabet ⇒>** Organizing information alphabetically works really well when people know specific terms and topics they are looking for. The key is that the reader/viewer knows the terms and they have something to look up (like in the index in the back of a textbook or in a dictionary). But if a person wants to learn biology but doesn't know the names of the parts of a cell, the alphabet won't work out so well. There is a problematic default on website organization to put long menus in alphabetical order. If the terms you use don't make a lot of sense to a viewer, alphabetical order won't be helpful. Alphabetical order works well for fiction novels (by author last name) but not for non-fiction reference books (which use the Dewey-Decimal system).



**Time ⇒>** Organizing information by time is useful for finding information in a chronological pattern (like the history of humankind's most influential inventions) or by the months or years in which events happen. Time is also good for showing how things happen over a fixed duration of time. Consider a flow chart that describes a process, like how chicken nuggets are made, from beginning to end of cycle. Organizing by time can tell a very different story about information than organization by another method. See the image below, which is organized by time. If it were organized by category, the information would mean something completely different to the person looking at it.

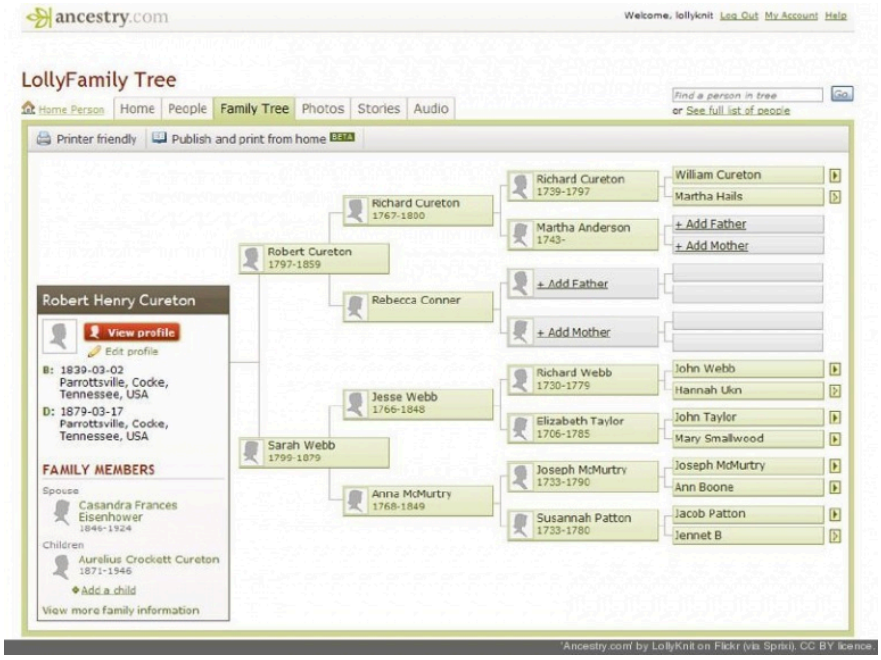


'Nu Food Timeline' by Bennett 4 Senate on Flickr (via Sprixi), CC BY-SA licence. Organize by Time: Timeline of Products

**Category ⇒>** Perhaps the broadest of the five ways to organize information, categories are useful for a number of purposes, like describing different animal types or organizing a grocery store. Image how differently the information about the foods above would appear if they were organized by category instead of time. You can use categories to organize information in just about any way imaginable, whether it be by color, shape, gender, model, price, or anything else.

Organize by Category: Jell-O Section

**Hierarchy ⇒>** Hierarchies are useful when showing how one piece of information is connected to another in order of importance or rank. Hierarchies are used in organizational charts to show who reports to whom. Hierarchy is also used to show scale, like biggest to smallest or heaviest to lightest.



Organize by Hierarchy: Family Tree

**information architecture ⇒> The practice of information architecture is the effort of organizing and relating information in a way that simplifies how people navigate and use information on the Web.**

**Six Thinking Hats -** It is a discussion framework that defines six metaphorical hats which represent different modes of thinking, therefore enabling participants in a group to think and discuss ideas together effectively. A set time interval is used for each hat, allowing participants to have a focused discussion of each idea :

| | |
|---|---|
|  | The White Hat calls for information known or needed. "The facts, just the facts." |
|  | The Yellow Hat symbolizes brightness and optimism. Under this hat you explore the positives and probe for value and benefit. |
|  | The Black Hat is judgment - the devil's advocate or why something may not work. Spot the difficulties and dangers; where things might go wrong. Probably the most powerful and useful of the Hats but a problem if overused. |
|  | The Red Hat signifies feelings, hunches and intuition. When using this hat you can express emotions and feelings and share fears, likes, dislikes, loves, and hates. |
|  | The Green Hat focuses on creativity; the possibilities, alternatives, and new ideas. It's an opportunity to express new concepts and new perceptions. |
|  | The Blue Hat is used to manage the thinking process. It's the control mechanism that ensures the Six Thinking Hats® guidelines are observed. |

**SCAMPER ⇒>** SCAMPER Technique is a team brainstorming technique used to develop or improve products or services. SCAMPER is a method of creative brainstorming that can improve or innovate products that are not performing well in the market.**SCAMPER technique is an idea generation method that takes an existing idea, and applies a series of transformations to it.** SCAMPER is an acronym for Substitute, Combine, Adapt, Modify/Magnify, Purpose, Eliminate/Minimize and Rearrange/Reverse :

- Substitute: What can be replaced? (for example, components, materials, people)
    - Example: if you were making windows for a children's playhouse, you might substitute glass with plastic (for safety).
- Combine: What can be combined? (for example, other features, devices)
    - Example: cell phones have combined phone features with cameras.
- Adapt: What can be added? (such as new elements or functions)
    - Example: cars now have built-in wifi.
- Modify, Magnify, maximize, minimize: What can be modified? (for example, change the size, shape, color, or other attribute)
    - Example: sunglasses reduced in size for babies or small children.
- Put to other use (purpose): Could you put the product to a different use, or use it in another industry?
    - Example: during COVID19 pandemic, coffee filters being used as filters in masks for faces.
- Eliminate or minimize: What can be removed or simplified?
    - Example: removing cigarette lighters from cars (to be able to use the space for charging devices?).
- Reverse, reengineer, or rearrange: What would happen if you reversed the product's production process? What can be swapped or flipped?
    - Example: fast food restaurants rearranged the typical eat then pay model to pay then eat.

## Ideation Techniques - **Brainstorm , Braindump , Brainwrite**

**Brainwalk , Worst Possible Idea , Challenge Assumptions , Mindmap , Sketch or Sketch Storm , Storyboard , Bodystorm , Analogies , Provocation , SCAMPER , Movement , Gamestorming , Cheatstorm , Crowdstorm , Co-Creation Workshops , Creative Pause**

**Braindump -** Braindump is very similar to Brainstorm, however it's done individually. The participants write down their ideas on post-it notes and share their ideas later with the group.

**Brainwrite -** Brainwriting is also very similar to a Brainstorm session. However, the participants write down their ideas on paper and, after a few minutes, they pass on their own piece of paper to another participant who'll then elaborate on the first person's ideas and so forth. Another few minutes later, the individual participants will again pass their papers on to someone else and so the process continues. After about 15 minutes, you will collect the papers and post them for instant discussion.**Brainwriting is very similar to a Brainstorm session. However, the participants write down their ideas and then after a few minutes they pass on their own paper to another participant who'll then elaborate on the first person's ideas and so forth.**

**Brainwalk -** Brainwalk is similar to Brainwriting. However, instead of passing around the paper, the participants walk around in the room and continuously find new "ideation stations" where they can elaborate on other participants' ideas.

**Worst Possible Idea -** Worst Possible Idea is a highly effective method that you can use to get the creative juices flowing and help those who are not so confident in expressing themselves by flipping the brainstorm on its head. It's a lot of fun too. Instead of going for good ideas and putting the pressure on, call for the worst possible ideas your team can come up with. Doing this relieves any anxiety and self-confidence issues and allows people to be more playful and adventurous, as they know their ideas are most certainly not going to be scrutinized for missing the mark. It's way easier to say, "hey, no that's not bad enough" than the opposite. A great variation of this called the bad ideas method encourages you to generate a large quantity of bad ideas.

**Challenge Assumptions -** Take a step back from the challenge you're tackling and ask some important questions about the assumptions you have about the product, service, or situation where you're trying to innovate. It is particularly effective to challenge assumptions when you are stuck in current thinking paradigms or have run out of ideas. Therefore, it is good for rebooting a flagging session. Are the characteristics we take for granted about these things really crucial aspects, or are they just so because we've all become accustomed to them?

**Sketch or Sketchstorm -** Throughout ideation sessions, a valuable exercise is to express ideas and potential solutions in the form of diagrams and rough sketches instead of merely in words. Visuals have a way of provoking further ideas and providing a wider lens of thinking. The idea with sketching out ideas is not to develop beautiful drawings worthy of framing and mounting on the wall. The sketches should be as simple and rough as possible with just enough detail to convey meaning. This also helps prevent people from becoming attached to their little works of art.

**Storyboard -** Stories are a key medium for communication, learning, and exploring. Storyboarding is all about developing a visual story relating to the problem, design, or solution which you want to explain or explore. Storyboarding can help you bring a situation to life, it can show what happens over time, and explore the dynamics of a situation. You can use storyboarding after having empathized with people in order to better understand their lives. You can draw out their stories. Storyboards can help you represent information you gain during research. Create scenarios consisting of pictures and quotes from users. If you are developing ideas, you may then seek to play with different scenarios to see where they go. Develop a coherent storyline with actors and a plot. Try to build tension and include unexpected surprises in your story. Evoke emotions and show struggle and by the end learning and solving the tensions and leaving the user satisfied.

**Bodystorm -** Bodystorming is a technique in which participants physically act out situations they are trying to innovate within. It may involve expressing solutions to ideas through physical activity, or enacting some of the problem scenarios that we are attempting to solve. Physically acting out processes, scenarios and events helps get the ideation team physically involved instead of theorizing about the problems.

**Analogies -** Storytellers, journalists, artists, leaders and all kinds of other creative professions have relied on creating analogies as a powerful tool for communicating and sparking ideas. An analogy is a comparison between two things for instance a comparison of a heart and a pump. We communicate using analogies all the time as they allow us to express our ideas or to explain complex matters in an understandable and motivating way.

**Provocation -** Provocation is a lateral thinking technique, which challenges the status quo and allows you to explore new realities to extreme degrees. Lateral thinking distances itself from the classic method for problem solving where we work out the solution step-by-step from the given data.

**SCAMPER -** SCAMPER is a lateral ideation technique that utilizes action verbs as stimuli. It helps us ask seven kinds of questions to come up with ideas either for improvements of existing products or for making a new product.

**Movement -** The movement technique will also help you if you're blocked in your idea generation. You can use this technique to step around the roadblocks in your thinking. The Provocation technique Movement will help you force your team to question the status quo, shock yourself and your team into a new reality. This is the perfect "what if?" tool .

**Gamestorming -** Gamestorming is a set of ideation and problem-solving methods that are purposely gamified in order to dramatically increase levels of engagement, energy, and collaboration during group sessions A few examples of gamified ideation sessions include:

**Fishbowl:** An ideation session in which participants sit in two circles, one smaller and one larger surrounding the smaller one. Participants in the inner circle discuss their ideas and brainstorm while participants in the outer circle listen, observe, and document the ideas and conversation points without saying anything. This forces some to listen and others to engage in brainstorming.

**The Anti-Problem:** The idea is based on flipping the problem. The Anti-Problem is the opposite of the real problem that needs to be solved. In this session you seek to solve the anti-problem. This may provide

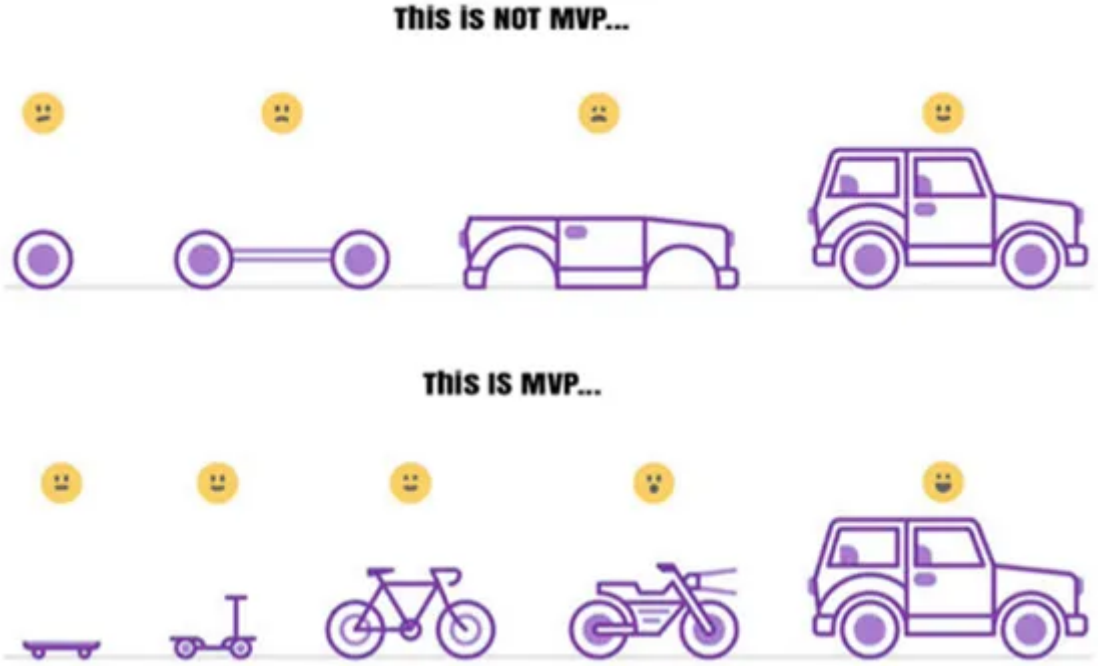
inspiration that you could not have gotten access to by focusing purely on the real challenge, though it may generate ideas which are still related to the problem space. The ideas you generate can then be re-flipped to bring them back into the realm of the real problem.
**Cover Story:** This involves using a template that forces participants to create a cover story, including main image, headline, quotes, and sidebars with associated facts etc. It is a good method for vision generation sessions and helps create a cohesive picture of a broad subject area using the primary characteristics.

