THE HAGUE
UNIVERSITY OF
APPLIED SCIENCES

Communication & Multimedia Design
USER EXPERIENCE DESIGN
Academic Year
2018 - 2019

Weekly Diary

Psychology of Experience

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Introduction

This personal blog is part of the course of User Experience Design taught on the Hague University of Applied Sciences. The objective if this personal blog is to reflect on how to create a good user experience and user interface. It is important to have knowledge of the human mind and how it works in order to make a UI that is pleasant to use.

Every week it includes guidelines related to the chapter reviewed that week. In the course we learn about user interface which we make guidelines for every week, my guidelines were taken straight from the “Design with the mind in mind” book, these guidelines are in accordance with how the brain interprets the world.

Week One
Our Perception is Biased

Perception >

NEW THINGS DISCOVERED AND NEVER REALIZED

This week I learned about the new concept of GESTALT, and I never realized just how much our brain works with structure. Not long ago I wrote an essay on how humans are pattern-seeking animals and how we learn to survive through seeing and learning patterns. But it was new to me to see how much even with small things in our daily lives (such as how a supermarket is organized) we use patterns.

THIS IS WHAT I LEARNED ABOUT THIS WEEK

I learned that what we perceive is not an accurate reflection of our environment, and this is because we are biased to our: past experiences, present context and future goals. Experiences in the past can influence what you see because when your perceptual system has been primed to see a certain thing, that is all you will be able to see until someone or something tells you otherwise (illusionist use this concept to their advantage to trick and create illusions as seen below).

For example this image just looks like many dots put together randomly, this is because the brain can not relate it to something it has seen before. After you are told that it is a Dalmatian sniffing around a tree only then your visual system organizes it into a coherent picture. Priming is not only visual but can be implemented to other perceptions as well, it is basically what makes us bias.

As pattern seeking animals we like to seek and be in environments where we can find patterns that are familiar to us, this is because it is familiar and familiarity makes us comfortable. For example we could probably navigate our homes in the dark and still know where we are going, this is the same as the route we take to school or to work.

We also create mental frames for certain situations or concepts, what I mean is that you would probably expect a bedroom to have a bed, and you would expect a shower or bath in a bathing room. These are called mental shortcuts, these eliminate the constant need to focus on our environment and help us navigate easily, unfortunately these mental frames can make us see things that might not be there.

We can also be perception biased by current context, this is seen in, for example, the McGurk effect. When someone is talking we tend to look at their mouth to find a more accurate input of what they are saying, when that fails it is called the McGurk effect. When this happens we start hearing the syllables indicated by the speakers lip movement. Only by not looking at the persons mouth you will be able to hear the correct syllables.

In addition to being bias by current context you can also be bias by future goals. For example things unrelated to our goals will be filtered out unconsciously in that moment. What this means that if your goal is to find a certain objects and there are other objects around it, you will unconsciously not notice the other objects because they are irrelevant at that moment.

Prosopagnosia

I wanted to know more about how its possible to not recognize faces and I found it:

- On youtube | https://youtu.be/Hlag84X7BsE
- Section from a professional book | https://www.sciencedirect.com/science/article/pii/002839329500002K?via%3Dihub

THIS IS WHAT I FOUND:

I first heard of this illness was from a television series and I didn't think it was real, that was until our lecturer mentioned it in class. I became curious and decided to look it up and this is what I found:

The disorder is called Prosopagnosia and it is the inability to recognize faces even though their vision is fine. People this this disorder can see individual parts of a persons face (like the eye, nose, hair) but they can not make meaning out of it and store it in their memory. There are two types, one can be developed from a very young age and the other is due to brain damage or trauma.

THIS IS HOW I CAN USE FACIAL RECOGNITION IN USER EXPERIENCE DESIGN:

Now a days there are a lot of face-recognition devices such as the iPhone, iPad etc... These can be used to make make using the devices faster, like not needing to input a password or your finger print every time you want to pay for something. I think you could use face recognition as an accurate dictation software, because we do have a built in microphone but many times

because of accent or dialect, the phone does not register the words/sentences right, I think devices could benefit greatly from facial recognition.

Why is our perception bias?

Rule 1 >
Things unrelated to our goals get filtered out

Rule 2 >
We are wired to perceive our surroundings in terms of whole objects

Rule 3 >
Our visual system is biased to see objects and visual hierarchy

Week Two
Our Vision is limited

Perception >

NEW THINGS DISCOVERED AND NEVER REALIZED

This week I learned about the new concept that when we see color that it is not actually there but the color you see is what is not absorbed by the object or thing you see. I also learned new that birds can see radio waves apart from seeing normal colors which i find fascinating.

