

A Design Thinking Story

On ideating an innovative learning experience on the web

(If Wikipedia was invented today, what would it look like?)

Table of Contents

I	Introduction	Context Problem Aim A brief note on Innovation Hunt Statement Hunt Statement – Revised Making Assumptions Explicit
II	Research Process	Framework Process
III	Secondary Research	Findings Current popular solutions for casual learning
IV	Primary Research	Research Methodology Observation In-depth Interview Research questions Research data Sampling Target participants
V	Research Analysis	Affinity Mapping Empathy Map 'Need Ranking' – A new way to prioritise needs Assumptions Mapping
VI	Key Insights	Minor Insights User-Centred Needs Prioritisation Results on the Initial Assumptions
VII	Design Opportunities	Principles Intent
VIII	Review of progress	
IX	Next phases	
	References	

I. Introduction

Context

The Web as the first destination for learning. A series of technological advancements has made young people reliant on the Web. The Web is the primary source of information for younger generations. The time spent online by Millennials went from a bit more than 1 hour and a half, to roughly 4 hours a day in just the last five years (Statista 2018). The rapid development of the Web has opened up new possibilities. As the Internet matures and costs go down, a shift towards visual content in some areas is taking place (Forbes, 2010; Coldewey 2018). The web has allowed new media types to spread, e.g. live videos, GIFs, infographics and an unprecedented quantity and quality of images and photos.

The way we consume content online and the type of content we consume has changed drastically in the past 15 years. Four main factors might have pushed the demand for more visual content: cheaper access to mobile data and WiFi, lower startup costs for creating online products, increased competition, and a fast-paced lifestyle which leads to wanting information fast and to the point. With the rise of YouTube, podcasts, Snapchat, and other types of media, the competition for attention has intensified. Boundaries have been pushed to create content worth of our time and headlines engineered to catch our attention.

However, this shift might not have been experienced evenly throughout the web. For instance, Wikipedia's way of conveying information has not changed since its inception. In this project, the aim is to research the current state of casual online learning and ways to innovate it.

Are there ways to make learning experiences on the web significantly more delightful?

Problem

Is text-based communication (e.g. Wikipedia) the best way to convey information? Most students agree that visual communication tools can enhance appeal, comprehension and retention (Vanichvasin 2013). However, an overview of the 5th most popular global website – Wikipedia - (Alexa 2018) shows that its articles are predominantly textual. Shepard (1967) demonstrated that pictures are better remembered than words and Moorefield-Lang (2011) illustrated how data in graphic illustrative form makes it easier for readers to absorb the content. 84% of the students stated that using visual literacy in education is more engaging than learning with textual information (Bicen and Beheshti 2017). If that is the case, why do we still rely mainly on textual content? Could there be a gap in the market for a superior solution?

Aim

A profound understanding. This research aims to deeply understand the users' process and their needs in relation to learning new topics online and to investigate whether it would be possible to make online learning experience significantly better.



WIKIPEDIA
The Free Encyclopedia

Article [Talk](#)

Nikola Tesla

From Wikipedia, the free encyclopedia

For other uses, see [Nikola Tesla \(disambiguation\)](#)

Nikola Tesla (/tɛsla/; [2] Serbian Cyrillic: Никола Тесла; pronunciation: [nikołja tɛsla]; 10 July 1856 – 7 January 1943) was a Serbian-American [3][4][5] inventor, electrical engineer, mechanical engineer, and futurist who is best known for his contributions to the design of the modern alternating current (AC) electricity supply system.

Born and raised in the Austrian Empire, Tesla studied mathematics and physics in engineering and physics in the 1870s and gained practical experience in the early 1880s working in telephony and at Continental Edison Company. He emigrated to the United States in 1884 and became a naturalized citizen. He worked for a short time for Thomas Edison's company, [Edison Machine Works](#) in New York City before he struck out on his own. With the help of partners to finance and market his ideas, he founded [Tesla Electric Light and Manufacturing Company](#) in New York to develop a range of devices. His alternating current (AC) induction motor and transformer patents, licensed by [Westinghouse Electric](#), earned him a considerable amount of money and became the basis for the AC power system which that company would eventually dominate.