**Crowdstorm -** Another storm to consider involves the target audience to generate or comment and approve generated ideas. Customer or user feedback is important at every stage of the process and involving them to pick and evaluate ideas can lead to identifying possible winners or losers, which the team might have missed due to blind spots.

**Co-Creation Workshops -** Co-creation or Co-design workshops combine a number of Design Thinking methods over the course of a few hours to days or even weeks. They can be condensed into full day workshops and conducted a number of times at different locations in order to expedite findings and ideas from the target community.

**Creative Pause -** When our neurons are firing away against a seemingly impenetrable brick wall challenge, we can easily get stuck into unconstructive thinking patterns. We become anchored to an early idea or stream of thought, or get caught up in negative thoughts surrounding the process. **A creative pause gives us time to take a step back, reflect, extract ourselves from the traps we've cognitively set for ourselves, and re-approach the challenge with renewed freshness of the mind. We want proactive thinking to lead the way – not reactive thinking, which often has a negative orientated spin to it.**

**Lean Startup Methodology -** The first step is figuring out the problem that needs to be solved and then developing a minimum viable product (MVP) to begin the process of learning as quickly as possible.Ask questions like "Should this product be built?" and "Can we build a sustainable business around this set of products and services?"




**JTBD(Jobs to be done) - JTBD** focuses on what users are trying to accomplish by using our product. It empathizes more on actions (features).

**Lewin's equation -** Lewin's equation, B = $f$(P, E), is a simple but powerful formula that explains human behavior. It states that behavior (B) is a function ($f$) of the person (P) and their environment (E).

- Person (P) includes all of the individual's internal factors, such as their personality, values, beliefs, attitudes, motivations, and abilities.
- Environment (E) includes all of the external factors that influence the individual, such as their physical surroundings, social relationships, and cultural context.

Lewin's equation emphasizes that behavior is not simply a product of the person or the environment alone, but rather a complex interaction between the two. For example, the same person may behave differently in different environments, and the same environment may have different effects on different people.

**Lewin's equation - Explanation :** Lewin's equation has been used to explain a wide range of social psychological phenomena, including:

- Conformity: Why people tend to conform to the expectations of their social group.
- Aggression: Why people become aggressive in certain situations.
- Prejudice: Why people develop prejudice against others.
- Altruism: Why people help others, even when it is not in their own best interest.

**Lewin's Equation, B=$f$(P,E) - Conclusion : Lewin's Equation states that Behavior is a function of the Person and his or her environment.**

## Lewin's equation examples of how Lewin's equation can be applied to social psychology :

- A person who is shy and introverted (P) may be more likely to withdraw from social situations in a large group (E), but may be more outgoing and talkative in a small group (E).
- A person who is competitive (P) may be more likely to be aggressive in a competitive environment (E), such as a sports game, but may be more cooperative in a non-competitive environment (E), such as a work team.
- A person who is prejudiced against a certain group of people (P) may be more likely to behave aggressively towards them (B) if they are in a situation where they feel threatened by that group (E).
- A person who is altruistic (P) may be more likely to help someone in need (B), even if it is not in their own best interest (E).

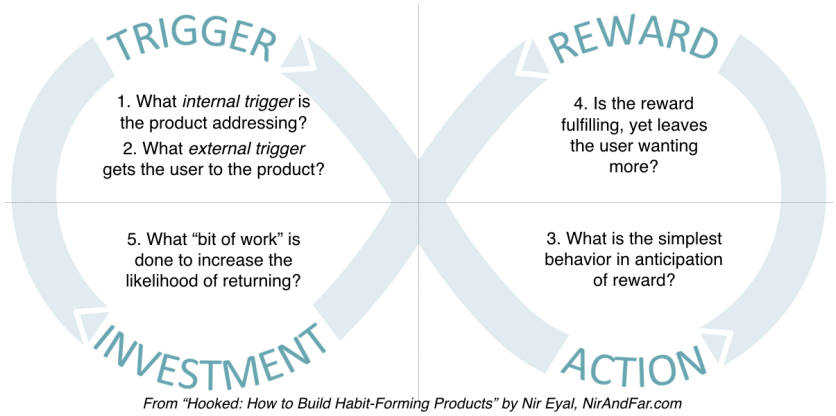
**Fogg Behavior Model-** It's a user-centered framework for developing software and apps. It tries to let the user's emotions and needs guide the overall development process while presenting triggers to get the user to make a certain action. Essentially, it follows the formula:

**User's behavior = Ability + Motivation + Trigger**

**Hooked model canvas** explains the flow from **triggers** to **action**, **rewards**, and **investment**. The experience is designed to connect the user's problem to the created solution frequently enough to form a habit.

1. **Trigger** (External or Internal): This is the actuator of behavior. It cues the action that then builds a habit.
2. **Action:** Behavior executed in anticipation of the reward. **Actions** are what you're looking to turn into a habit. Actions are where BJ Fogg's behavioral model (**B = M + A + T**) comes into play.
3. **Reward:** Simple behaviors such as scrolling, searching, or clicking play result in "**rewards**" for users. The reward, however, is not always the most important part. The brain is most active when it is *anticipating* the reward.
4. **Investment:** The final step in the hook is "**investment.**" It's easy to think that once a goal is accomplished, your job as a designer is done. However, you want your users to form habits and keep coming back!

**The Hooked Model** *Canvas*




*From "Hooked: How to Build Habit-Forming Products" by Nir Eyal, NirAndFar.com*

**Fitts's Law -** This law *states that the time it takes someone to select an object depends on how far they are from the object and the size of the object. Make sure the target action is always easily accessible to the user — both in terms of the distance the user has to travel and the target's size. According to this design law by psychologist Paul Fitts, a design's usability increases by making sure the interactive element is:*

- Large enough for users to select it easily
- Separate from other elements in the interface (larger in size and differently colored, for instance)
- Clickable anywhere so it's easy to carry out the action and within a user's reach so they have to do minimal work.

**Jakob's Law -** *Users spend most of their time on other sites, and they prefer your site to work the same way as all the other sites they already know.*

1. Users will transfer expectations they have built around one familiar product to another that appears similar.
2. By leveraging existing mental models, we can create superior user experiences in which the users can focus on their tasks rather than on learning new models.
3. When making changes, minimize discord by empowering users to continue using a familiar version for a limited time.

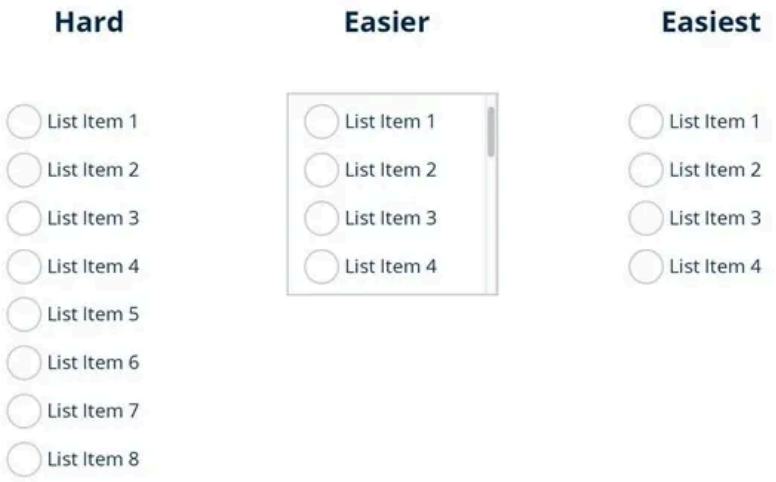
**Miller's Law -** *The average person can hold only 7 (plus or minus 2) items in their working memory.* Miller's Law *teaches us to use chunking to organize content into smaller clusters to help users process, understand, and memorize easily. Take away-*

- *Don't use the "magical number seven" to justify unnecessary design limitations.*
- *Organize content into smaller chunks to help users process, understand, and memorize easily.*
- *Remember that short-term memory capacity will vary per individual, based on their prior knowledge and situational context.*

**Serial position effect -** The Serial Position Effect is the psychological effect that seems to happen when a person recalls the first and last items in a list more often than the middle items. The recency effect is a cognitive bias that results in a user recalling information that was presented at the beginning of a list better than information presented later on. Primacy effect is another cognitive bias that causes users to recall items at the end of a list.

**Dual coding theory -** *Memory is influenced by the relationship between verbal information and non-verbal information. When verbal information (text) is paired with non-verbal information (images), it improves the probability of information recall.*

**Hick's Law -** This law implies that the time needed to make a decision depends on the available choices.Example — [Jam experiment]




**Decision paralysis -** It occurs when we have to select from options that are difficult to compare. Don't overwhelm users with too many choices; it is also known as analysis paralysis or paradox of choice.

**Von Restorff Effect / Isolation effect -** *The Von Restorff effect or The Isolation Effect says that people are more likely to remember an object that's even slightly different than other similar objects. It's why CTA buttons tend to have different colors than the rest of the design in a page .*

**Cocktail effect -** The cocktail party effect refers to the ability of people to focus on a single talker or conversation in a noisy environment. Imagine that you're using a website, and suddenly you see your name highlighted on the page. Once your eyes see it, they immediately focus and pay attention to it. [Personalization] is a chance to differentiate at a human scale, to use behavior as the most important clue about what people want and more importantly, what they need.

**Peak-End Rule -** People judge an experience largely based on how they felt at its peak and at its end, rather than the total sum or average of every moment of the experience." The peak–end rule is a cognitive bias that impacts how people remember past events. Intense positive or negative moments (the "peaks") and the final moments of an experience (the "end") are heavily weighted in our mental calculus.

**Postel's Law (Robustness principle) -** Be conservative in what you do, and be liberal in what you accept from others. Be flexible in what you accept from your users and limit what you ask of them. Postel's law also goes by the name of the robustness principle. And it makes two points:

- Take what users share with you. For example, if you ask a user to share their country and they enter '**US' instead of 'United States,**' accept it and convert the data for consistency yourself.
- Ask for **limited information**. This means you ask for only what's important to encourage folks to take action — the same as Netflix does.

**Goal-Gradient Effect -** The closer users are to completing a task, the faster they work towards reaching it. Visually show the progress towards a goal, for example by means of a ‘progress bar’, or a ‘countdown timer.

**Chameleon Effect -** The principle of emotional contagion or chameleon effect states that humans will mimic or empathize with the emotions and behaviors of others, including animals and animations. A good example is how Duolingo uses the Language Bird to encourage users to return to the app. If a user misses a lesson, Language Bird is upset and crying. But when you complete a class, Language Bird is cheerful and excited.

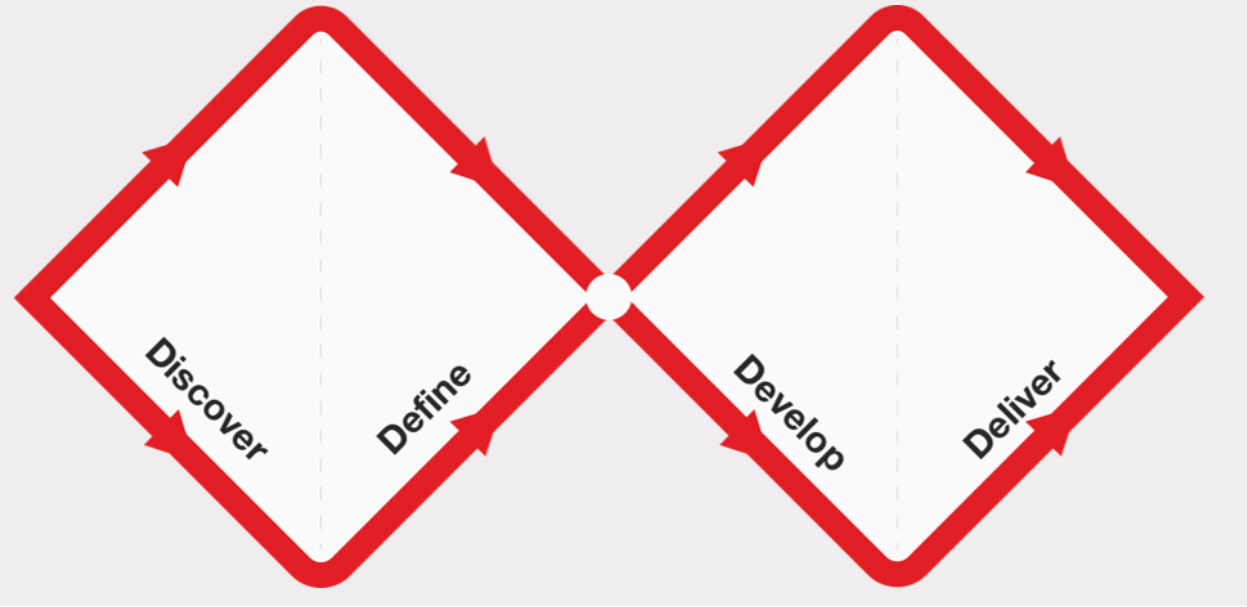
**Zeigarnik Effect -** We have a tendency to remember interrupted or incomplete tasks or events more easily than tasks that have been completed.Below are a few best practices

- Show users that you have more content and services to provide. This will create some interest to return to your product.
- Uncompleted tasks create more motivation. For example, you know that you need to exercise more, but sometimes it is hard. Different services can help you to solve this problem.
- Setting goals, and creating progress trackers to show how close the users are to completing their tasks — these elements can help improve engagement.