THIS IS WHAT I LEARNED ABOUT THIS WEEK

Our eyes can fool us, what we see is not what there is in the world:
In class we saw how our peripheral vision is limited and that we cant fully rely on it, but we do need it. But not only is our peripheral vision limited but also our ability to detect differences between colors is also limited.

The reason this happens is because of how our visual system works, first our vision is not optimized for contrast not for brightness and there are three other presentation factors that also effect our ability to distinguish color:

- Paleness: The paler the colors are the harder they are to distinguish between them.
- Color patch size: The smaller or the thinner the object the harder it is to detect color, like on words.
- Separation: The more separate colors are the more difficult it is to distinguish.

Our Eyes Fool Us

I wanted to know more about "The Dress" and I found it:

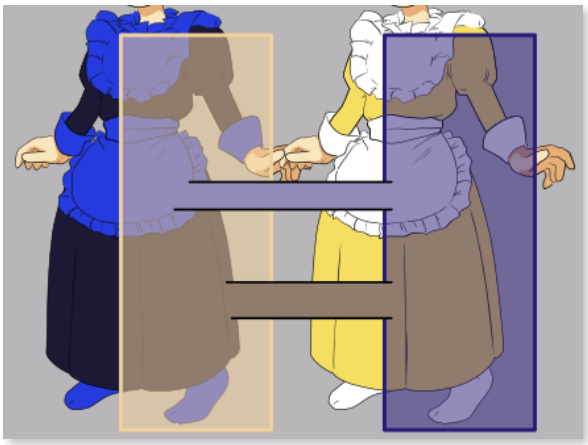
- On youtube - https://www.youtube.com/watch?v=AskAQwOBvhc
- Article - https://www.wired.com/2015/02/science-one-agrees-color-dress/

THIS IS WHAT I FOUND:

A couple years ago a picture of a dress circled around social media and people could not decide whether the dress was black and blue or white and gold.

When it comes to “The Dress” it just depends on the context that you see the dress. If you look at the picture you see that there is not much color context in the picture because it is so zoomed in. So the color you will see depends on the individual perception and the environment in which you’re looking at the photo.

According to a study they found that:



The dress can be interpreted in two ways:
* Black and blue under a yellow-tinted illumination (left figure) or
* White and gold under a blue-tinted illumination (right figure).

People who see white and gold may be looking at the dress in a blue-lit room or near a window with a blue sky. People who see the correct black and blue might be looking at the dress somewhere with artificial, yellow-lit lights. Some think that it has to do with the person who’s looking psychology and light might not have so much influence.

THIS IS HOW I CAN USE ILLUSION IN DESIGN:
This is already seen a lot but elusion is used very often in video games. They make the illusion that things that are not really there appear as if they are. This is seen in VR, as technology evolves so does the VR world, if you put on a VR set; the way they make the graphics seem and the smoothness of the frames per second makes the user believe that he is in that world and it totally immerses users into an illusion. I want to be able to make design that reflect this kind of immersive experience in the future so that users can enjoy the full extent to their video games.

Why Do Our Eyes Get Fooled?

Rule 1 >
Our ability to distinguish and see colors depends on how they are presented.

Rule 2 >
Our vision is optimized for contrast not brightness.

Rule 3 >
The resolution in the center of our visual field is much higher than at the edges.

