DESIGNING FOR HUMANS

HOW TO DESIGN UI AROUND THE BRAIN'S STRENGTHS AND WEAKNESSES

IMAGE SUPERIORITY

Tests showed that images are processed 60,000 times faster than text, and people could remember more than 2,500 pictures with at least 90% accuracy several days post-exposure, even though they saw each picture for just 10 seconds.

One of the reasons text is less memorable than images is that the brain sees words as lots of tiny pictures (the letters). And when we read, most of us try to visualize what the text is telling us, essentially creating images of objects or actions inside our heads.

Whenever possible, make use of iconography on actionable UI elements instead of purely text.

GEON THEORY

It's thought that there are 24 basic shapes that we recognize; these are called geons. They form the building blocks of all the objects we see and identify.

If you want people to quickly recognize an icon, use a simple geometric shape of the object. This will make it easier to recognize the underlying geons, and thus make the object easier and faster to recognize.

Favor 2D elements as 3D representations on the screen may actually slow down recognition and comprehension.

PHYSICAL CUES

Also known as "affordances", these are possible actions found in our environment.

A handle on a mug gives you a cue to put your fingers through it. A raised button gives you a cue to push it.

By giving users cues about what they can do with an object, you make it easier for them to figure out what to do with it.

Similarly, be careful not to give users "false affordances", such as a "button" that can't be pressed.

SALIENT CUES

Although there's a lot of detail on a penny, a lot of cues, the ones most people notice are color, size and someone's face. Those are the penny's salient cues.

Make each actionable item unique by enhancing its salient cues. That way the items are not mistaken for one another.

MENTAL MODELS

An individual's thought process of how things work is based on past experiences and sometimes on intuition.

If you enter a stranger's car, you will have a mental model of your own car and will expect features to be in similar places.

Never assume everyone has the same mental model as you. Do user research with your target audience to learn their unique mental model.

PERIPHERAL VISION

Early humans who were focusing on one task, and yet still noticed that a tiger was coming at them in their peripheral vision, survived to pass on their genes. Our brains can notice changes in our peripheral vision up to 1 sec faster than in our central vision.

If you want users to concentrate on a certain part of the screen, don't put animations or blinking elements in their peripheral vision. Conversely, if you want to catch their attention just place a blinking element near the edges of the screen.

MUSCLE MEMORY

When people repeatedly perform a series of steps, that action soon becomes automatic. This is because a goal-directed action recruits the frontal cortex while a habitual action uses a deeper subcortical structure, the striatum.

When changing order or placement of elements realize the trade-off is that people can make mistakes as they are in "auto-pilot".

Make it easy for people to undo not only their last action, but an entire sequence.

CATEGORIZATION INSTINCT

Just as learning a native language happens naturally, so does learning to categorize the world around us.

If there is a lot of information and it is not in logical categories, people will feel lost. Thus good information architecture is crutial to make the interface feel more intuitive.

Categories can be created simply by increasing space between items that don't go together and decreasing space between items that do.

WORKING MEMORY

People can only hold three or four things in working memory as long as they aren't distracted. So don't expect them to remember a step they took several screens back.

One of the interesting strategies employed to help our fragile memories is "chunking" information together into groups. It's no accident that U.S. phone numbers look like this: 712-555-4532

SENSORY DELIGHT

Delight can occur when an experience is faster, when there are less steps, and when there are more pleasant sensory inputs such as movement, haptics and sounds than were expected.

Although a certain amount of consistency is a good thing if people are trying to complete a task, providing novel and unexpected content and interactions is good if you want people to try something new, or if you want them to come back regularly.

NEED TO CONTROL

In the savannah control equals keeping out of danger and being self-sufficient. So when we lose control we can perceive that as a threat to our lives.

Try to balance good defaults and customizability to give users a sense of control.

If you want to increase autonomy, make sure your messaging is about having control and being able to do it yourself.

INATTENTION BLINDNESS

People can be so focused on a task that they often miss changes in their visual fields.

Don't assume that people will see something on a computer screen just because it's there. This is especially true when you refresh a screen and make a small change on it. Users may not even realize they are looking at different information.

To counter this, you can take advantage of Signal Detection Theory. Use our ability to detect other signals such as color change, size, animation and, sound to grab the user's attention back.

PAVLOVIAN REFLEX

When dogs (and humans) see food, they begin to salivate. Russian scientist Pavlov pairevd food with the sound of a bell. The bell was a stimulus. Every time the dogs saw food, they would also hear a bell, and they would salivate at the sight of the food. After a while the dogs would salivate at the sound of the bell, without the presence of food.

Pairing cues such as sounds with new information motivates people to seek it.

ATTENTION SPAN

7 to 10 minutes is about as long as we can pay attention to any one task before we start thinking about something else.

If you must hold attention longer than 7 to 10 minutes, introduce novel information or break it up into smaller steps.

PERCEPTION OF TIME

The perception of time and your reaction to it are greatly influenced by predictability and expectations.

To make a process seem shorter, break it up into steps and have people think less. It's mental processing that makes something seem to take a long time.

The goal-gradient effect says that you will accelerate your behavior as you progress closer to your goal.

Always provide progress indicators so users know how much time something is going to take. As they near the end remind them how close they are to reaching their goal.

MIRROR SYSTEM

Our brains have special cells called mirror neurons devoted to imitate and also empathize with others.

If you want to influence someone's behavior, or teach them something, then show an image or video of someone doing the same task instead of describing it with words.

TRIBAL TRUST

People are also "programmed" to pay special attention to friends and relatives. Social media around friends and relatives will be more motivating and garner more loyalty.

Show how your user's friends are using your product - their purchases, ratings, etc. They are likely to do the same.

COGNITIVE LOAD

The theory is that there are three different kinds of loads on a person's brain: cognitive (including memory), visual, and motor. Cognitive being the most expensive of them all, followed by visual and motor loads.

The brain can only consciously process a small amount of information at a time.

Making people think or remember (cognitive load) requires the most mental resources.

Look for trade-offs; for example, where you can reduce a cognitive load by increasing a visual or motor load.

Using progressive disclosure provide only the information people need at the moment, thus further reducing cognitive load per screen. More clicks trumps more thinking.

COGNITIVE DISSONANCE

Cognitive dissonance is the feeling you get when you have two ideas that conflict with each other. You don't like the feeling, so you'll try to get rid of the dissonance. There are two main ways you can do that: change your belief, or deny one of the ideas.

If you want people to join a community, you might find that people value it more if it's harder to join, such as having to meet certain criteria or being invited by others.

On the flip side, if a purchase is too hard to complete, the person may just "decide" they didn't want the item anyway.

ENNERGY EFFICIENCY

Humans have learned that they will survive longer and better if they conserve their energy. You want to spend enough energy to have enough resources, but beyond that you are wasting your energy.

Assume that people will get things done with the least amount of work possible. That may not always be the case, but it's true more often than not.

People will look for the good-enough solution rather than the optimal solution.