**The Halo Effect -** *The Halo effect is a social psychology phenomenon that causes people to be biased in their judgments by letting their feelings about one trait influence their overall opinion of the product. This can have both positive and negative consequences.*

- If a user likes one aspect of something, they are likely to form a positive opinion about the whole product.
- If a user dislikes an aspect of something, they are likely to form a negative opinion about the whole product.

**Double Diamond - The Double Diamond is a visual representation of the design and innovation process. It's a simple way to describe the steps taken in any design and innovation project, irrespective of methods and tools used.**



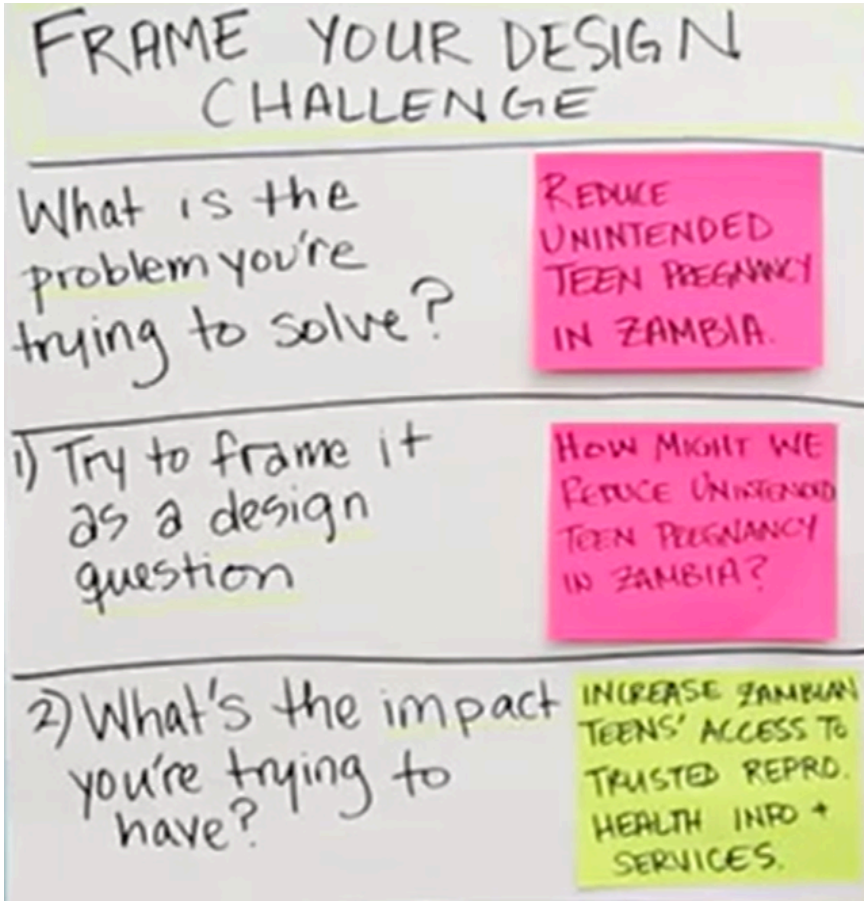
## How Might We - **Every problem is an opportunity for design. By framing your challenge as a How Might We question, you'll set yourself up for an innovative solution.** By defining themes and insights, you've identified problem areas that pose challenges to the people you're designing for. Now, try reframing your insight statements as How Might We questions to turn those challenges into opportunities for design. We use the How Might We format because it suggests that a solution is possible and because they offer you the chance to answer them in a variety of ways. A properly framed How Might We doesn't suggest a particular solution, but gives you the perfect frame for innovative thinking. **How Might We steps :**

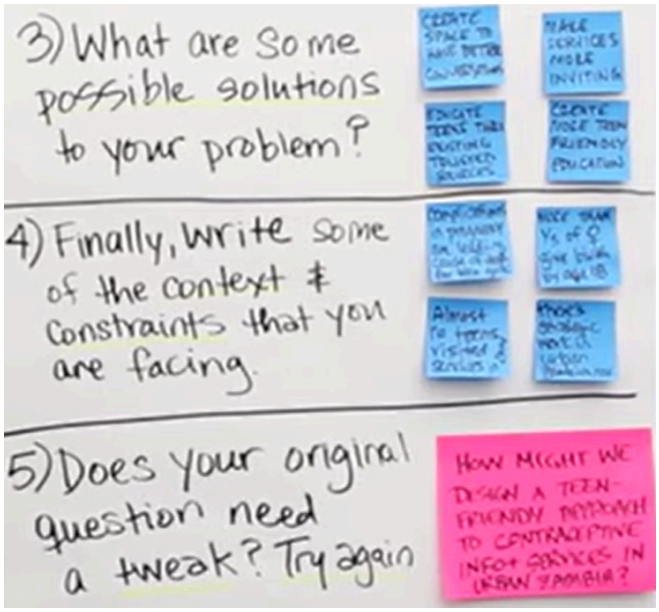
- **Start by looking at the insight statements that you've created. Try rephrasing them as questions by adding "How might we" at the beginning.**
- **The goal is to find opportunities for design, so if your insights suggest several How Might We questions that's great.**
- **Now take a look at your How Might We question and ask yourself if it allows for a variety of solutions. If it doesn't, broaden it. Your How Might We should generate a number of possible answers and will become a launchpad for your Brainstorms.**
- **Finally, make sure that your How Might We aren't too broad. It's a tricky process but a good How Might We should give you both a narrow enough frame to let you know where to start your Brainstorm, but also enough breadth to give you room to explore wild ideas.**

**Frame Design Challenge -** Does my challenge drive toward ultimate impact, take into account context and constraints, and allow for a variety of potential solutions? You'll dial those in, and then refine your challenge until it's one you're excited to tackle . **STEPS :**

- Start by taking a first stab at writing your design challenge down. It should be short and easy to remember. Try composing a single sentence that conveys the problem you want to solve. We often phrase these as How Might We ask questions to set our teams up to be solution-oriented and to generate a lot of ideas along the way.
- Now that you have a draft of your design challenge, explore and align on the goal or outcome you hope to achieve. Use the Align On Your Impact Goals activity to ensure that you, your team and any other stakeholders have the same vision of success in mind.
- Next you'll want to think about the audience you're aiming to serve and the context, constraints, and influences in their lives. Use the Define Your Audience activity to map the ecosystem around your user and the shifts or changes that you might need to influence through your design. This step will help you see how broad or narrow your challenge scope needs to be.
- Now that you've gathered and organized more information, review your design question and see if it still feels right. Refine your question and capture this, and the information you used to get there, in your Frame Your Design Challenge worksheet.
- Framing the right design challenge is key to arriving at a good solution. A quick test we often run on a design challenge is to see if we can come up with five possible solutions in just a few minutes. If so, you're likely on the right track. Try this, and make tweaks as needed to get to the right framing and scope.

## Frame Design Challenge & How Might We Example -



**The Five Whys -** This easy research method will help you uncover the deep motivations and assumptions that underpin a person's behavior. The Five Whys is a fantastic method to use to get to the core of a person's beliefs and motivations. Sure, you may feel like a four-year-old asking "why" every time a person answers your previous question, but if you stick with it, and give the person you're interviewing the time, space, and permission to really go deep, you're likely to wind up with a few key insights. You'll use this method while you're conducting an Interview and start with really broad questions like "Do you save much money?" or "How was your harvest this year?" Then, by asking why five times you'll get to some essential answers to complicated problems. This can be a great method to use if you're trying to get at the human and emotional roots of a problem. **STEPS :**

- This one is pretty easy. Start by asking a pretty broad question about your Interview participant's habits or behaviors then ask "why" to their response five times in a row.
- Remember that you're not asking a horizontal question, (ie "Why else didn't you get a good harvest this year?") you're actually going for depth (ie "Why weren't you able to buy the fertilizer you needed?").
- Write down what you hear, paying special attention to moments when it feels like you've moved a level deeper into understanding why the person does what she does.
- Keep in mind that you might not get to the core stuff until the fourth or fifth "Why."

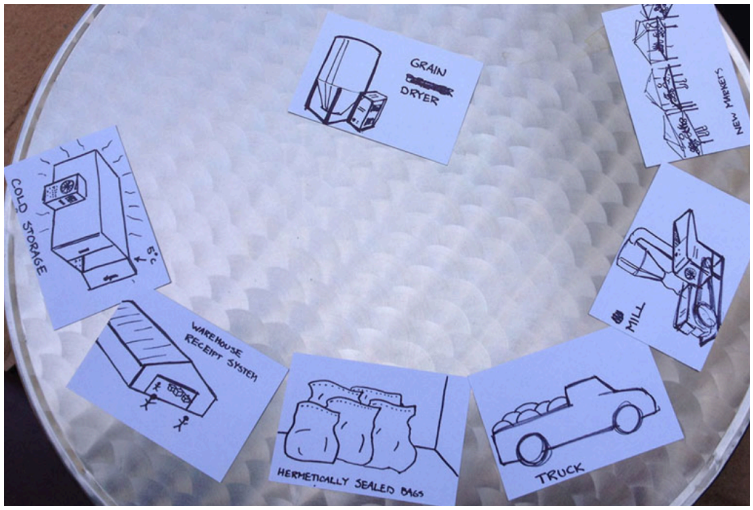
**Card Sort -** This simple exercise will help you identify what's most important to the people you're designing for . A Card Sort is a quick and easy way to spark conversation about what matters most to the people you're designing for. By putting a deck of cards, each with a word or single image, in someone's hands and then asking them to rank them in order of preference, you'll gain huge insight into what really counts. You can also use the Card Sort exercise to start a deeper conversation about what he or she values and why . **STEPS**

- Make your deck of cards for the card sort. Use either a word or a picture on each card, but whatever you select, make sure that it's easy to understand. Pictures are a better choice if the person doing the Card Sort speaks another language or cannot read.
- When tailoring your deck of cards to your precise research objectives, be sure that you're mixing concrete ideas with more abstract ones. You can learn a lot about how the person you're designing for understands the world by making this exercise more than just a simple ranking.
- Now give the cards to the person you're designing for and ask her to sort them according to what's most important.
- There are a couple variations on this method that work nicely: Instead of asking the person you're designing for to rank the cards in order of preference, ask her to arrange them as she sees fit. The results might surprise you. Another tweak is to pose different scenarios. Ask the person you're designing for how she would sort the cards if she had more money, if she were old, if she lived in a big city.

# Card Sort - Method in Action :

**THE PROJECT -** While working on post-harvest loss for smallholder farmers in sub-Saharan Africa, we wanted to understand how farmers perceived the issue of food spoilage—basically any of their harvest that went bad before it could be sold or eaten. Instead of just asking farmers what they thought about this problem we used a card sort game to get a more nuanced picture. After using regular interviewing techniques to delve into how much food a farmer loses and why, we would ask farmers to put a set of illustrated cards in sequence of what they would invest in first.

**HOW I USED THIS METHOD -** To start, we created a number of different illustrated cards to choose from that represented farming inputs or investments—such as water, fertilizer, pesticides, or more robust solutions like, cold storage and transportation. By asking farmers to show us what they would invest in first to increase their financial stability, we were able to unearth the priorities that farmers have and how they believe they should overcome their limitations. By not being explicit in our questions (for example, avoiding a prompt like 'What would help you conserve more food?'), we gave people the "space" to show us how they might roadmap their own future. This method is incredibly easy to do, either using simple hand drawings or pictures of the scenarios you are trying to communicate. What's important to consider is how you phrase your suggestion to the participants around prioritizing the cards. You want to make sure you are not getting just the obvious answers, but rather digging out deeper insight into what really matters to the people you are designing for.




**WHAT I LEARNED -** What our team uncovered during this simple card sort activity ended up being crucial in helping us gain a fuller understanding of the people we were designing for. It became clear that the most vulnerable farmers were entirely focused on two things—growing a bigger quantity of food and growing at a higher quality. Because they were so concentrated on these goals, they saw little value in post-harvest loss technologies. This pattern clearly showed up across the spectrum of smallholder farmers, which ranges from unstable farmers, to slightly more stable, to significantly stable farmers. Furthermore, this exercise helped to uncover a universal perception that is very culturally prevalent; people believe maximum *benefit will be gained by growing and selling more food rather than considering the financial benefits that would come with conserving more of the food they've already grown. Because of this 'blind spot' post-harvest loss technologies have seen slow adoption rates among most smallholder farmers.*

**Logic Model -** A Logic Model is a great next step after you Explore your Theory of Change activity. It is a succinct and visual narrative that summarizes the final set of activities in your solution, and the way that each of these will lead to change over time. It's a great way to communicate the rationale behind your solution quickly to others, and a crucial foundation for developing a plan to Monitor and Evaluate your solution later. There are some best practice ways to define and order your activities, milestones, and goals in a logic model. The steps and video below will guide you. **STEPS :**

- Begin by writing the following on Post-it notes: IMPACT, OUTCOMES, OUTPUTS, AND INPUTS and put them up on the wall. Order them with IMPACT at the top and INPUTS at the bottom.
- Now, pull out the Impact Ladder worksheet you completed during your Theory of Change activity. You will see it follows this same basic structure, where you have captured activities (OUTPUTS) to address some key shifts (INTERIM OUTCOMES) to achieve bigger goals (KEY OUTCOME and IMPACT).
- Write your various outputs/outcomes on Post-it notes and organize them on your wall at the level they correspond to. Aim for a clear structure, or flow, that visualizes how one thing leads to another. This bit can be a bit complex if you have many solution components, so watch the video below for a guiding example.
- You interrogated the logic behind your solution when working on your theory of change. This is a good moment to do it again. Does the logic for how one thing will lead to another hold up? What leaps are we making at each step? Do any steps need to be added in? Capture these, and refine your model.
- Be sure to update your Logic Model any time that you make refinements or adaptations to your solution, and reference it closely when you Define Your Indicators for measuring solution effectiveness later.