Week Three
Our Attention and Memory is limited

Memory & Attention >

NEW THINGS DISCOVERED AND NEVER REALIZED

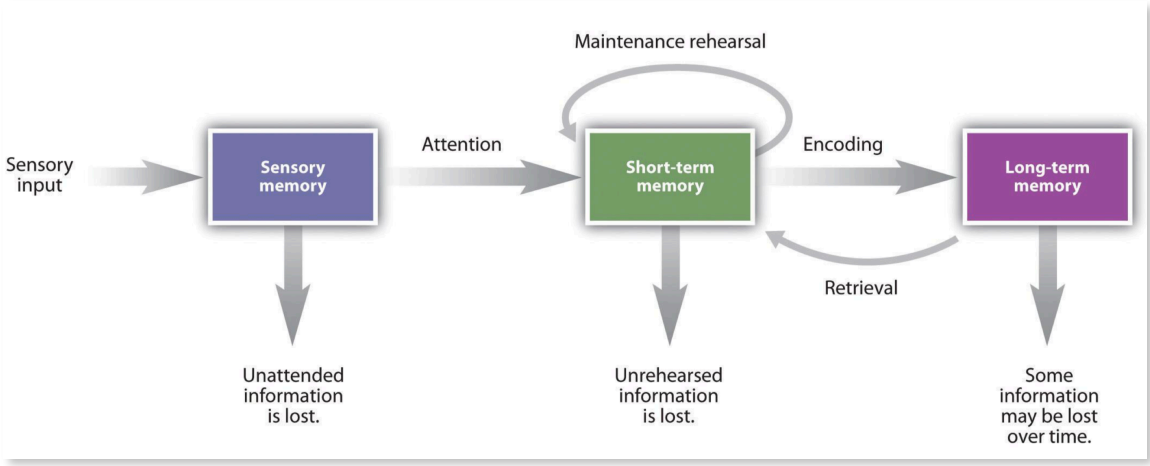
I discovered new that people reconstruct memories each time they remember them. I also learned that memories are nerve paths that fire again every time we remember an event. I found this particularly interesting because I wonder if we can actually trust our own memory?

THIS IS WHAT I LEARNED ABOUT THIS WEEK

We thought for a long time that memory is stored like in a library. That the memories we forgot were just stored in the wrong cabinet, but this is in fact wrong. In reality there is a lot happening in our brain related to memory and we dont fully understand it yet.

When we focus on how working memory works, what is happening is that when people preform tasks that involve the working memory, the prefrontal cortex (which focuses on attention) lights up on an fMRI scan. People with a more concentrated working memory have higher academic success.

The longterm memory on the other hand works to connect new concepts to those previously learned. This is because we have certain concepts that help us understand new things.



Long term memory is...

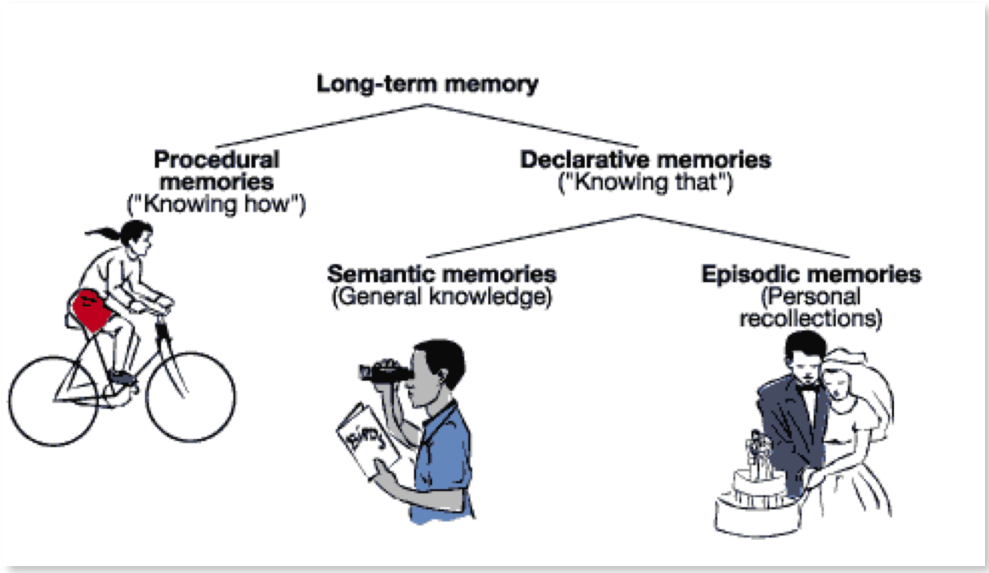
- Error prone.
- Weighted by emotions: The emotions influence a lot in memory.
- Retroactively alterable: You can change memory. They do this a lot with people who are traumatized.

The thought cycle:

1. Goal - Provide clear paths
2. Execute - Provide clear information scent
3. Evaluate - Provide feedback

Longterm Memory | Semantic, episodic and procedural memory:

Long term: Fathers b-day, where you live, the way to work. All the bellow:
semantic: The memories we store which is common knowledge. ex. Paris is the capital of France.
Episodic: Personal recollections. The last time I did this…
Procedural: How to walk, how to play the piano, how to do things.



(People with memory loss might not remember their past memories but their muscles often remember certain movements still (muscle memory).)

People remember only four items at once in working memory as long as they are not distracted and the processing ion information is not interfered with. An example as to how we combat this is how we group phone numbers, instead of having 10 digits all together we chuck the 10 numbers in fours or less.

