The laws of UX

Introduction

Psychology plays an important role in the world of UX design, despite the connection it's not always obvious for users how something works. In the world of UX design there are a few principles set up that you need to keep in mind before you start designing your project. There are also many psychological reasonings to keep in mind when making the UX, as designs can be perceived in a very different way by users then u think. I stumbled across the Product Designer Jon Yablonski, who created a very helpful website describing the maxims principles, it are psychological design principles that designers can use when building their interface. It's called the Laws of UX and I will be researching and summarizing them in this research. (Source 1.)

The 21 psychological design principles

Aesthetic usability effect

Users often perceive aesthetically pleasing design as design that's more usable.

Researchers Masaaki Kurosu and Kaori Kashimura from the Hitachi Design Center did their research on this principle in 1995. They tested 26 different variations of an ATM UI, asking 252 participants to rate each design on ease of use, as well as aesthetic appeal. They found a stronger correlation between the users ratings of aesthetics and ´perceived´ ease of use rather than the correlation between their ratings of aesthetics and ´actual´ ease of use. Kurosu and Kashimura have concluded with this research that users are heavily influenced by the aesthetics of any given interface, even when they try to find out the functionality of the system underneath. (Source 2.)

Doherty Threshold

Productivity soars when a computer and its users interact at a pace that ensures that neither has to wait on the other.

The research of 1982 of Walter J. Doherty and Ahrvind J. Thadani that was published in the IBM Systems Journal , which is a bimonthly peer-reviewed scientific journal covering information systems research. The system journal set the requirement for computer response to be 400ms, before this it had been 2000ms. When a user's command was executed and returned an answer in under 400ms, it was deemed to exceed the Doherty Threshold, and the use of the application was more likely to be "addicting" to the users. (Source 3.)

Fitts's Law

The time to acquire a target is a function of the distance to and size of the target.

Paul Fitts, a psychologist, was examining the human motor system in 1954. Which showed that the time needed to move to a target depends on the size and distance of the said target. His law concludes that fast movements and small targets result in greater error rates, because of the speed-

accuracy trade-off. His law is widely applied in UX and UI design. For example, Fitts's law influenced the buttons (especially on finger-operated mobile devices) to be larger as smaller buttons are more difficult and time consuming to press. Similarly, the distance between a user's task/attention area and the task-related button should be kept as short as possible. (Source 4.)

Goal-Gradient Effect
The tendency to approach a goal increases with proximity to the goal.

Originally proposed by the behaviorist Clark Hull in 1932. In a classic experiment that tests this, Hull found out that rats will run progressively faster when running in a straight alley as they went from the starting box to the food. This intents that the closer users are to completing a task, the faster they work towards reaching it. There has to be a clear indication of how far the progress is in order to motivate users to complete a task. (Source 5.)

Hick's Law
The time it takes to make a decision increase with the number and complexity of choices.

Hick's law was invented by the psychologist team of William Edmund Hick and Ray Hyman.in 1952 they examined the relationship between the number of stimuli present and an individual's reaction time to any given stimulus. This resulted in; The more stimuli to choose from, the longer it takes the user to make a decision on which one to interact with. Users bombarded with choices have to take time to interpret and decide, giving them work they don't want. (Source 6.)

Jakob's Law
Users spend most of their time on other sites. This means that users prefer your site to work the same way as all the other sites they already know.

Jakob's Law was coined by Jakob Nielsen, a User Advocate and principal of the Nielsen Norman Group which he co-founded with Dr. Donald A. Norman (former VP of research at Apple Computer). It includes that users will transfer expectations they have built around one familiar product to others that appear similar. (Source 7.)

Law of common region
Elements tend to be perceived into groups if they are sharing an area with a clearly defined boundary.

The principles of grouping are a set of principles used in psychology, first offered by Gestalt psychologists to account for the observation that humans perceive objects as organized patterns and objects naturally, a principle known as Prägnanz. It includes tat common region creates a better structure and helps users understand the relationship between elements and sections. This can be done by adding a border around an element or group of elements, or by adding a background to a specific section. (Source 8.)

Law of proximity
Objects that are near, or proximate to each other, tend to be grouped together.

The law of proximity is useful by allowing users to group different clusters of content at a glance. It helps to establish a relationship with nearby objects, as elements in close proximity are perceived to share similar functionality or traits. It helps users to understand and organize information faster and more efficiently. (Source 8.)

Law of Prägnanz
People will perceive and interpret ambiguous or complex images as the simplest form possible, because it is the interpretation that requires the least cognitive effort of us.

The human eye finds simplicity and order in complex shapes because our brain prevents us from becoming too overwhelmed with information. Research has confirmed that people are better able to visually process and remember simple figures rather than complex figures. The complex figures get simplified by the human eye by transforming it into a single, unified shape. The origin of this law came form the psychologist Max Wertheimer, who made a series of lights flash on a railroad, making it look like a single light goes through the lightbulbs. When in reality it's just a series of light bulbs going on and off. This observation led to a set of principles about how we visually perceive things. These principles are the heart of nearly everything we do graphically. (Source 9).

Law of similarity
The human eye tends to perceive similar elements in a design as a complete picture, shape, or group, even if those elements are separated.

This includes the fact that elements that are visually similar will be perceived as related. Think of color, shape, and size, orientation and movement, these things can signal that elements belong together and likely share a common meaning/functionality. It also includes that links and navigation systems should be differentiated from normal text elements. (Source 8.)