**Live Prototyping -** A Live Prototype is a chance to run your solution for a few weeks or months out in the real world. Though you've been getting feedback from the people you're designing for all along, a Live Prototype gives you a chance to stress test your complete solution in real world conditions. It can run from a few weeks to a few months, and it might be the first time that you observe how all parts of your solution work together as one system. It's similar to a Pilot in that way, but usually involves more real-time troubleshooting and iterations during the testing period. Live Prototypes are all about understanding the feasibility and viability of your solution so that you can optimize it further. **STEPS :**

- The first step is to determine what it is you want to learn in your Live Prototype. What outstanding questions have you got about how your solution will reach its audience? What do you need to validate about it's feasibility or effectiveness? You will likely have surfaced a number of these unknowns during your Theory of Change activity.
- Once you've decided on your learning goals you're ready to determine the scope of your live prototype. How long does it need to run for to get the data you need? In how many locations should you test? As a general rule of thumb, smaller is better in a live prototype as you'll most certainly need to iterate on your solution afterwards.
- Check out the Monitor and Evaluate activity to help you identify key indicators and data collection tools you will need. Consider the logistics of your Live Prototype too. Do you need a physical space, additional staff, uniforms, a permit, or anything else?
- If you have the capacity, think about running a few Live Prototypes at once. This will allow you to test variations on your solution quickly.
- Keep Iterating. If something went wrong on Day 1, try a new approach on Day 2. Live Prototypes are all about learning quickly, iterating on the fly, and pushing your solution closer and closer to the real thing. This will fast-track your progress to an impactful solution that is ready for next level testing in a Pilot.

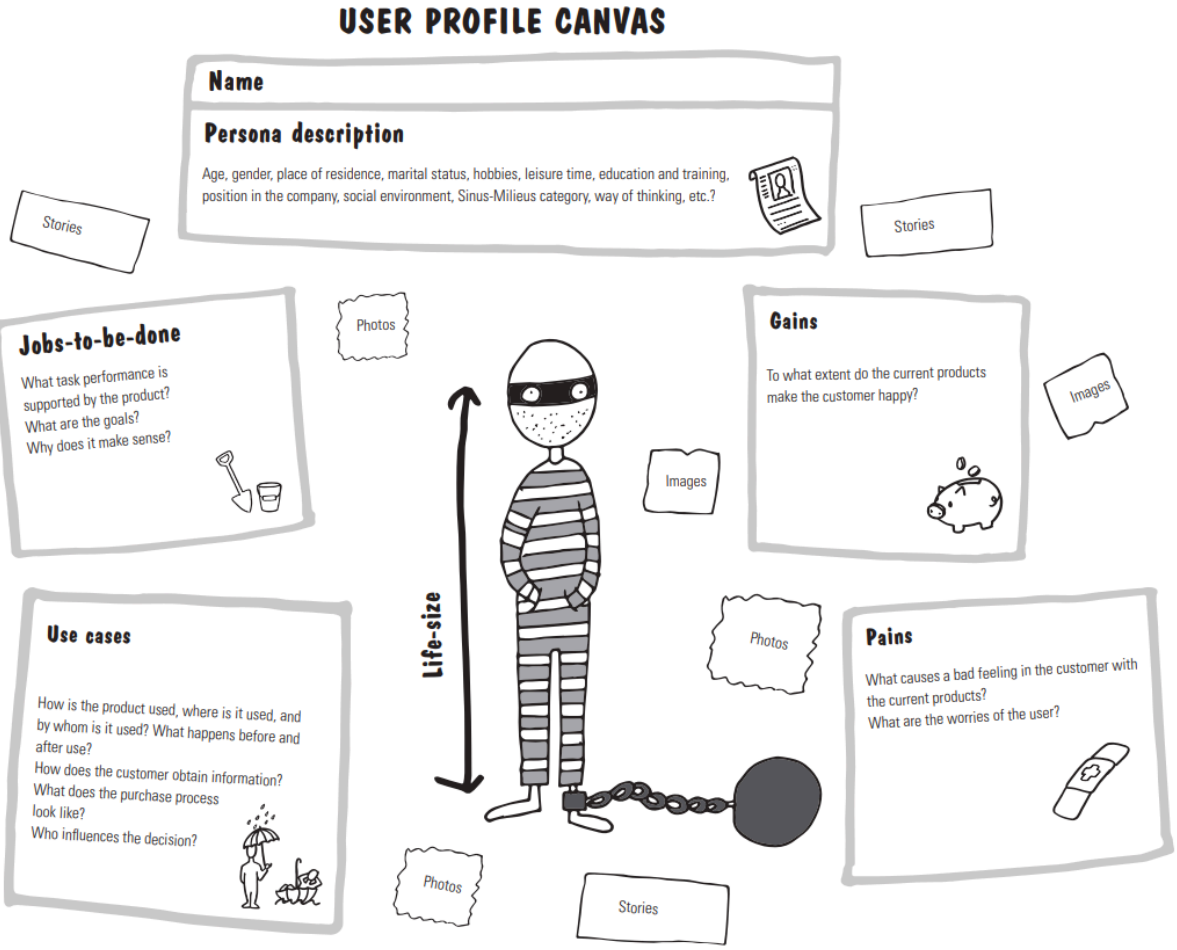
**Theory of Change -** Articulate and interrogate your assumptions about how your solution will create positive change . **STEPS**

- Start by reviewing the key outcome you're aiming to achieve. You defined this in your Impact Ladder right at start when framing your design challenge. Is it still the right one or has it evolved through the design journey?
- Next, using the Theory of Change worksheet, write out each of the shifts that you are trying to solve for, and then each of the concepts that you are excited about taking forward. Use Post-it notes if you have them and organize them in a grid structure on a wall or other workspace.
- Now you're going to get critical about your shifts and your concepts. You'll explore which shifts are a priority to address, and then how well each of your concepts addresses those. The Theory of Change worksheet will steer you through this.
- This process will push you to articulate a theory, or rationale, for how your solution will create change and achieve your key outcome (from Step 1 above). Stand back and interrogate this emerging theory of change. Does the logic for how one thing will lead to another hold up? What assumptions or risks are there at each step? Try having someone outside of your design team join this discussion for a more objective push.
- There are many ways to document a theory of change. We suggest that you use the Impact Ladder in the activity guide to quickly capture the output of this activity in the first instance. Then use the Logic Model activity to get to a more detailed and clearly structured visualization of your solution model.

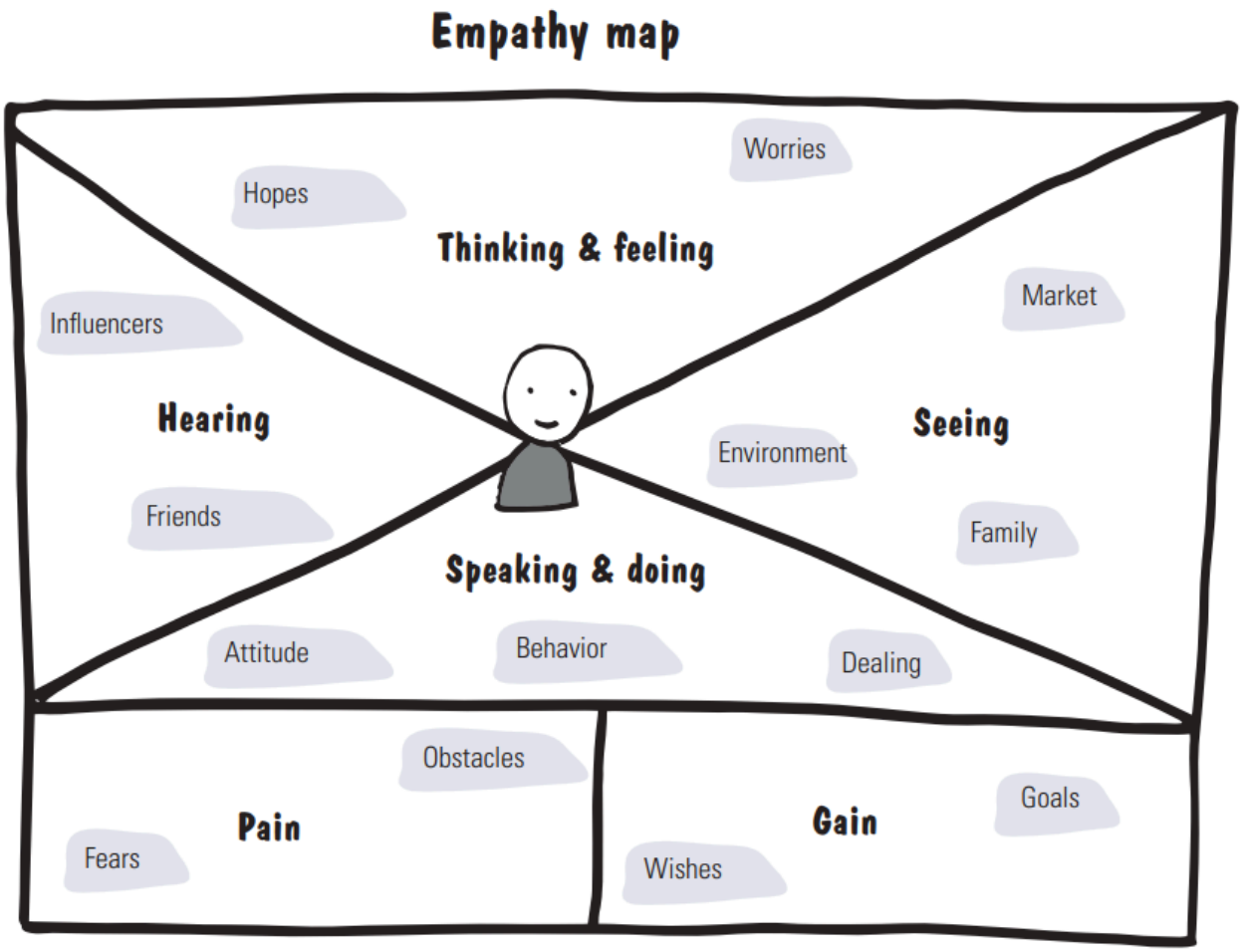
**Pilot -** A Pilot is a longer-term test of your solution and a critical step before going to market. If a Live Prototype is a quick look at how your solution behaves in the marketplace, a Pilot is a sustained engagement. Pilots can last months and will fully expose your solution to market forces. At this point you're not testing an idea—should my product be green? do I need a different logo?—you're testing an entire system. Ideally you'll have run a few Live Prototypes before going to Pilot so that some of the kinks are worked out. During a Pilot you'll fully execute on your idea finding out if it truly works the way you envisioned by running it with all the staff, space, and resources necessary. You'll learn if your idea really is desirable, viable, and feasible, and what it might look like to do it at scale. If it's a success, you'll head to market. **STEPS :**

- First you'll need to sort out all the logistics of your Pilot. Who will you need to hire, should you rent a space, are your distributors and manufacturers lined up, do you need a permit or anything like that?
- Before you launch your Pilot, strategize how you can differentiate from your competition, how you get customers in the door, or what kind of messaging you need to succeed? You'll be out in the market and you need to plan for those dynamics.
- You'll be iterating less in Pilot because now is the time to truly test your system. You can of course make necessary improvements, but if you change too many variables it may become harder to know what's working and what isn't.
- At the Pilot stage you'll probably need to collect more rigorous data and evidence. Ensure you have a fit-for-purpose measurement plan by using the Monitor and Evaluate activity, and consider bringing some measurement expertise into your team now if you have not done so already. Feedback from the people you're designing continues to be crucial.

## User Profile Canvas :



**Empathy Map -**


Empathy map
Worries
Hopes
Thinking & feeling
Market
Influencers
Hearing
Seeing
Environment
Friends
Family
Speaking & doing
Attitude
Behavior
Dealing
Obstacles
Goals
Pain
Gain
Fears
Wishes

## Review the persona - AEIOU Questions :

To obtain initial knowledge on the user, another tool that helps is the AEIOU method. AEIOU helps us to capture all the events in our environment.

The task is clear. Get out of the design thinking rooms and speak to potential users, walk in their shoes, do what they do.

The AEIOU questions help to put some structure into the observations Especially with inexperienced groups, it is easier this way to ensure an efficient briefing on the task at hand.

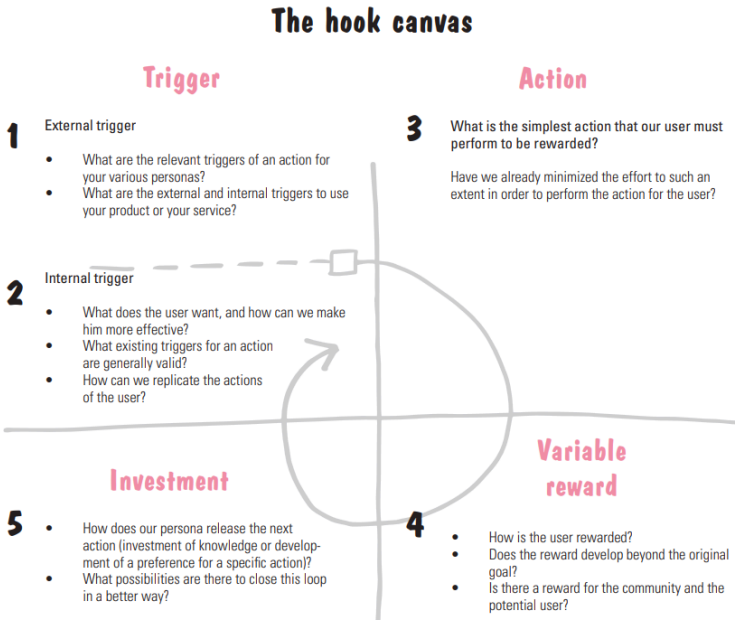
Depending on the situation, it is useful to adapt the questions individually to the respective observations. The AEIOU catalog of questions and the associated instructions help participants establish contact with initial potential users. Experience has taught us that it helps the groups if a design thinking facilitator or somebody with needfinding experience accompanies first contact of potential users.