People remember only four items at once in longterm memory as well, there was a test made where people could perfectly retrieve 4 items out of every category shown but as soon as there were more than 4 items it was evident that the memory started failing.

How to Erase Memories of Pain and Fear

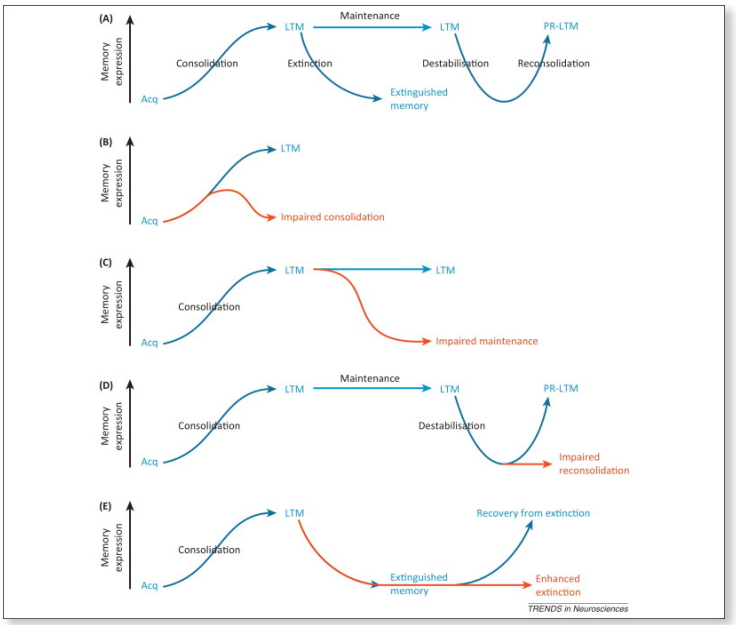
I wanted to know more about how our memory can be erased, and I found it:

- Scientific Journal - https://www.sciencedirect.com/science/article/pii/S0166223613000519

THIS IS WHAT I FOUND:

We have a strong dislike for experiences that involve pain and fear, these although disliked have a strong impact on our behavior and well being. They play a strong role in telling us wether something is safe to do or not, however if they are expressed under inappropriate circumstances it can have a negative impact on the wellbeing of a person.

Excessive fear is a characteristic of anxiety disorders. Moreover, it can be argued that there is a link between a specific aversive experience and the resultant anxiety for several disorders.



Conditioning low-frequency stimulation (LFS) of primary afferents at C-fibre intensity induces LTP at C-fibre synapses and modifies the phosphorylation state of AMPA receptors. So, the specific reversal of these postsynaptic memory traces of pain may comprise normalizing the phosphorylation state of AMPA receptors in the spinal dorsal horn and, indeed, it has been recently discovered that this can be achieved.

HOW CAN I MAKE ATTENTION AND MEMORY BETTER IN DESIGN:

Our attention and memory sucks.

Rule 1 >
We notice things when they are related to our goals.

Rule 2 >
Include no more than four items in each chunk.

Rule 3 >
Repetition makes information stick. Practice makes perfect.

Week Four

Reading is Unnatural. Our Memory is Imperfect

Reading & Conditioning >

Memory

NEW THINGS DISCOVERED AND NEVER REALIZED

I recently learned that memory is linked with perception.

THIS IS WHAT I LEARNED ABOUT THIS WEEK

The same way human attention and memory, like vision, have strengths and weaknesses. Memories are formed through neuron activity patterns, which make patterns easier to reactivate in the future. To activate memory you need to reactivate the same pattern of neural activity that happened when the memory was formed.

Recognition: When someone sees something that looks very similar to something have seen before.

Recall: when you remember something your saw/heard, without having seen/heard anything similar.

The more often a memory is jogged:

- The stronger it becomes.
- The easier it is to recall it.

THIS IS HOW I CAN MAKE REMEMBERING EASIER IN DESIGN

Basic things in a user interphase should help people remember things better such as:

- Let users assign and give meaning to the same gestures so that users dont have to remember as much.
- Let devices have more functions than controls.

Reading

NEW THINGS DISCOVERED AND NEVER REALIZED

This week I learned about how reading is unnatural, this is because humans are prewired to learn spoken languages, but not to learn how to read. I also learned about conditioning and how we learn throughout our lifetime.

THIS IS WHAT I LEARNED ABOUT THIS WEEK

Only over thousands or maybe millions of years, the human brain could evolve into being able to speak a language. Because those neural systems were developed now it is passed on to

new born baby which dont need any systematic training. Although by adolescence we do need to learn language like any other skill, through training and practice.