Law of Uniform Connectedness
Elements that are visually connected are perceived as more related than elements with no connection.

This law states that it's important to group functions of a similar nature by colors, lines, frames or other shapes so they are visually connected to each other. It is also possible to use a tangible connecting reference, such as lines and arrows, from one element to the other to create a visual connection. Uniform Connectedness is used to show context or emphasize the relationship between similar items. (Source 8.)

Miller's Law
The average person can only keep 7 (plus or minus 2) items in their working memory.

It is important that u organize content into smaller chunks to help users process, understand and memorize more easily. Though it is important to remember that short-term memory capacity varies per individual. In 1956, George Miller did studies on this subject, and asserted that the span of

immediate memory and absolute judgement were both limited to around 7 pieces of information. As it is a good standard to set it's also important not to use this guideline as a way to justify unnecessary design limitations. (Source 10.)

Occam's Razor
Among competing hypotheses that predict equally well, the one with the fewest assumptions should be selected.

The best way to reduce complexity is to avoid it by whole, it is important in the designing phase to analyze each element and remove as many as possible without ruining the overall function of the project. Occam's Razor is a problem-solving principle that, when presented with competing hypothetical answers to a problem, the one that makes the fewest assumptions should be selected. (Source 11.)

Pareto Principle
The Pareto principle states that, for many events, roughly 80% of the effects come from 20% of the causes.

A large group could contain only a few meaningful contributors to the desired outcome. It is important to focus most of the effort on areas that will bring the largest of benefits to most users. It's origins stem back to Vilfredo Pareto, an economist who noticed 80% of Italy's land was owned by 20% of the population. The 80/20 way of thinking can provide insightful and endlessly applicable analysis of lopsided systems, including user experience strategy. (Source 12.)

Parkinson's Law
Any task will inflate until all of the available time is spent.

Reducing the duration to complete a task from the expected duration will improve the overall user experience, this means that users have an expectation of how long a task will take and it's important that the task is completed before that expectation. This was articulated by Cyril Northcote Parkinson, he derived the dictum from his extensive experience in the British Civil Service. (Source 13.)

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.

Finding out where your product is most helpful, valuable or entertaining is very important and this should be designed to the delight of the user. Paying close attention to the most intense points and the final moments of the user journey could be very helpful. People recall negative experiences more than positive ones, so they will bring those up more. The origin of this rule comes from a 1993 study titled 'When More Pain Is Preferred to Less: Adding a Better End' by Kahneman, Fredrickson, Charles Schreiber and Donald Redelmeier. In this study they had two different trials, the first one they had subjects that had to submerge their hand in 14°C water for 60 seconds. In the second trial they had to submerge their hand in 14°C water for 60 seconds with an additional 30 seconds in 15°C water. When askes which of the two trials they liked the subjects told they liked the second experience

better despite the prolonged exposure. The researchers concluded that "subjects chose the long trial simply because they liked the memory of it better than the alternative" (Source 14.)

Postel's Law

Be liberal in what you accept, and conservative in what you send.

This law includes that you should be flexible about the various actions the user could take, the more we can anticipate and plan for in design, the more resilient the design will be. It is important to accept variable input from users and to translate that input to meet your requirements so that you can provide clear feedback to the users. This law was formulated by Jon Postel, an early pioneer of the internet. (Source 15.)

Serial Position Effect

Users have a propensity to best remember the first and last items in a series.

Placing the most important items in front and back can be helpful as these items tend to be stored better in the memory of users, unlike the items that you put in the middle of things like lists. Positioning key actions on the far left and right within a element such as navigation can increase the memorization. It's a term coined by Herman Ebbinghaus, and describes how the position of an item in a sequence affects recall accuracy. (Source 16.)

Tesler's Law

Tesler's Law, also known as The Law of Conservation of Complexity, states that for any system there is a certain amount of complexity which cannot be reduced.

All projects have a core of complexity within them, this cannot be designed away and it must be assumed by either the system or the user. You shouldn't simplify the interface too much to the point it's just abstract. The law was made by Larry Tesler and he argues that, in most cases, an engineer should spend an extra week reducing the complexity of their application rather than making the users spend an extra minute using the program because of extra complexity. (Source 17.)

Von Restorff Effect

The Von Restorff effect, also known as The Isolation Effect, predicts that when multiple similar objects are present, the one that differs from the rest is most likely to be remembered.

Making important information or key actions visually distinctive makes it stand out more thus being more attracted to by users. This effect includes that you should use a restraint when placing emphasis on visual elements so that you can avoid them competing with one another and to ensure that important items don't get mistakenly identified as something they're not. It's also good to keep in mind that you shouldn't exclude people with color vision deficiency or low vision by relying completely on color. This theory was made by German psychiatrist and pediatrician Hedwig von Restorff. She found out that when people where presented with a list of categorized similar items with one distinctive, memory of that item was improved. (source 18.)

Zeigarnik Effect

People remember uncompleted or interrupted tasks better than completed tasks.

Providing progress towards a goal will help users ensure to have more motivation to complete the task. Make a clear indication of progress in order to motivate users to complete a task. There should be clear signifiers of additional content. The effect was studied by Bluma Wulfovna Zeigarnik, who was a Soviet psychologist and psychiatrist. She conducted a study on memory, in which she compared memory in relation to incomplete and complete tasks. She found out that incomplete tasks are easier to remember than successful ones. (Source 19.)

Sources

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