AEIOU is broken down into five categories.
Consider how each of the users behaves in the real world and the digital world.

| | |
|---|---|
| **A**ctivities | What happens?<br>What are the people doing?<br>What is their task?<br>What activities do they carry out?<br>What happens before and after? |
| **E**nvironment | What does the environment look like?<br>What is the nature and function of the space? |
| **I**nteraction | How do the systems interact with one another?<br>Are there any interfaces?<br>How do the users interact among one another?<br>What constitutes the operation? |
| **O**bjects | What objects and devices are used?<br>Who uses the objects and in which environment? |
| **U**ser | Who are the users?<br>What role do the users play?<br>Who influences them? |

# Hook Framework - Hook Canvas :

The hook framework (Alex Cowan) is based on the idea that a digital service or a product can become a habit for a user. The hook canvas is based on four main components: trigger for an action, activity, reward, and investment. For the potential user, there are two triggers for his actions: triggers from the external environment (e.g., a notification from Tinder that you received a "Super Like") or internal triggers for an action (e.g., visiting the Facebook app when you feel lonely).
The action describes the minimum interaction of your service or your product with a potential user. As a good designer, you want to design an action to be as simple and fast as possible for the user.
Reward is the key emotional element for the user. Depending on the configuration of the action, the user can be given a lot more than the satisfaction of the initial need. Think of positive reviews and feedback through a comment or article. You just wanted to share the information, but you get back far more due to the reputation of the community.
The question remains as to what the user invests in order to get himself back in the loop and to trigger an internal or external action. For example, he actively follows a Twitter feed or writes a notification that a certain product or service is available again.



## Jobs-to-be-Done-Framework :

### What is the actual task of a product?

The jobs-to-be-done framework became widely known through the milkshake example. The problem statement looks familiar to us: How can the sales of milkshakes be increased by 15%? With a conventional mindset, you would look at the properties of the product and then consider whether a different topping, another flavor, or a different cup size might solve the problem. Through a customer survey, you find out that the new properties are popular. However, in the end, only incremental innovations are realized, and the result has only been marginally improved. The jobs-to-be-done framework focuses instead on a change of behavior and on customer needs. In the case of the milkshake, it was found this way that two types of customers buy milkshakes in a fast food restaurant. The point of departure was: Why do customers buy a product? To put it differently: What product would they buy instead of the well-known milkshake?

**The result:**
The first type of customer comes in the morning, commutes to work by car, and buys a milkshake as a substitute for breakfast and as a diversion while driving. Coffee doesn't work because it is first too hot and then too cold. It is also liquid and can spill easily. The ideal milkshake is large, nutritious, and thick. So the jobs-to-be-done of the milkshake are therefore a breakfast substitute and a pleasant diversion while driving to work.
The second type of customer comes in the afternoon, usually, a mother with a child. The child wants something to eat in the fast food restaurant and is whining. The mother wants to get something healthy for the child and buys a milkshake. The milkshake should be small, thin, and liquid, so the child can drink it quickly, and it should be low in calories. The milkshake's jobs-to-be-done are to satisfy the child and make the mother feel good. In principle, for any product, whether digital or physical, you can ask: Why would a customer buy my product or service?

Innovations like those designed by Adobe Photoshop and Instagram are good examples of jobs-to-be-done in the digital environment. Both solutions aim at making photographs look like those taken by pros. Photoshop offers easy professional editing of pictures through an app. Instagram realized early on that pictures can be easily edited and shared via social media.

### Jobs-to-be-done, digital

# How Might we Develop a Persona :

## HOW MIGHT WE... develop a persona?

Because human beings always take center stage in design thinking and the persona to be created is very important, we sketched out the approach once more by way of example. When teams are tasked with developing "empathy" with a user over a certain period of time, or when they first apply design thinking, it is useful to specify a structure and the steps to be taken. Depending on the situation, we recommend using the tools just described (AEIOU, jobs-to-be-done framework, hook canvas, user profile canvas) or integrating and using other methods and documents into the steps listed here.
To help you better understand this process, the *Playbook* is interspersed with various "How might we . . ." procedures.

### 1. Find the user

**Questions**
Who are the users?
How many are there?
What do they do?

**Methods**
Quantitative collection of data, AEIOU method

### 2. Building up a hypothesis

**Question**
What are the differences between the users?

**Methods**
Description of the groups of similar users/segmentations

### 3. Confirmations

**Question**
Is there any data or evidence that confirms the hypothesis?

**Methods**
Quantitative collection of data, empathy map

### 4. Finding patterns

**Questions**
Are the initial descriptions of the groups still correct? Are there other groups that might be important?

**Methods**
Categorization, applying the jobs-to-be-done framework

### 5. Creating personas

**Question**
How can the persona be described?

**Methods**
Categorization, persona

### 8. Dissemination of knowledge

**Question**
How can we present the personas and share them with other team members, the enterprise, or stakeholders?

**Methods**
Posters, meetings, e-mails, campaigns, events, videos, photos

### 7. Validation

**Question**
Do you know such a person?

**Methods**
Interviews with people who know the personas
Reading and commenting on the persona description

### 6. Define situations

**Questions**
What use cases does the persona have?
What is the situation?

**Methods**
Searching for situations and needs
User profile canvas/customer profile
Customer journey

### 10. Continuous further development

**Questions**
Is there any new information? Does the persona have to be newly described?

**Methods**
Usability test, continuous revision of the persona

### 9. Creating scenarios

**Questions**
In a given situation and with a given objective: What happens when the persona uses the technology?

**Methods**
Narrative scenario—storytelling, descriptions of situations, and stories in order to create scenarios
Application of hook canvas

# Future User :

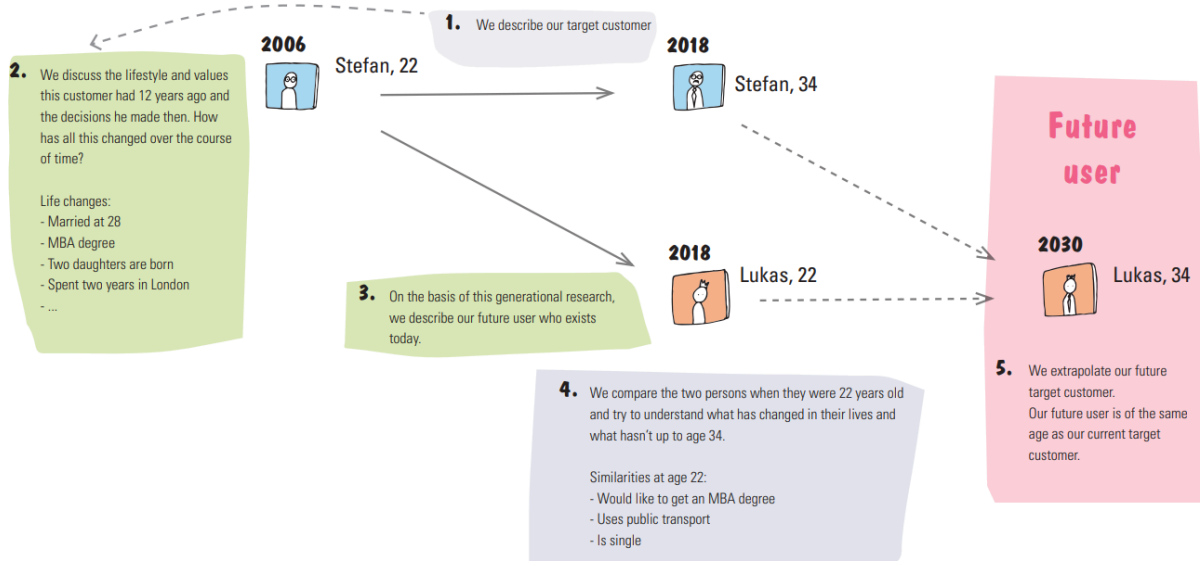
**How do we map the user of the future?**

Especially in radical innovation projects, the time horizon is often far longer. It may take 10 years before a product is launched on the market, for example. If its target group is 30 to 40 years old, this means that these users now are 20 to 30 years old.

The future user method attempts to extrapolate these users' future personas (see "Playbook for Strategic Foresight and Innovation"). It expands the classic persona by analyzing today's persona and its development over the last few years. In addition, the future target group is interviewed at their present age. Subsequently, the mindset, motivation, lifestyle, etc. are extrapolated to get a better idea of the future user.

The method is easy to apply. It is best to start with the profile of the current user and underpin it with facts, market analyses, online surveys, personal interviews, and so forth.

When developing the persona, changes in values, lifestyle, use of technologies/media, product habits, and the like, must be borne in mind.

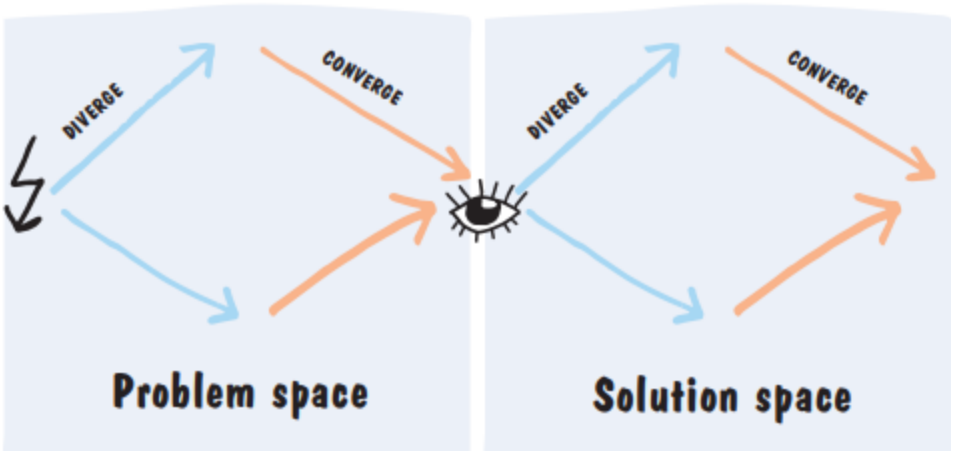


## Key Learnings - Working with Personas :

- Use real people with real names and real properties.
- Be specific in terms of age and marital status. Get demographic information from the Internet.
- Draw the persona, in life-size, if possible.
- Add visualizations to the persona. Use clip outs from magazines for accessories (e.g. watch, car, jewelry).
- Identify and describe use cases in which they would use the potential product or services.
- Put the potential user in the context of the idea, his team, and the application.
- List pains and gains of the persona.
- Capture the customer tasks (jobs-to-be-done) that the product or service supports.
- Describe the experience that is particularly critical. Build a prototype that makes it possible to find out what is really critical.
- In so doing, try to take the persona's habits into account.
- Try out tools for the definition of the content (e.g., user canvas and customer profile, hook canvas, future user, etc).

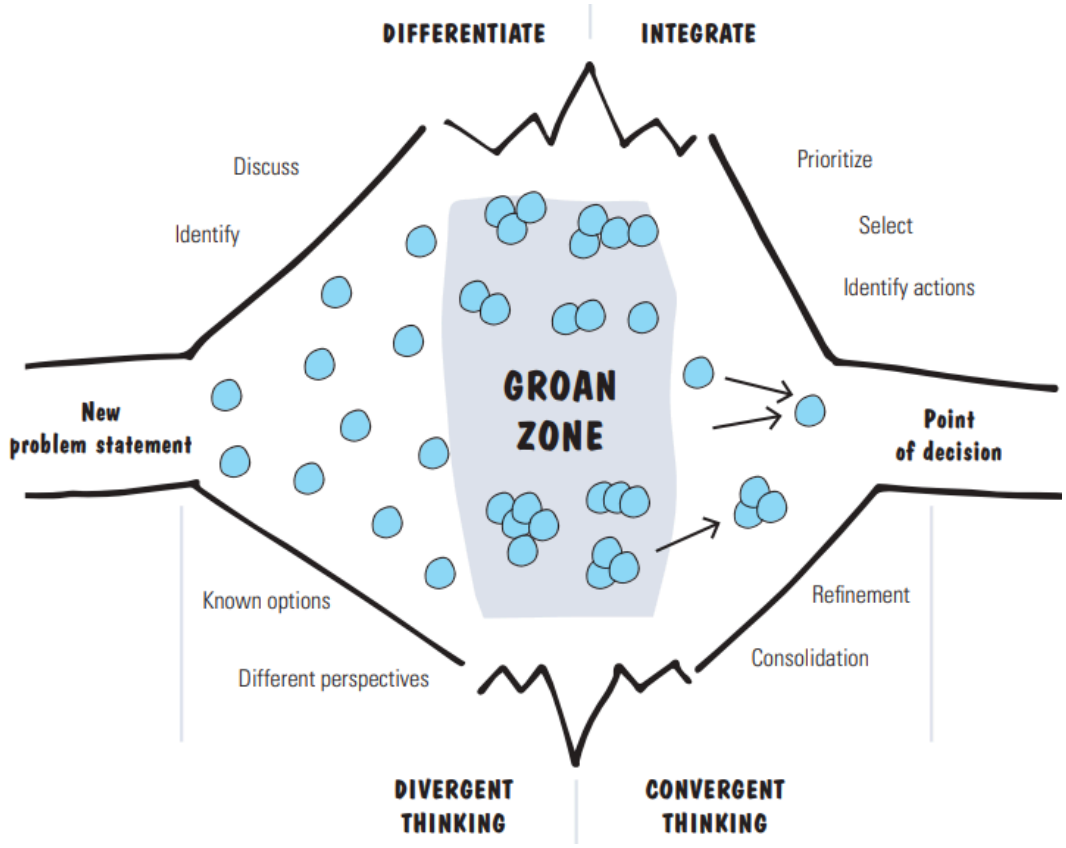
## Process awareness :

Alongside the current level of development, the tools must be constantly kept in mind in design thinking. Which of them are the most effective in the current situation? There are generally two mental states in the "hunt for the next big opportunity": Either we develop many new ideas (i.e., we "diverge,") or we focus on and limit ourselves to individual needs, functionalities, or potential solutions (i.e., we "converge"). This is usually depicted in the shape of a double diamond.