Feature-driven reading (Bottom-up Reading):
Our visual system identifies Simple features such as Lines and curves and turns them into more complex features which the brain
recognizes as characters representing letters.

Context-driven reading (Top-dow reading):
the visual system starts by recognizing patterns such as words and phrases. And then it starts guessing what the components are. Based on what we have already read and our knowledge of the world, our brains sometimes predict text that we have not read yet, allowing us to skim over it.

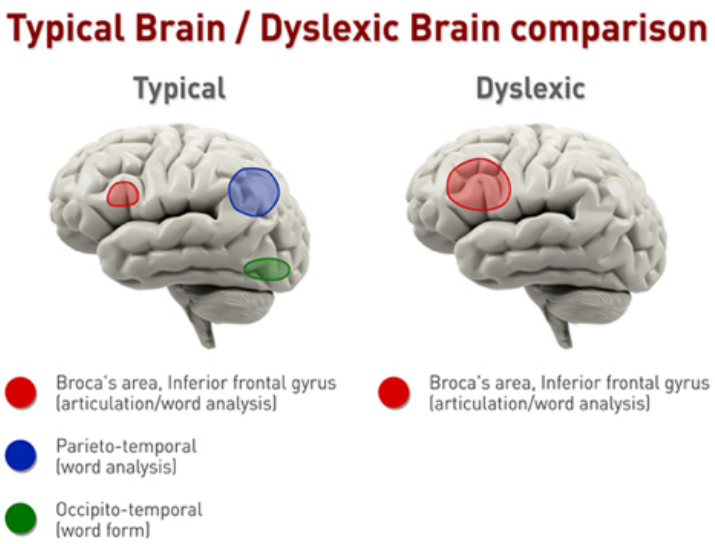
Our visual system recognizes words based on their shape and then determines what Letters they have. Context and feature driven reading work in parallel, although context-driven reading is considered as a backup.

Dyslexia

Because reading is natural to us, but to some more than others, I wanted to know how exactly dyslexia works, and I found it.
youtube video - https://www.youtube.com/watch?v=zafiGBrFkRM
Research Article - https://onlinelibrary.wiley.com/doi/abs/10.1002/dys.185

THIS IS WHAT I FOUND:
Dyslexia is a common learning difficulty that can cause problems with reading, writing and spelling. According to studies dyslexia seems to run in families and theres no known cause for it. its a thought that genes inherited by parents connect in certain ways that effect the development of your brain.

A PERSON WHO HAS DYSLEXIA MIGHT SEE SIGNS SUCH AS:
- Confuses the order of letters in words.
- Can understand verbal information better that written information.
- Have inconsistent spelling.
- Have struggles with planning and organization.



Usually people know if they have dyslexia when they are in primary school. This is because in that period of a child's life is when they start learning how to read and write. If a child has dyslexia usually schools offer extra help.

THIS IS HOW I CAN MAKE READING EASIER IN DESIGN:

There are couple things you can do to make it easier for people to read text when designing for them for example:

1. Don't use way too difficult words.
2. Do not use small fonts.
3. Don't put text of messy backgrounds.
4. Do not use centered text.
5. Try to use consistent vocabulary through the design.
6. Make visual hierarchy's.

Our brain is imperfect

Rule 1 >
We are wired for language. Not for reading.

Rule 2 >
We focus our goals and pay little attention to our tools.

Rule 3 >
Design for everyone. Just because you can read it doesn't mean everyone can.

Week Five
Learning and Decision Making

How do we learn >

NEW THINGS DISCOVERED AND NEVER REALIZED

It turns out we make strange mistakes, we tend to exaggerate because we cant see everything. It is part of the automatic part of our brain, we tend to believe things from what we already know.

THIS IS WHAT I LEARNED ABOUT THIS WEEK

The way we learn. We have three brains:

The new brain: The one we share with mammals (rational).
It turns out we make strange mistakes, we tend to exaggerate because we cant see everything. It is part of the automatic part of our brain, we tend to believe things from what we already know.

The middle brain: Regulates emotions.

The reptilian brain: Purely for instinct.
Can I eat it, can I be eaten by it, can I have sex with it (instinctual).

WE HAVE TWO MINDS:

Thinking fast and slow by Daniel Kahneman. When they observed people they realized they are not rational thinking people.
One is the fast thinker and one is slow: system one (unconscious actions/ need little thought)
Fast means you dont need to think so much about what you are doing (automatic pilot).
(system two) slow thinking: we dont use it because we are very lazy, takes more brain power.