Attempting to develop inventions he could patent, he conducted a range of experiments with mechanical oscillators, X-ray tubes, ball lightning, discharge tubes, and early X-ray imaging. He also built a small-scale Wardenclyffe Tower, one of the first ever exhibited. Tesla became a public figure and would demonstrate his achievements to the public.

[Main page](#)
[Contents](#)
[Featured content](#)
[Current events](#)
[Random article](#)
[Donate to Wikipedia](#)
[Wikipedia store](#)

[Interaction](#)
[Help](#)
[About Wikipedia](#)
[Community portal](#)
[Recent changes](#)
[Contact page](#)

[Tools](#)
[What links here](#)
[Related changes](#)
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A brief note on Innovation

The goal of this project was to create something very different to what is already available to users on the market. The base for innovation is **challenging the status quo** and asking questions that have been seemingly already answered. In this context, Wikipedia and a series of other online publications have been successful and appear to be good enough for most casual learners. Could there be an opportunity to improve the way content is communicated on the Web?

Successful products are built on contrarian insights. The focus throughout this research was to uncover unique findings that contradict common knowledge. Knowing what everyone else already knows, cannot result in a new, innovative product, as common knowledge is already incorporated in today's digital products. The research was therefore also a search for an edge.

What truth do you believe that very few people agree with you on?



— Pieter Thiel

Innovation comes from those who see things that others don't.

— Steve Blank



Hunt Statement

Even though the motivation for this project was based on a hypothesis

- described in the following section 'Making assumptions explicit' - the scope of the research has been initially kept broad. In the beginning, the effort was directed towards exploring the problem space widely.

The initial search was a search for the right problem to solve.

Narrowing down options early might lead to being stuck in a local maximum of the search space. Therefore, the initial phase is devoted to finding the most important challenge to tackle. The constraints of the research process are defined by the hunt statement on the top right, which served as a guide.

Hunt Statement – Revised

Following the first two observations and interviews (described in 'Primary Research'), it became apparent that there were two very distinct sets of needs: depending on whether the user is learning for pleasure or learning to meet academic needs. Therefore, the scope of the research was recalibrated very soon with an adjusted Hunt Statement, shown on the bottom right.

To research ways to make digital learning experiences more fun, effective and engaging for young people, 18–24 years old.

To research ways to make digital learning experiences more fun, effective and engaging for young people, 18–24 years old, **with a focus on learning for pleasure rather than to meet academic needs.**

Making Assumptions Explicit

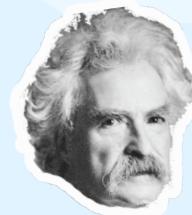
Before starting the research, hypotheses and assumptions about the problem have been made explicit. These assumptions have been listed and clearly mapped (see 'Assumption Mapping'), as to have an overall picture of the situation. The goal was to test whether any of these assumptions were valid. This way wrong assumptions would not be carried forward.

The initial set of assumptions are summarised as follows:

- Users find visual content much more engaging
- Users retain more information when it is presented visually rather than as text
- Most of the information that is today communicated with text can be conveyed visually
- There's a gap in the market for encyclopaedic visual content, as the current solutions are predominantly text-based (e.g.: Wikipedia, Biography.com)

These assumptions were mapped as illustrated in the section 'V. Research Analysis – Assumptions Mapping'.

It ain't what you don't know that gets you into trouble. It's what you know for sure that just ain't so.