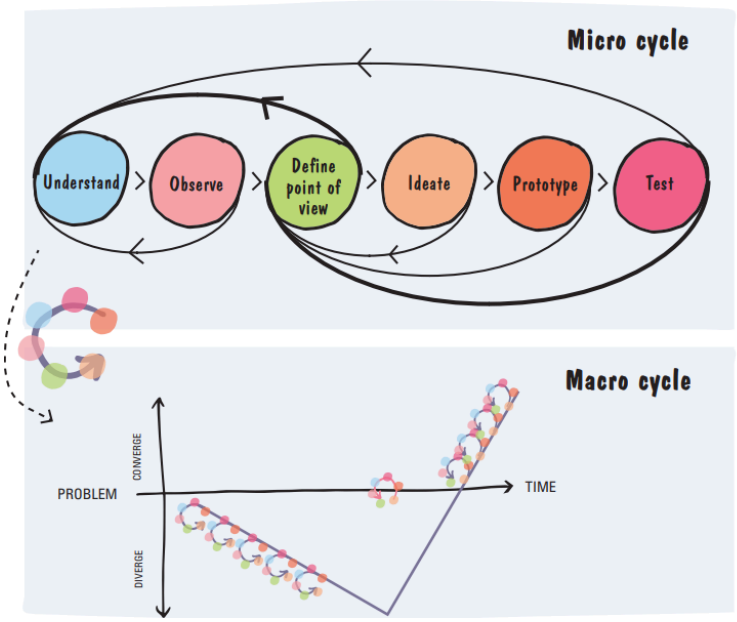



Steve Jobs was a master when it came to managing the "groan zone" optimally. He had the right instinct to choose the time for a change of mindset and for leaving the divergent phase. This way, he led his teams to brilliant solutions. At Apple, Bud Tribble established the term "reality distortion field," standing for Steve Jobs's ability to master the mental leap. The term stems from an episode of the original *Star Trek* series, "The Menagerie," in which aliens create their own world by means of their thoughts.

## Convergent & Divergent thinking - Point in time to change the mindset :



## Design Thinking micro cycle :




The IDEO design and innovation agency had originally defined five simple steps in the micro cycle in order to get to new ideas through iterations. In addition, they put a strong focus on implementation, because the best ideas are ultimately of no use if we haven't established them on the market as a successful innovation:

UNDERSTAND the task, the market, the clients, the technology, the limiting conditions, restrictions, and optimization criteria.

OBSERVE and ANALYZE the behavior of real people in real situations and in relation to the specific task.

VISUALIZE the first solution drafts (3D, simulation, prototypes, graphics, drawings, etc.).

EVALUATE and OPTIMIZE the prototypes in a fast succession of continuous repetitions.

IMPLEMENT the new concept in reality (the most time-consuming phase).

## Scrum Process -

At most companies, a micro design thinking process is broken down into three to seven phases, often based on the steps of IDEO, d.school, and the HPI. The Swiss ICT company Swisscom has designed a simplified micro cycle that allows for integrating the mindset quickly into the organization.
The phases are: **Hear—Create—Deliver.**

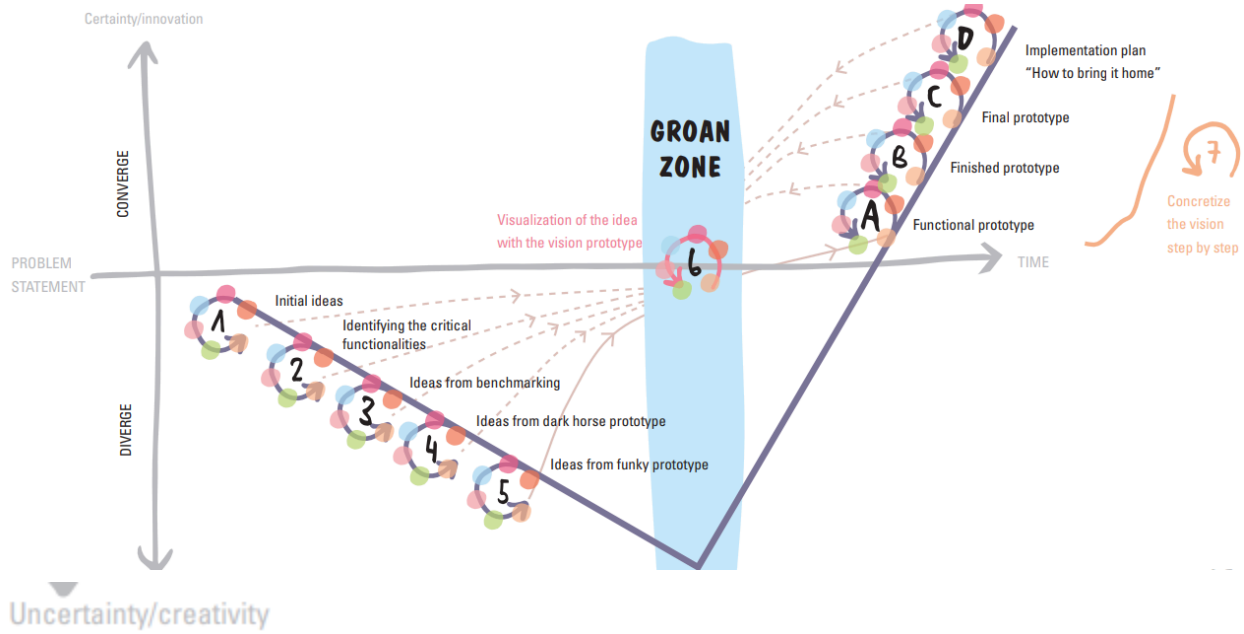
| Phase | Description | Basic tools |
|---|---|---|
| **Hear** | - Understand the project<br>- Understand the customer problem/need<br>- Procure information, internal and external<br>- Gather experience directly from the customer | Design challenge<br>Customer interview |
| **Create** | - Transform what was learned into potential solutions<br>- Generate multiple solutions and possibilities<br>- Define solution features | Core beliefs<br>Target customer experience chain |
| **Deliver** | - Concretize ideas<br>- Create and test prototypes<br>- Verify, expedite, or reject ideas<br>- Gain insights and learn from them | Need, Approach, Benefit, Competition (NABC)<br>Prototyping plan<br>Self-validation |

**Design thinking micro cycle - Overview of tools & methods in each phase -** The micro cycle of design thinking consists of recurring steps of (re)defining the problem, need-finding and synthesis, ideation, prototype, and testing. The micro cycle is embedded in the macro cycle :

OVERVIEW OF TOOLS AND METHODS IN EACH PHASE

| Phase | Shortcut to examples of tools & methods | Page |
|---|---|---|
| Understand | • Create a persona | 26 |
| | • Use the hook canvas | 30 |
| | • Use jobs-to-be-done framework | 31 |
| | • Create future user | 34 |
| Observe | • Complete empathy map | 28 |
| | • Perform AEIOU (what? how? why?) | 29 |
| | • Check critical assumptions | 60 |
| | • Needfinding discussion, including posing open questions | 63 |
| | • Lead user | 66 |
| | • WH questions | 69 |
| | • Be mindful | 75 |
| | • Use talking stick | 76 |
| | • Include empathy in UX design | 77 |
| Define point of view | • Carry out 360° view | 82 |
| | • Use 9-window tool and daisy map | 85 |
| | • Formulate sentence for point of view, e.g., "How might we . . ." questions | 87 |
| Ideate | • Hold a brainstorming session | 91 |
| | • Apply creativity techniques | 93 |
| | • Gain depth of ideas | 94 |
| | • Scamper | 96 |
| | • Structure, cluster, and document ideas | 98 |
| | • Idea communication sheet | 105 |
| Develop prototype | • Develop prototypes | 108 |
| | • Use different kinds of prototypes | 111 |
| | • Boxing and shelfing | 113 |
| | • Hold prototyping workshop | 115 |
| Test | • Test procedure | 118 |
| | • Use feedback-capture grid | 123 |
| | • Conduct A/B testing | 124 |
| | • Experiment grid | 128 |
| Reflect | • Use retrospective board | 44 |

## How might we - Run through the design thinking macro cycle :



# Hunt for next big market often follow these steps Part 1 :

### (1) Initial ideas are worked out in a brainstorming session

An initial brainstorming session about potential ideas and solutions helps the group to place all sorts of ideas and get them off their collective chest. Frequently, the levels of knowledge of the individual team members in terms of the problem statement and a possible solution spectrum are quite different. An initial brainstorming session helps in approaching the task and learning how the others in the group think.

**Instruction:** Give the group 20 minutes for a brainstorming session. The issue here is quantity, not quality. Every idea is written on a Post-it. When writing or sketching on the Post-it, the idea is expressed aloud; afterward, the note is stuck to a pin board.

**Ask the group to answer the following key questions:**

- Which ideas come to mind spontaneously?
- Which solution approaches are pursued by the others?
- What can we do differently?
- Do we all have the same understanding of the problem statement?

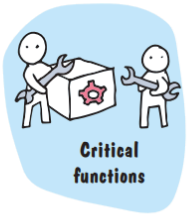
### (2) Develop critical functionalities that are essential for the user

This step can be crucial for the solution. The facilitator has the task of motivating the groups so they identify exactly these "important things" and prepare a ranking in the context of a critical user.

**Instruction:** Give the group one to two hours—depending on the problem statement—to draft, build, and test 10 to 20 critical functions.

**Ask the group to answer the following key questions:**

- Which functionalities are mandatory?
- What experience is absolutely necessary for the user?
- What is the relationship between the function and the experience?




### (3) Find benchmarks from other industries and experiences

This step is a very good tool when teams are not able to tear themselves away from an original solution concept.
Benchmarking helps participants think outside the box and adapt ideas from these areas for the solution of the problem. The facilitator broadens the creative framework by motivating the groups to hold the brainstorming session, taking into account a certain industry/sector or a particular experience. You can proceed in two steps, for instance: (a) brainstorming of ideas relating to the problem, and (b) brainstorming of industries and/or experiences. Subsequently, the three best ideas from each step are identified. Based on the combination of these, the facilitator invites the participants to develop two or three ideas further, build them physically, and test them with the user.

**Instruction:** Give the group 30 minutes for a brainstorming session, 30 minutes for finding benchmarks, and 30 minutes for clustering and combining ideas. Depending on the task, the group is given enough time to build two to three prototypes.

**Ask the group to answer the following key questions:**

- Which successful concepts and experiences can be applied to the problem?
- Which experiences can illuminate the problem from another perspective?
- What is the relation between the problem and other experiences?

# Hunt for next big market often follow these steps - Part 2 :

### (4) Heighten creativity and find the dark horse among the ideas

This step helps many teams to boost creativity further—not least because, for the dark horse, borders are lifted, which might have limited us in the previous steps. The facilitator motivates the groups to strive for maximum success and thus develop a radical idea. Now the time has come for the teams to heighten creativity and accept the maximum risk. One possibility for the creation of a dark horse is to omit essential elements of a given situation, such as, "How would you design an IT service desk without IT problems?" "What does a windshield wiper look like without a windshield?" or "What would a cemetery look like if no one died?" The main point is to leave the comfort zone and "do it in any case," no matter what will occur.

Instruction: Give the group 50 minutes to build a dark horse and enough time for building a corresponding prototype depending on the task.

Ask the group to answer the following key questions:

- Which radical possibilities have not been considered thus far?
- Which experiences lie outside anything imaginable?
- Are there products and services that would expand value creation?


### (5) Implementation of a funky prototype to give free rein to creativity

In many cases, you have to go one step further because the team has not come up with disruptive ideas so far. The building of a funky prototype cranks up creativity one more notch. It encourages the teams to maximize the learning success and at the same time minimize costs in terms of time and attention. The goal is to develop solutions that mainly focus on the benefit. Potential costs and any budget restrictions are completely removed.

Instruction: Give the group an hour to build a funky prototype.

Ask the group to answer the following key questions:

- What crazy ideas are super cool?
- For which idea would you have to ask forgiveness in the end?
- What does an idea look like that is realized ad hoc and has not been planned?

### (6) Determine the vision of the idea with the vision prototype

The groan zone is the transition from the convergent to the divergent phase. The phases can be changed at any time. Experienced facilitators and innovation champions recognize this point in time and lead their teams in a targeted way to the convergent phase.
In the vision prototype, we make an initial combination of

- prior knowledge (caution is advisable here),
- best initial ideas,
- most important critical functionalities,
- new ideas of other industries and experience,
- initial user experience,
- intriguing insights (e.g., from the dark horse), and
- the simplest possible solution.

Instruction: Give the group about two hours (depending on the complexity of the problem) for building a vision prototype. It should then be tested with at least three potential users; the feedback is to be captured in detail. In the best-case scenario, these users are then involved in the subsequent concretization of the design thinking project. If so-called lead users are known in a field of innovation, they are perfect as references because they are often highly motivated to satisfy their needs.