WHEN DO WE LEARN?

Learning from experiences is easy. Mirror-neurons: When we see someone fall we can feel their pain. They are there from when you are born, you can see this with babies, they usually

react similarly to their parents because they learn from them (unconscious mimicry).

It's important for humans to be able to mimic, because its lets us learn quickly and gain empathy for others.
Learning form experience is easy but not perfect. Because not every solution to every situation can be applied to other situations.

WHEN DOES IT STICK?

Preforming novel actions is hard, because you need to train yourself in new ways, and you need to make your own system and after a while we start to do it automatically, you need to actively call upon the system. Preforming learned actions is easy, like reading and writing which are basically muscle memory (auto pilot)

IMPLICATIONS FOR INTERFACE DESIGN:

- Guide users towards their goals.
- Tell users explicitly and exactly what they need to know.
- Let people use perception rather than calculation.
- Make the system familiar.
- Let the computer do the math.
- Use external memory aids like: Planners, apps, reminders.

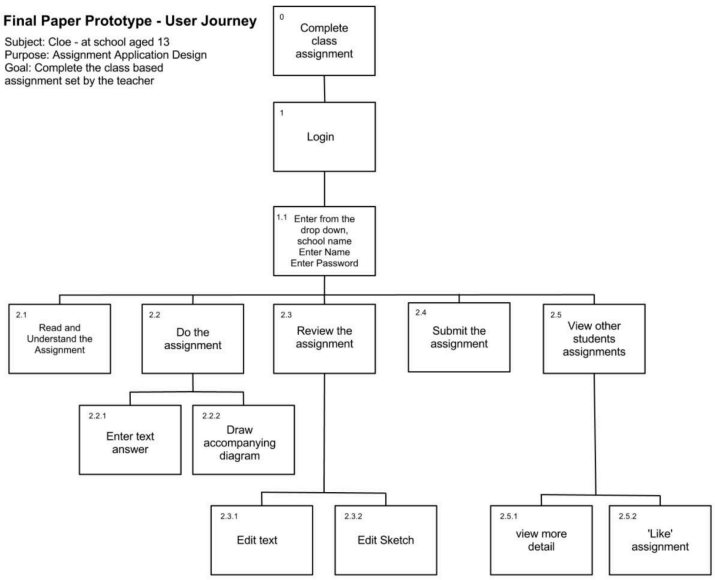
WE LEARN FASTER UNDER THE FOLLOWING CONDITIONS:

- Practice is frequent, regular and precise.
- Operation is task-focused, simple and consistent.
- Vocabulary is task-focused, familiar, and consistent.
- Risk is low.
- In order to not forget:
- Practice should be frequent, regular and precise.

OPERATION IS TASK-FOCUSED, SIMPLE AND CONSISTENT

IMPLICATIONS FOR THE DESIGNER:

1. Perform a task analysis.
2. Build a conceptual model based on 1.
3. Design an interface based on 1 en 2.



CONSISTENCY IS KEY WHEN LEARNING:

- Subscription.
- Access.
- Membership.
- Entitlements.

(e.g. Always put the delete button in the same place so people can make a mental model out of the website you've made.)

TO SUMMARIZE: HOW DO WE LEARN (FASTER)?

- When practice is frequent, regular and precise.
- Operation is task-focused, simple and consistent.
- Vocabulary is task-focused, familiar and consistent.
- Risk is low.

THE FEAR OF LOSS IS MORE IMPORTANT THAN GAIN. WE OVER EXAGGERATE HOW BAD IT IS TO LOOSE SOMETHING. (e.g. Trump uses the word "loose" to make people vulnerable against)

We are biased by how choices are worded. HOW DO WE CHOOSE?

- People don't make rational choices.
- Fear of loss is more important than gain.

- Framing effect: we are biased by how choices are worded.
- Memories and imaginations influence our choices.

DECISION SUPPORT SYSTEMS VERSUS PERSUASIVE SYSTEMS:

- Decision support systems are objective.
- Persuasive systems tell a story, use memories and emotions.

I WANTED TO KNOW MORE ABOUT HOW OUR MEMORY CAN BE ERASED, AND I FOUND IT:

youtube video - https://www.youtube.com/watch?v=89shevn24L8
Article - https://www.sciencedirect.com/science/article/pii/S0166223613000519

THIS IS WHAT I FOUND:

Each time, we reflect on a memory you're literally physically changing that memory in your mind and each time that memory is altered a little reflecting on your current thoughts. Remembering is an act of creation. And imagining, meaning, the more, you reflect on old memories, the less accurate. According to a source hundreds of people were asked about their memories of a dreadful day and a year later when asked 37 of the details had changed. By 2004, nearly 50 of the details had changed or gone missing.