— **Mark Twain**
commonly credited to

II. Research Process

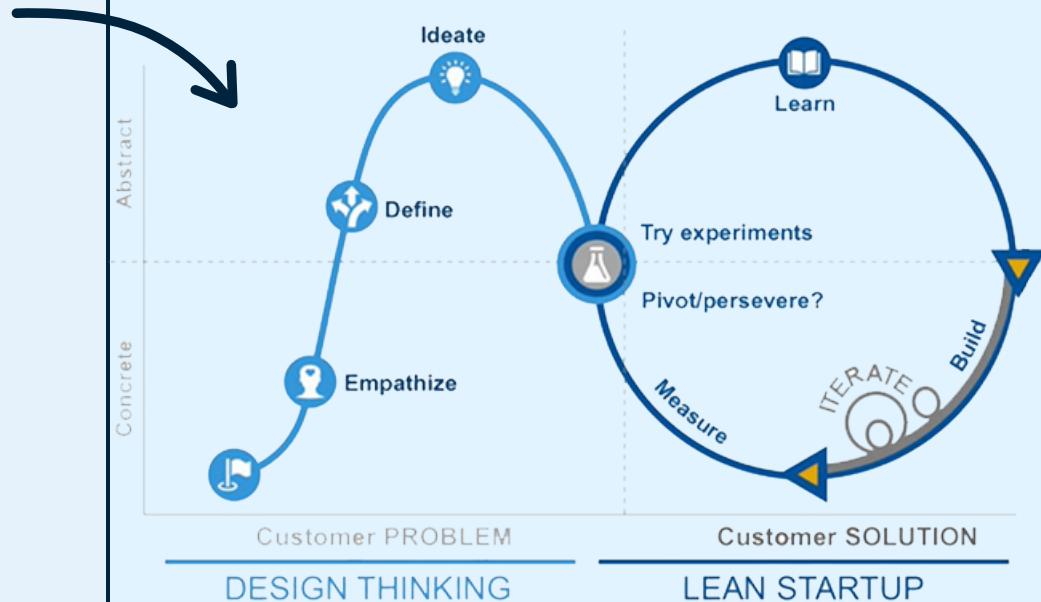
Framework

The goal of the project was to develop a **desirable, viable and feasible** product. In order to facilitate this, a research framework was adopted as a guide. For this project, the Lean UX methodology was chosen, as it better represented the iterative nature of the process than the Double Diamond – other popular methodology in User Experience Design, developed by the Design Council (2017). The first phase of the research only focuses on understanding the users' needs (desirability). Once these have been clearly defined, the feasibility and viability factors will be investigated.

Influences for the research process were drawn from multiple sources. In the past decade, the different fields of design, business, and software engineering have slowly converged towards similar methodologies of innovation. While the core concepts are derived from the Design Thinking methodology developed and popularised by IDEO (Brown 2009) and the Design Council (2017), the process used for this project has also integrated the models and ideas of 'Discovery-drive growth' (McGrath and MacMillan 2009); the Lean Startup philosophy (Ries 2011) and Customer Discovery and Development (Blank and Dorf 2012).

Process

The process at its most basic level consists of six phases: empathise, define, ideate, build, measure, learn. The last three phases build on the findings of the first three and consist of iterating through multiple Minimum Viable Products aimed at maximise learning and then repeating the process building a new experiment given the new findings, until a viable model has been reached. The focus of the first phases is to understand what users want, while the focus of the last ones is to deliver what they want.



III. Secondary Research

Findings

Secondary research was conducted both before and during the primary research phase to gather information cheaply and fast on what is already known or to compare past existing data with the one generated first-hand. A number of areas and factors that could in some way affect online learning have first been identified:

- Learning
- Memory
- Psychology
- Viral content
- Internet trends
- User behaviour on the web

After having categorised what might have an impact on learning experience, each factor was researched and investigated. Findings relevant to the scope of this project were extracted and the most relevant ones are illustrated in the table on the right-hand side with their respective references.

Learning

83.7% of the students stated that using visual literacy in education is more engaging than learning with textual information.

Bicen, H. and Beheshti, M., 2017. The Psychological Impact of Infographics in Education. BRAIN. Broad Research in Artificial Intelligence and Neuroscience, 8(4), pp.99-108.

Retrieving knowledge and skill from memory should be the primary study strategy in place of rereading.

Brown, P.C., Roediger III, H.L. and McDaniel, M.A., 2014. Make it stick. The Science of Successful Learning. Harvard University Press.

Topics need to be introduced by referencing what the learner already knows.

Text should be paired with graphics.

Frequent assessments for better retention.

Questions to recall information at the end of articles aids memorisation.

Picardo, J., 2016. A textbook problem: Seven suggestions to improve the quality of published resources.

Students learn new ideas by reference to ideas they already know.

They should think about meaning when they encounter to-be-remembered material.

The transfer of knowledge or skills to a novel problem requires both knowledge of the problem's context and a deep understanding of the problem's underlying structure.

Each subject area has some set of facts that, if committed to long-term memory, aids problem-solving. The size and content of this set varies by subject matter.

Deans for Impact, 2015. The Science of Learning. Austin, TX: Deans for Impact.

We can know more than we can tell (Tacit Knowledge).

Polanyi, M., 2009. *The tacit dimension*. University of Chicago press.