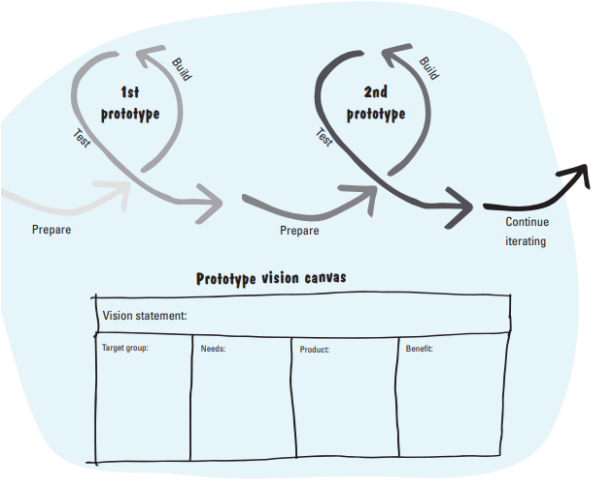
Ask the group to answer the following key questions:

- Does the vision generate enough attention so a potential user absolutely wants to use this solution?
- Does the vision give sufficient leeway for a user's dreams?
- Is the value offer of the vision convincing?
- What else would the users wish for in order to make the experience perfect?

# Hunt for next big market often follow these steps - Part 3 :

### (7) Concretize the vision step by step

In the following convergent phase, we want to focus on the concretization of the vision.
The theme of this phase is the specific elaboration of the selected idea. It is iteratively improved and expanded. It is advisable here first to build and test the most important critical functionalities as integral parts of a functional prototype. With this prototype as a starting point, more elements are supplemented and finally the prototype is built. Different ideas can be tested in the convergent phase, and the best ones are integrated into the ultimate solution. Individual features or various combinations can be developed and tested, for instance. Once the prototype has a certain maturity, we can describe it in a "prototype vision canvas." This way, we can formulate and compare various visions.




It is all about the iterative detailing and elaboration of the selected idea.
The maturity of the prototypes increases with every individual step.

### A. Functional prototype

With respect to the functional prototype, it is important to concentrate on the critical variables and test them intensively with potential users. Critical functions must be created for critical experiences. Not all functionalities must be integrated at the onset. The crucial point is to ensure minimum functionality in order to test the prototype under real conditions. These prototypes are frequently referred to as "minimal viable product" (MVP). These MVPs serve as a foundation to build upon, and step by step a finished prototype emerges that combines several functions.

### B. Finished prototype

The creation of a finished prototype is crucial for the interaction with the user, because only reality yields truth. Enough time must be scheduled for building a finished prototype, and the respective functionalities must be integrated.

### C. Final prototype

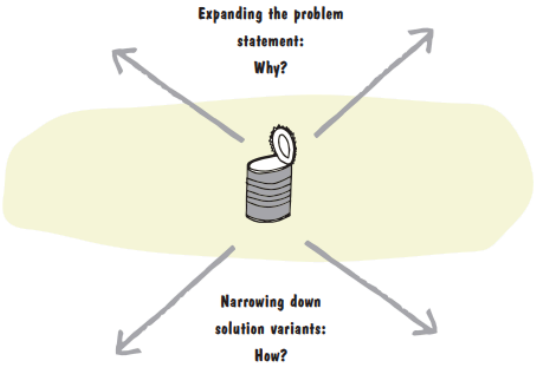
The final prototype excels by the elegance of the thoughts invested in it as well as in its realization. Prototypes that are convincing with simple functionality are usually also successful when launched on the market. It is advisable to obtain as much support from suppliers and partners in any and every possible way. The use of standard components increases the likelihood of success and massively reduces development costs.

## How to get a good problem statement :

Repeatedly asking "Why?" expands the creative framework; asking "How?" scales it down. In the Introduction, we briefly referred to the question of how we would tackle the issue of further training with design thinking. Designing a better can opener that everybody in the family likes using is another simple example of a design challenge.

To expand the problem statement, we pose the question of "Why?". Quickly we realize that repeatedly asking why brings us to the limits of our comfort zone in no time at all, so that we are actually moving toward earth-shaking and difficult-to-solve problems, so-called wicked problems. In terms of the can opener, examples of such problems are:

- How can we stop hunger in the world?
- How can we prevent so much food from being thrown away?




To narrow down alternative solutions, it helps to ask "How?" With regard to the can opener:

- How can the can be opened with a rotating mechanism? or:
- How can the can be opened without any additional device?

## Finding the design challenge :

How might we improve the customer-experience chain of places and things that are visited or used daily?

### Examples:

- How might we improve the online shopping experience of a shoe retailer?
- How might we improve the online booking portal for the car ferry from A to B?
- How might we improve customer satisfaction with the ticket app for public transport in Singapore?

Another possibility for getting to a design challenge is to change perspective. These questions help capture the design challenge:

- What if . . .?
- What might be possible?
- What would change behavior?
- What would be an offer if business ecosystems connected with each other?
- What is the impact of a promotion?
- What will happen afterward?
- Are there any opportunities where other people only see problems?

Another possibility is to take a closer look at an existing product or service (e.g., the customer experience chain when buying a music subscription). By asking questions and observing, we get hints for a design challenge:

- What does the music behavior of a user look like?
- How does the customer get information on new music offerings?
- How and where will the customer install the product or service?
- How does the customer use the product?
- How does the customer act when the product does not work as expected?
- How satisfied is the customer with the entire customer experience chain?

## Drawing Design Brief - A Design brief is the translation of a problem into a structure task :

**The design brief contains various elements and can provide information on core questions:**

**Definition of design space and design scope:**

- Which activities are to be supported and for whom?
- What do we want to learn about the user?

**Description of already existing approaches to solving the problem:**

- What already exists, and how can elements of it help with our own solution?
- What is missing in existing solutions?

**Definition of the design principles:**

- What are important hints for the team (e.g., at which point more creativity is demanded or that potential users should really try out a certain feature)?
- Are there any limitations, and which core functions are essential?
- Whom do we want to involve, and at what point in the design process?

**Definition of scenarios that are associated with the solution:**

- What does a desirable future and vision look like?
- Which scenarios are plausible and possible?

**Definition of the next steps and milestones:**

- By when should a solution have been worked out?
- Are there steering committee meetings from which we can get valuable feedback?

**Information on potential implementation challenges:**

- Who must be involved at an early stage?
- What is the culture like for dealing with radical solution proposals, and how great is its willingness to take risks?

**A design brief is the translation of a problem into a structured task:**

## Problem Statement - Key Learning :

- Question in the form of "Why?" and "How might we?" in order to grasp and understand the problem.
- Clarify what type of a problem it is: wicked, ill-defined, or well-defined. Adjust your approach accordingly.
- In the case of wicked problems, first find partial solutions for a partial problem. Proceed iteratively.
- Understand further partial aspects of the overall problem if it can't be understood at once, and iteratively add more solution components.
- Draw up a structured design brief so that the team and the client have the same understanding of the starting point.
- Make use of different possibilities of finding the design challenge (e.g., investigation of the entire customer experience chain or a change of perspective).
- Begin with the first iteration even if the ideal starting area has not been found yet. This way, the problem can often be understood better.

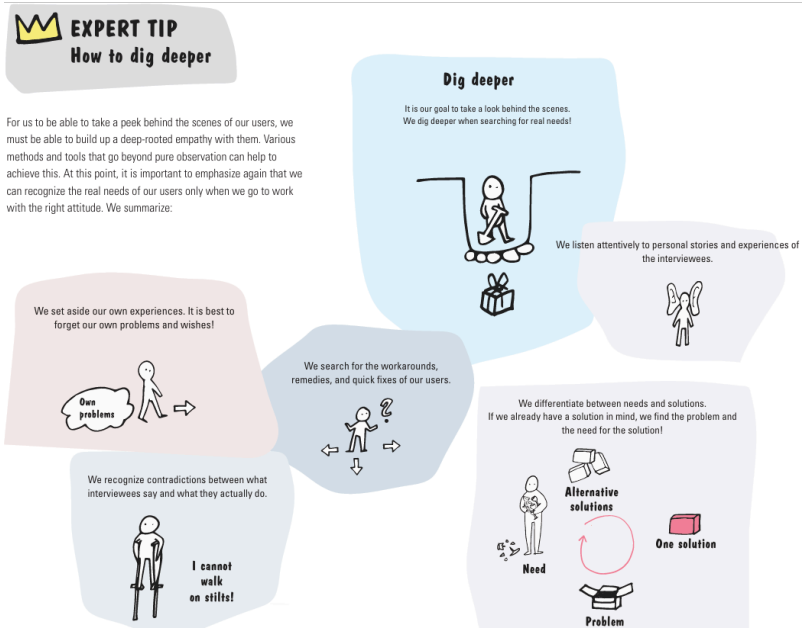
## How to discover user needs :

When was the last time we "walked in our customer's shoes."

When was the last time we mastered the daily grind at exactly the spot where our users are standing? If not for a whole day, then at least for an hour!

How do we know what our customers have difficulties with?
What are the reasons that our customers are happy?
What triggered the Wow! effect when they experienced our product?

## How to discover user needs - How to dig deeper :




## How to discover user needs - 6 WH Questions :

| What | Who | Why | Where | When | How |
|---|---|---|---|---|---|
| What is the problem? | Who is involved? | Why is the problem important? | Where does the problem occur? | When did the problem begin? | How could this problem be an opportunity? |
| What would we like to know? | Who is affected by the situation? | Why does it occur? | Where was it already resolved before? | When do people want to see results? | How could it be solved? |
| What are the assumptions that are scrutinized? | Who decides? | Why was it not yet solved? | Where did similar situations exist? | When can the project be started? | What has already been tried to resolve the problem? |

1. Create a set of WH questions.
2. Make a list of possible sub-questions.
3. Try to answer all WH questions.
4. If a WH question does not make sense in the context of the problem, skip it.
5. If the WH questions were used with the user in the context of a problem interview, try to dig deeper by probing and repeating questions.
6. Try to find more than one answer to every question. Conflicting answers can be of particular interest and should be amplified more deeply together with the user.
7. Evaluate the answers only at the end and filter the statements according to their relevance to the solution.

## How to discover user needs - Reflect on our own assumptions :

### First step: Reflect upon the user and the need. What have we learned in relation to the project?

We ask ourselves these project-related questions:

- How do people think and act in everyday life?
- What is done differently than we imagined?
- What surprises us ("Eureka!" moments)?
- Is there a need that is worth being solved?

### Second step: Is our solution the right one?

In a second step, we check whether our solution feels right. Is it really true that we don't have to change anything for our idea to work in everyday life? What would we change so that our innovation is used in everyday life?

### Third step: Were our approach and the kind of questions right?

In a final step, we check whether our approach was right. Did the way we posed our questions come across well? Was our documentation of any use later? This way, we see what was good, where we should improve things, and what we still should try out.

**Colors :**

The secondary colors are obtained by mixing the primary ones.

Red + Yellow = **Orange**; Red + Blue = **Purple**; Blue + Yellow = **Green**.

Tertiary colors are obtained by mixing **primary** and **secondary** colors.

A hue is the **dominant** family of a given color.

Tints, shades and tones are obtained by **mixing** a color with **white**, **black** and **grey** respectively.

The **CMYK** color model (cyan, magenta, yellow, black) is used for **printing**.

The **RGB** (red, green, blue) and **HSB** (hue, saturation, brightness) models are used in **digital** media.

A **complementary** color palette will give you the **most contrast**, while a **monochromatic** one will give you the **least contrast**.

## Common colors and their typical use cases in design:

Red:
- *Meaning:* Passion, energy, love, excitement.
- *Use Cases:* Attention-grabbing elements, calls to action, warnings.

Blue:
- *Meaning:* Trust, calmness, professionalism, reliability.
- *Use Cases:* Corporate websites, technology, finance, healthcare.

Green:
- *Meaning:* Nature, growth, freshness, tranquility.
- *Use Cases:* Environmental, organic products, health-related designs.

Yellow:
- *Meaning:* Happiness, optimism, warmth, creativity.
- *Use Cases:* Highlighting, attracting attention, promoting positivity.

Purple:
- *Meaning:* Luxury, sophistication, creativity, spirituality.
- *Use Cases:* High-end products, artistic and creative designs.

Orange:
- *Meaning:* Energy, enthusiasm, warmth, friendliness.
- *Use Cases:* Call-to-action buttons, highlighting important information.

Pink:
- *Meaning:* Femininity, romance, sweetness, playfulness.
- *Use Cases:* Products or designs targeting a female audience, romantic themes.

Brown:
- *Meaning:* Earthiness, reliability, warmth, simplicity.
- *Use Cases:* Natural or organic products, outdoor activities.

Black:
- *Meaning:* Elegance, sophistication, power, formality.
- *Use Cases:* Luxury brands, high-end products, minimalist designs.

White:
- *Meaning:* Purity, cleanliness, simplicity, neutrality.
- *Use Cases:* Medical and healthcare designs, minimalist designs, backgrounds.

Gray:
- *Meaning:* Balance, neutrality, practicality.
- *Use Cases:* Corporate designs, professional settings, technology.

Turquoise/Teal:
- *Meaning:* Calmness, sophistication, creativity.
- *Use Cases:* Modern designs, tech-related products.

Gold:
- *Meaning:* Luxury, wealth, success.
- *Use Cases:* Premium or exclusive products, celebratory designs.

**Ergonomics -** Ergonomics is the study of designing and arranging things people use so that the people and things interact most efficiently and safely. The goal of ergonomics is to enhance the well-being and performance of individuals by optimizing the design of products, systems, and environments. This field considers human capabilities and limitations and aims to create a harmonious relationship between people and their workspaces or tools.

## Key principles of ergonomics include:

- Physical ergonomics: Focuses on the human body's response to physical activities and the design of tools and equipment to minimize physical stress and discomfort.
- Cognitive ergonomics: Deals with mental processes such as perception, memory, reasoning, and motor response, ensuring that tasks are easy to understand and perform.
- Organizational ergonomics: Examines the optimization of work systems, including work processes, team dynamics, and organizational structures to enhance efficiency and well-being.
- Environmental ergonomics: Involves designing the physical environment to promote comfort, safety, and productivity, considering factors like lighting, temperature, noise, and air quality.