Scientists tried using a protein inhibiting drug on mice which actually worked. So if memories are formed and rebuilt every time you remember them, if you administer the protein inhibiting drug while, recalling a memory, the memory can be forgotten.

HOW CAN I MAKE ATTENTION AND MEMORY BETTER IN DESIGN:

- Don't make users memorize many items at once.
- Don't present too many elements for the choice together.
- Save memory effort with recognizable patterns and symbols
- Apply consistent markers in navigation
- Don't hide the core elements of navigation
- Stimulate different types of memory

We have a hard time learning

Rule 1 >
We learn faster when Practice is Frequent, Regular, and Precise.

Rule 2 >
We Learn Faster when Operation is Task Focused, Simple, and Consistent

Rule 3 >
We Learn Faster when Vocabulary is Task Focused, Familiar, and Consistent

Week Six
Hand-eye coordination, time requirements

Timing is everything >

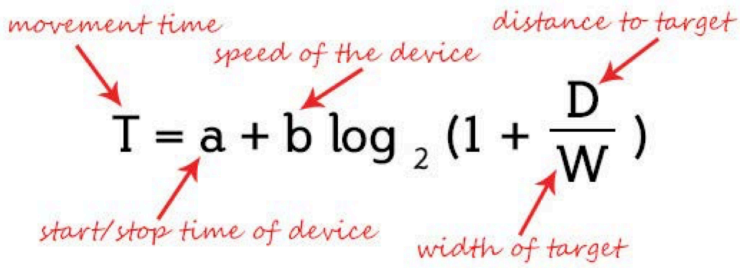
Hand-eye coordination

NEW THINGS DISCOVERED AND NEVER REALIZED

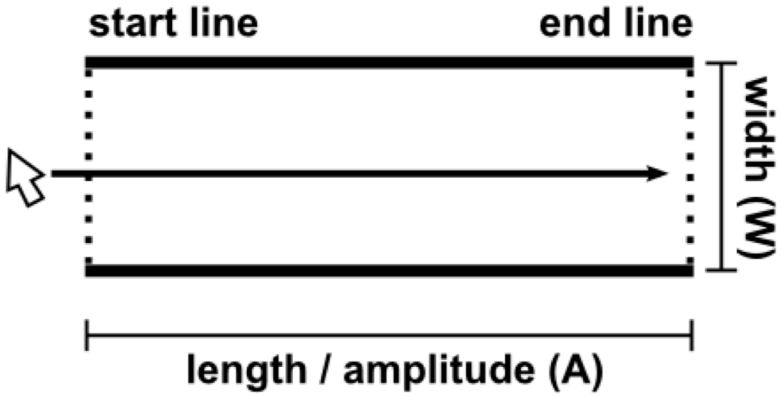
Apparently pointing at objects and for example when we move our mouse is actually a path that follows consistent qualitative laws.

THIS IS WHAT I LEARNED ABOUT THIS WEEK

This week I learned about Fitts' law: This is the law that says the the bigger the target on your screen and the closer it is to your starting point the faster you will reach it.



I also learned about Steering law: which is the law that tells you if you must keep a pointer within a certain area, the wider the area, the faster you can get your pointer to the desired location.



THIS IS HOW I CAN MAKE IT EASIER FOR USERS TO POINT AT SOMETHING AND CLICK IT FASTER IN DESIGN:

- Make where you're supposed to click as big as the visible target area clicking.
- Make the labels attached to checkboxes, buttons, and switches clickable as well.
- Put important clickable targets near the corners of the screen so that they can cannot be easily missed.
- Make targets big enough so that people can easily click them.

TIME REQUIREMENTS

NEW THINGS DISCOVERED AND NEVER REALIZED

I discovered that we experience time strongly, for example when you're having a good time, time goes quick but if you are having a bad time, time goes slow. She it comes to technology, if our systems are not in coordination with our time requirements we find these systems less effective and we see them as unresponsive.

THIS IS WHAT I LEARNED ABOUT THIS WEEK

What I learned this week is that it is very important for a system to coordinate with human time requirements, because user satisfaction is dependent on a systems responsiveness. If a system preforms unexpectedly we assume there is something wrong about the systems status.