Creating an interactive experience facilitates learning.

Somers, J.A.M.E.S., 2018. *The scientific paper is obsolete*. The Atlantic.

Evidence suggests that people don't have a 'natural' learning style (visual, oral, etc.).

Khazan, O., 2018. *The Myth of 'Learning Styles'*. The Atlantic.

Curiosity, challenging assumptions, asking questions fuel learning.

Information should be encoded in the form of (emotional) stories.

The Atlantic, 2018. *What Can People Do to Get Better at Learning?*. YouTube Video.

Memory

Appeal to all the senses, establish meaningful connections, repetition, and divide the information in small digestible chunks.

Young, C., 2015. *Don't forget, the science of memory is key to helping students learn*. The Guardian.

Psychology

Flow (happiness) is experienced when perceived challenges and skills are above the actor's average levels; when they are below, apathy is experienced.

Nakamura, J. and Csikszentmihalyi, M., 2014. The concept of flow. In *Flow and the foundations of positive psychology* (pp. 239-263). Springer Netherlands.

"Our search for variable rewards is about an endless desire for three types of rewards: those of the tribe, the hunt and the self."

"We are the most relentlessly curious species on the planet, having made more sense of our surroundings than any other animal. But it is this same impulse, to search endlessly, never satisfied, that creates habitual behaviour from many new technologies."

Eyal, N. and Hoover, R., 2013. *Hooked: A Guide to Building Habit-Forming Products*

Viral content

Give your product – and its owner – social status by making it – and those who own/talk about it appear remarkable.

Associate your product with ideas and activities in people's lives.

Strive to evoke 'awe' or an emotional response.

Make adoption and use, publicly visible and copyable.

'News you can use'. Information should be useful and have practical value.

Your product should be wrapped up/communicated in a shareable (human) story or narrative.

Berger, J., 2016. *Contagious: Why things catch on*. Simon and Schuster.

Formula to make information spread: SUCCESs (Simple. Unexpected, Concrete, Credible, Emotional, Story).

Heath, C. and Heath, D., 2007. *Made to stick: Why some ideas survive and others die*. Random House.

Internet Trends

93% believe videos increase satisfaction of students with their learning experience.

85% believe it increases student achievements.

Kaltura, 2017. The State of Video in Education 2017.

Teens have largely ditched Facebook for the visually stimulating alternatives like Snapchat, Instagram, YouTube.

Coldewey, D., 2018. Teens dump Facebook for YouTube, Instagram and Snapchat. TechCrunch.

Growth in demand for GIFs in place of images, quotes and a slight increase in infographics.

Google Trends.

Video is becoming a critical information source for everyone, CEOs included.

Forbes, 2010. Executives embrace the Non-Text Web. Forbes Insights.

Online newspapers and magazines are moving towards subscription-based business models.

Crichton, D., 2018. Subscription Hell. TechCrunch.

User behaviour on the web

Concise, scannable, and objective text performed best. Bullet-points, headings, and summarised information.

Nielsen, J., 1997. How users read on the web. Nielsen Norman Group.

Time spent online by Millennials, more than doubled in the past five years. From 1.7h to 3.7h per day.

Statista, 2018. Daily time spent on mobile by Millennial internet users worldwide from 2012 to 2017. Statista.

Table 1 – Secondary research findings

Current popular solutions for casual learning

Furthermore, a quick analysis of the ways in which the problem of learning online is solved in the market today was conducted. Shown by the table on the right-hand side.

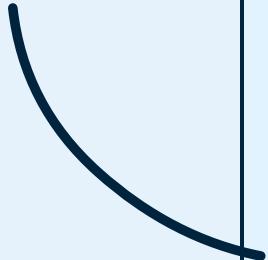
- 
- | | |
|---|--|
| W | Wikipedia
Text-based learning. Crowdsourced information. |
| Y | YouTube
Video-based learning. Often low reliability. |
| G | Google Images
Image-based research. |
| P | Pinterest
Image-based inspiration with social aspects (e.g. sharing). |
| Q | Quora
Question-and-Answers format, often answered by subject matter experts |
| R | Reddit
Community that surfaces the best content via 'upvotes'. Crowdsourced. |
| A | Axios
Bite-sized news. |
| I | Infographics (generic)
Visual illustrations of key fact and key numbers, often with little depth and little description of the meaning of these figures. |
| B | Blogs and Articles (generic)
Text-based, often opinionated pieces of information. |