## Examples of ergonomic considerations in various settings include:

- Office Ergonomics: Designing workstations, chairs, and computer setups to reduce strain on the body during prolonged periods of sitting.
- Industrial Ergonomics: Designing tools and equipment in factories to minimize physical strain on workers and improve overall efficiency.
- Vehicle Ergonomics: Designing the layout and controls of vehicles to ensure comfort and safety for drivers and passengers.
- Medical Ergonomics: Designing medical equipment and workspaces to enhance the comfort and efficiency of healthcare professionals.

**Ergonomics in UX Design ⇒>** Ergonomics plays a crucial role in UX (User Experience) and product design, as it focuses on creating products and interfaces that are comfortable, efficient, and user-friendly. The goal is to design systems that work well with the capabilities and limitations of users, taking into consideration factors such as physical, cognitive, and emotional aspects. Here are some key aspects of ergonomics in UX and product design:

### Physical Ergonomics:

- Device Form and Size: Design devices and interfaces that fit well with the user's physical characteristics. Consider the size, weight, and form factor of devices to ensure ease of use.
- Reach and Accessibility: Place important controls and buttons within easy reach to minimize physical strain. This is particularly important for touchscreens and other interactive elements.

### Cognitive Ergonomics:

- Information Architecture: Organize information in a logical and intuitive manner to reduce cognitive load. Users should be able to easily navigate through the interface and find what they need.
- Consistency: Maintain consistency in design elements, terminology, and interactions across the entire product. This helps users build mental models and predict the system's behavior.

### Visual Ergonomics:

- Contrast and Legibility: Ensure proper contrast and legibility of text and visual elements. Consider factors like font size, color contrast, and background to make information easy to read.
- Visual Hierarchy: Use visual cues like color, size, and spacing to create a clear hierarchy of information, guiding users through the interface and highlighting important elements.

### Emotional Ergonomics:

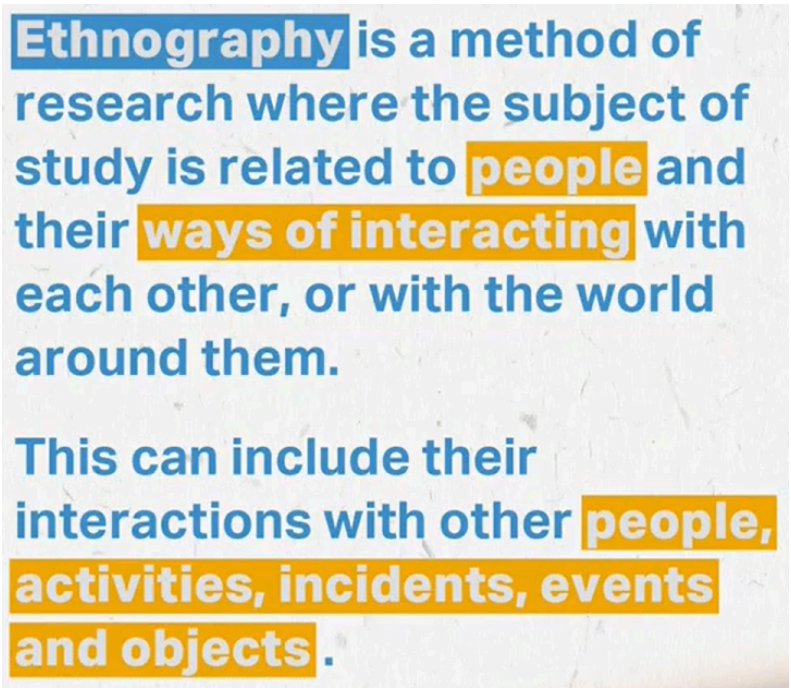
- Aesthetics and Branding: Consider the emotional impact of design elements. A visually appealing and consistent design contributes to a positive user experience.
- Feedback and Affordances: Provide clear feedback to users about the status of their actions. Design affordances that give users a sense of what actions are possible and how they can interact with the system.

### Usability Testing:

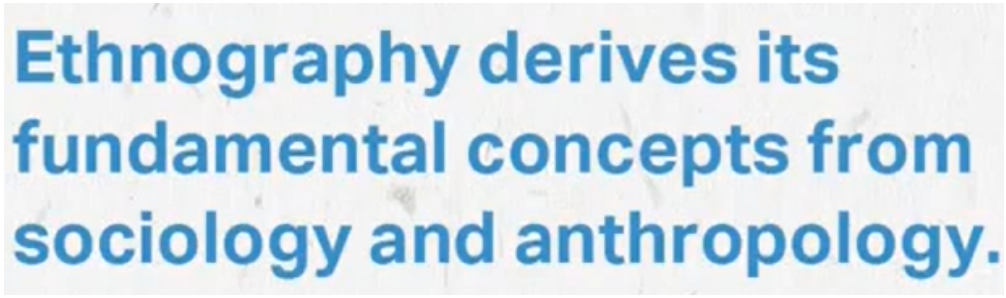
- User Feedback: Regularly conduct usability testing with real users to gather feedback on the ergonomics of your design. This helps identify pain points and areas for improvement.
- Iterative Design: Use an iterative design process, making adjustments based on user feedback and testing results to continually enhance the ergonomic aspects of your product.

### Accessibility:

- Inclusive Design: Ensure that your design is accessible to users with diverse abilities. Consider aspects such as screen readers, keyboard navigation, and other assistive technologies.




**Ethnography :**



**Ethnography ⇒>** Ethnography is a qualitative research method that involves the systematic study and observation of people and cultures in their natural environments. It originated in anthropology but has been adopted and adapted by various disciplines, including sociology, psychology, market research, and design. The primary goal of ethnography is to gain a deep and holistic understanding of a particular group of people, their behaviors, customs, beliefs, and social structures.

## Key components of ethnography include:

### Participant Observation:

- Ethnographers immerse themselves in the community or culture they are studying, actively participating in the daily lives of the people they are observing. This participatory approach allows researchers to gain firsthand experience and insights.

### Fieldwork:

- Ethnographic research often involves extended periods of fieldwork, where researchers spend significant time in the natural setting of their subjects. This could be a community, workplace, or any context relevant to the study.

### Interviews:

- Ethnographers conduct interviews with members of the community to gather information about their experiences, perspectives, and attitudes. These interviews can be both formal and informal, structured or unstructured.

### Note-Taking and Documentation:

- Ethnographers maintain detailed field notes, documenting their observations, interactions, and reflections. This documentation is crucial for capturing the context and nuance of the studied culture.

### Cultural Sensitivity:

- Ethnographers strive to be culturally sensitive and avoid imposing their own biases on the research. This involves understanding and respecting the cultural context in which the study takes place.

### Holistic Perspective:

- Ethnography aims to provide a holistic perspective by considering various aspects of a culture, including social dynamics, rituals, language, traditions, and everyday practices. This comprehensive approach helps researchers avoid oversimplification.

### Emergent Design:

- Ethnographic research often follows an emergent design, where the research questions and focus evolve based on the ongoing observations and discoveries in the field. This flexibility allows researchers to adapt to the dynamic nature of the studied culture.

### Thick Description:

- Ethnographers aim to create "thick descriptions" of the culture they study. This term, coined by anthropologist Clifford Geertz, refers to detailed, context-rich descriptions that go beyond surface-level observations to capture the deeper meaning behind behaviors and events.

**UX designers may start multivariate testing and let data lead the way until they hit a roadblock, then continue iterating until they achieve a satisfactory result.**

## Multivariate vs. A/B Testing - Multivariate testing is a great way to make incremental improvements to a design, rather than dramatic redesigns. Because it requires that you identify certain elements of interest on a page to test multiple variants of that variable, you cannot easily compare radical changes across variations. If your goal is to move towards a substantial redesign (such as major layout redesign), an A/B test to compare this new design against the current one is more appropriate than an MVT. Once the higher-performing design is discovered, use multivariate tests to further refine specific elements in the winning layout. ***For major redesigns, run an A/B test between the original and the proposed new version to find which is better. Then, refine various elements of the winning design using multivariate tests.***

## Product Design - Why are things the way they are : We can look at all designed items at three different levels. What level looks at the product as it appears to us, its properties and features. The how level looks at the interaction, what the product means to people, what it allows them to do, and what experience it evokes. The why level looks at the context, all the reasons and considerations why things are the way they are, and what makes products meaningful to people. These various reasons or considerations are called factors, and together they shape the reason for the existence of a design. Identifying these factors for an existing product or activity is a process of *deconstruction*.

**Product Design - Why should we design :** On the *design side* of the model, we reason from context (why) via the interaction (how) to the product concept (what). First you have to decide what factors to take into account in your new context: what is the set of reasons and considerations you want to work with? What is the effect, the experience, the behavior, you want to cause in the lives of the people you are designing for? When the factors are mainly found in technology, we speak of a technology push.When the factors are foremost based on market research, we speak of a market pull. However, in the human-centered design process that we advocate, the factors stem primarily from understanding people and the world they live in. No-one will tell you what factors are the ones you have to use. You, as a designer, have to decide what factors are relevant and interesting.

**Design process goes from reasoning from a context (Why), via the interaction (How) to the product concept (What).**

**Tangible Ecosystem Design** method is a workshop activity where the team works out different aspects of a concept using "tangibles", another word for physical objects. Instead of working on a wall or a whiteboard (real or virtual), they will gather around a paper-covered table where they can draw, use sticky notes and build 3D constructions with toy figurine tangibles.

# Six Thinking Hats:

1. **White hat** - the **information** hat: It considers objective facts and figures and is used at the meeting's commencement to secure everyone's understanding of all relevant information about the problem or issue at hand.
2. **Red hat -** the **emotion** hat: It is used to check the group's gut reaction to an idea or encourage the team to freely express emotions.
3. **Black hat -** the **judgment** hat: Critical and sceptical; it reveals the cautionary aspects of an idea or solution. Think of it as the "devil's advocate," whose role is to expose and mitigate risk.
4. **Yellow hat -** the **positive view** hat: Warm and positive, it focuses on the value of ideas. It acts as a counterbalance to the sceptical thinking of the Black Hat.
5. **Green hat -** is the **creativity** hat: It is all about generating new ideas.
6. **Blue hat -** the **thinking** hat: This pragmatic hat sets agendas and maps out the situation at the beginning of the meeting. It also returns at the meeting's end to summarize and formulate conclusions and insights.

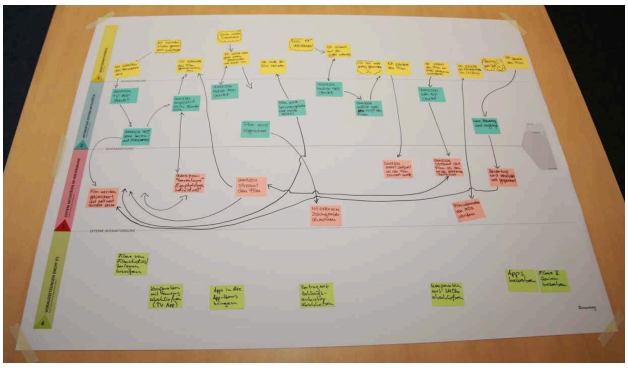
## Six Thinking Hats - Step-By-Step Guide :

1. **Write the problem statement as question on a whiteboard;**
2. **Draw a table with six columns, one for each thinking hat.**
3. **Have all participants start by wearing the white hat to discuss facts: what do we know about the subject? Etc.**
4. **Fill in the White hat columns with post-its, with comments framed as the White hat way of thinking.**
5. **Then, have them wear the blue hat to validate the problem and define it better.**
6. **And so on…..the red hat, the green hat, the black hat and the yellow hat…**
7. **Finish the process with the blue hat.**
8. **Finally, once all the hats have been worn and all columns have been filled, review each post-it and group like ones together to find common themes, concepts, or ideas.**

## Tangibles Ecosystem Design - TED method is imminently human-centered as it promotes acting out the potential solutions through toy figurine narratives (the "tangibles"). It was conceived specifically for a service design project, but TED can be applied to product design projects just as well; it is a large workshop-type activity, engaging participants in converging ideation (in seeking a single best solution) that accounts for a complex situation with multiple factors.

# Tangibles Ecosystem Design - Step-By-Step Guide

1. Split large group in 3-6 people teams (small enough so everyone has time to speak up);
2. Discuss, identify and mark down the chronological steps of the new typical scenario; the team must make sure the new scenario is realistic (i.e. specific enough to include all critical touchpoints and succinct enough to be workable); this can be done in a combination of sketching and sticky notes on a whiteboard (real or virtual);
3. Once the new scenario is established, on a different whiteboard or on a paper-covered tabletop, lay-out the steps of the new scenario;
4. For a Service Blueprint: split tabletop into four large swim lanes below the scenario steps:
    - Above the line of visibility, sharing the frontstage: User Actions and Interactive System Actions
    - Below the visibility line, in the backstage: System Actions & Hardware and Partnerships.



- **For a Customer Journey:** split table top in five swimlanes below the scenario steps:
    a. **Customer Actions**, **Thinking, Feeling & Experience**, **Touchpoints**, and **Opportunities**).
- Once the mapping is done, come back in the large group where each smaller team presents their scenario and map.

***Bodystorming -*** Everyone can run a bodystorming session. Bodystorming is a form of brainstorming through role-playing when we use our body to gain insights and experiences. For best results, prepare, observe and analyze the session. Bodystorming is extremely useful in mobility and the Internet of things (IoT). Imagine a mobile phone, google glass, new health gadgets. Using our body to act out situations and interactions help us to sense the world besides thinking about how we would sense the world during brainstorming.

## Design Kit - https://www.designkit.org/methods.html

**Psychology of UX Design - https://growth.design/psychology**