Responsiveness: This is measured in terms of how well it can keep up with human time requirements and how satisfied the user is.

The reason responsiveness is so important is because even if the system cannot fulfill the users requests immediately, it at least keeps the user informed about their request. It a way of providing feedback about what has been asked and what is happening.

HUMAN BRAIN CONSTRAINTS

Human functions such as our: sensory, regulatory, cognitive and motor functions, are not really a single organ. These functions operate at different speeds.

I WANTED TO KNOW IF WE CAN CONTROL OUR TIME REQUIREMENTS IN OUR HEADS , AND I FOUND IT:

youtube video - https://www.youtube.com/watch?v=Bt-yQOhs2Vk

THIS IS WHAT I FOUND:

According to sources we have the power to slow time down. According to the research of neuroscientist, David Eagleman, this isn't just science fiction fantasy. This power is real and it's found in the difference between clock time and brain time clock time exists outside of us.

Brain time is shaped by our perceptions, brain time can fly by or drag on. Our brain records, the events of our lives, laying down data on a memory track as you experience things in the moment like a car crash, a kiss, or a raise. England's experiments showed that repetitive patterns caused brain activity to fall while new things makes it spike. The secret to slowing time down is to fill your days with as many new things as possible, memorable experiences give your brain a reason to pay attention and care. You need to know what you want out of life.

THIS IS HOW I CAN MAKE A SOFTWARE SEEM RESPONSIVE AND INTERACTIVE IN DESIGN:

In order to make good design you must acknowledge a users actions right away, telling them what is happening will calm them; it's the users perception of cause and effect.

- Animate movements clearly and smoothly.
- Let users know when the system is busy and when it isn't busy.
- Let user cancel decisions if it takes too long to load.
- Make the user aware of how long something will take.

We don't like waiting

Rule 1 >
Use progress indicators

Rule 2 >
Display important information first .Process user input by priority not order

Rule 3 >
Fake heavy weight computations when loading takes time

Week Seven
Motivation

Willpower >

Motivation

NEW THINGS DISCOVERED AND NEVER REALIZED

If something is hard to do you feel unmotivated to do it. Which is why as designers you need to make task as easy but compelling as possible.

THIS IS WHAT I LEARNED ABOUT THIS WEEK

If an article looks nice and clean you're much less likely to close the tab in your browser. If the text is well structured and website well designed the probability of finishing the article is much bigger.

Example:

When directions are written in a difficult-to-read font, it takes people longer periods of tim eto get through it. In the same way, if directions are difficult users will see the task as being difficult, time consuming and not even worth trying to complete. People to preform a certain task when it is easy to read and understand.

Like our brains, people don't like to waste their energy, so they try to make everything easier. In other words humans work on the principal of Satisficing: which means a combination of satisfaction and sufficiency.

How to make people motivated:
Adding value to tasks you must complete.
Changing tasks every once in a while.

I WANTED TO KNOW MORE ABOUT HOW PEOPLE ARE MOTIVATED, I FOUND IT:

youtube video - https://www.youtube.com/watch?v=aljb6ZXBwV0

youtube video - https://www.youtube.com/watch?v=sTw_iAhonJ4

THIS IS WHAT I FOUND:

According to sources one of the biggest ways to motivate people is by giving them goals. Competitiveness is a key element in motivating people. You see it in learning apps such as duolinguo. The way the app motivates its users is by giving them points when they do well or reach their goals. To keep users motivated they have a function called streaks, if the user continues using the app over a certain amount of days the streaks increase, if the user misses a day they can loose all their streaks. It's a rewarding system that makes the user want to compete with themselves, this in turn makes the user motivated to use the app.

Certain cues can also trigger certain mindsets. For example after someone gets a haircut they might feel brand new and start feeling better about themselves. If someone does something everyday like shaving, that cue can put you into a mindset of productiveness throughout the day.

THIS IS HOW I CAN MOTIVATE PEOPLE IN DESIGN:

- Giving the user tasks.
- Giving the user a goal.
- Giving the user awards.
- Cues such as notifications that let the user know they should start again.
- Keep the user engaged with awards that can disappear.

Keeping people motivated

Rule 1 >
People are motivated when they see something new

Rule 2 >
Make things easy to do and even easier to read. Don't use complicated language

Rule 3 >
Give users realistic goals, awards and tasks that they can complete

Bibliography

All Guidelines were taken from:

1. Johnson, J. (2014). Designing with the mind in mind. Amsterdam: Morgan Kaufmann Publishers/Elsevier.

All other references are mentioned where the information is used.