Table 2 – Current popular solutions

IV. Primary Research

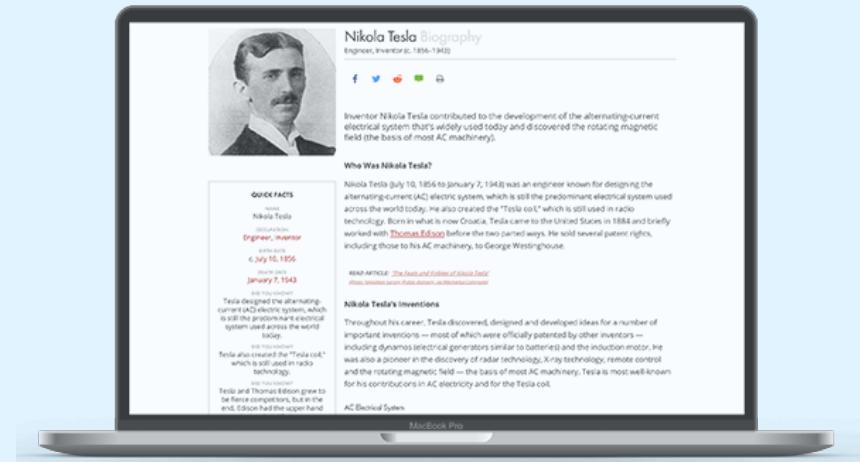
Research Methodology

The research process has adopted user-centred design principles. A combination of methods has been implemented allowing to uncover what users do, say and feel. The main challenge with studying the process of learning is that it cannot be directly observed as it happens in the user's mind. As a consequence the research relied on proxies to identify it: e.g. what the users remember; how the users feel about the experience; how they interact with the content; their non-verbal communication. To tackle these challenges the following research methods have been chosen.

Observation

Each participant was first given a scenario and asked to complete a task. The scenario is shown in the following section 'Research questions' and involved surfing the web to reach a specific goal. During the process, participants were encouraged to express their thoughts, feelings and considerations of their perception. Participants were prompted to think aloud. Four of the participants were observed in their natural environment, their own flat/bedroom; while the remaining two in a neutral, public space. The observations were semi-structured and flexible to unexpected user's actions. The questions adapted to the particular path taken by each participant. The computer screen was recorded for the duration of the task and notes were taken by the investigator. The user's voice was also recorded.

Aim. Observations were chosen because they allow to witness factual behaviours of target users, what they actually do rather than what they say they do. Observing allowed to form an overall picture of **WHAT** users do. But to understand the **WHY**: their motivations and their opinions, interviews were needed. After each observation, a long interview was conducted with each of the participants.



In-Depth Interview

To better understand how the participants experienced the process of online learning, in-depth interviews were conducted. The first half of the interview was related to the task they had been given and was related to that particular learning experience. The second half of the interview went beyond the observation and questions related to all aspects of learning something new on the web.

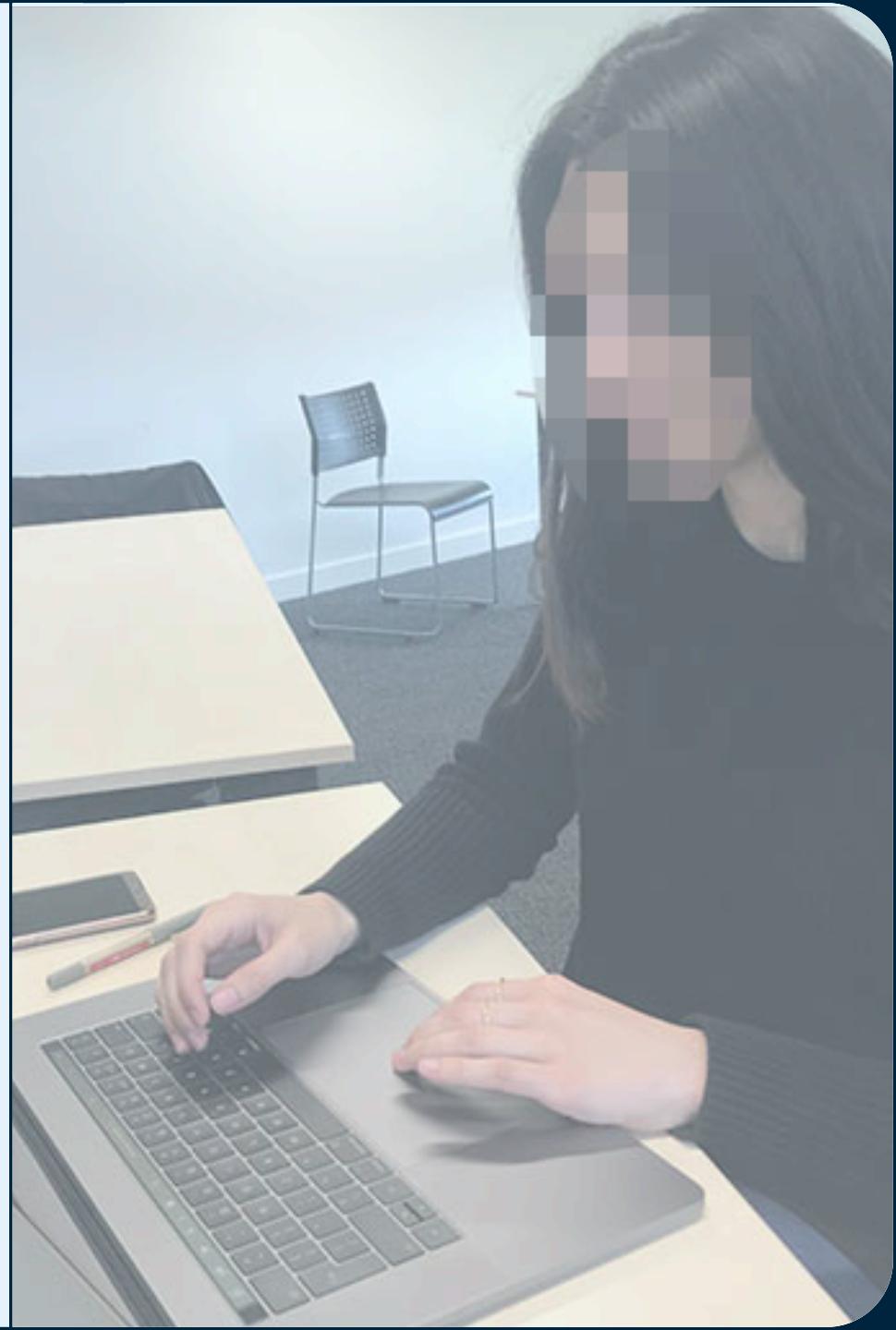
Aim. The goal was to understand their reasoning behind their actions and express their general thoughts on different strategies for learning. The combination of these two methods – observations and in-depth interviews – resulted in a good understanding of how users approach learning online to how they feel at each particular stage of the process.

Research questions

The overarching goal was to discover whether online learning experiences could be significantly improved. To help answer this questions and related ones, a series of themes were defined that formed the starting point for the questions participants were asked:

- How do students approach the problem of learning something new online (e.g. the biography of a scientist)?
- What are, today, the main challenges of readers when they seek new information online?
- Is there room for significant improvements to the current state and the possibility of creating a superior digital product?

From this, more specific questions have been developed to ask participants. A list of the questions asked can be found below:



General questions

- What are your priorities when learning something new online?
- What would your ideal experience look like? Think 100 years in the future.
- What type of content do you prefer when learning? Why?
- What do you value the most when learning new things online?
- What makes learning fun to you?
- In your opinion, what's the worst part of trying to learn something online?
- Do you have a favourite website to learn new things from? Which one? Why?
- And what do you not like about it?
- In general, do you find it hard to learn new things online? Why/ Why not?
- What do you like and not like about learning by:
 - Watching a video
 - Reading an article
 - Seeing an infographic
 - Looking at images
 - Looking at graphs/diagrams/charts
 - Listening to a podcast

Table 3 – Research questions (In-Depth Interview)

Scenario

You read somewhere that a scientist called [Nikola Tesla] did amazing things. You are curious about who he was and have some spare time to learn about him.

A laptop is presented to the participant.

Related questions

- What was your favourite part of the experience? Why?
- What was the most confusing one? Why?
- And the most boring? Why?
- What do you remember of what you just read?
- What's the most useful thing you learned about X?
- And the most surprising?
- How did you feel in the different stages of the experience?

Table 4 – Research questions (Observation)

Research data

The raw data recorded consisted of:

- Audio recordings of the interviews
- Screen capture (video) of the laptop screen during the process of learning about a topic on the web (including mouse position and behaviour)

This data was later used to extract information on factors such as:

- User's expressed preferences
- User's expressed emotions throughout the process
- Websites the participant interacted with during the session
- How long a participant interacted with each website (duration and bounce rate)
- The path taken by each user in the process of learning something new online

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Sampling

The selection of participants followed a Convenience Sampling methodology, which is the selection of potential target users who are easily accessible. Acquaintances were recruited based on availability and proximity and the age criteria defined as target. The participants who took part in the research are national and international University students. Participants from four different continents were recruited to minimise the bias that a particular culture might have on the overall study.

Target Participants

Participants for this project were selected on the basis of the target user's characteristics (defined in the Hunt Statement) and the sampling methodology described above. They are University students between the age of 18 and 26. University students have been preferred to non-students as they have more experience with the problem of learning new things online, both for pleasure and for academic purposes. Generalities and research methods they took part in are indicated on the right-hand side.

ID	Gender	Age	Nationality	Observation	Interview	Need Ranking
1	Female	23	German	✓	✓	✓
2	Female	25	Lebanese	✓	✓	
3	Male	26	Brazilian	✓	✓	✓
4	Female	25	Chinese	✓	✓	
5	Male	24	English	✓	✓	
6	Male	25	Italian	✓	✓	✓

Table 5 – List of participants, generalities and research methods they took part in

V. Research Analysis

Affinity Mapping

Affinity Mapping was the method chosen to make sense of the data collected throughout the research. Affinity Mapping is described as the “process used to externalise and meaningfully cluster observations and insights from research, keeping teams grounded in data as they design” (Martin and Hanington, 2012).

The mapping process was completed in three phases. Initially, the main insights were written on sticky notes and posted to the wall in an unordered sequence. After that, they were grouped by similarities. Finally, the groups were further clustered by overarching themes. In this way, patterns could be detected and analysed as the overall picture started to form. Another advantage of affinity mapping was noting how often a particular observation or comment by a user had been made. Results are illustrated in the next chapter ('Key Findings').

P1	Don't read articles, just quickly scan them	Expresses preference for bullet points rather than paragraphs of text	Only reads headings & sub-headings of an article. Often	Enjoys learning about the meaningful but "unimportant" stuff (fun/mem)	When seen determine what user wants to know what kind of content items need to stand out due to personalized relevance score
P1	Says there's too much irrelevant information in most articles	Finds notes to be slow. Says she learns faster when reading as they can skim and skip understanding part	Thinks Wikipedia articles are too detailed because the source (what's worth reading)	Finds hard to choose the source (what's worth reading)	Reads heading before deciding to read specific section of the respective paragraph (google search)
P2	Likes "Quick Facts"	Likes when the article gives the most important information first ("Here's what you need to know. Skip to the point")	Likes the question-and-answer format for an article	Thinks Wikipedia is "too bulky, hard to read, poorly structured"	Looks for "digests" of value - e.g. news of a video - to decide what content to consume
P2	Wants the entire website to be divided into sections clearly	Annoyed Wikipedia because of irrelevancy	Only uses Wikipedia as a source of references	Look and feel is a key to assess trustworthiness of a website	Not interested in biographical details
P3	Thinks Wikipedia is mostly reliable	User cross-checks information	"Sect" - information affects user attention ("Editorial hidden for 118 years")	Cross-reality (things you may not know)	Looks for and is interested in fun facts
P4	Bold, italic, highlighted text catches attention and used to scan fast	Once the user has found a page valuable, he's hooked and will dive by line	Relies on seeing information that he can connect to his existing base of knowledge (bridge gap/know/learn)	Cross-checks information by visiting multiple websites	Stops his research when most of the info has already been encountered before
P5	Infographics too dry, wants some explanation of the numbers	Infographics not reliable or preferred	Images when the subject is better understood by seeing it	Users' interest for researching a topic	84% of students say that learning with visuals is more engaging than learning with textual information
P6	Variable research creates curiosity and addiction	STEPPS: Social summary, Trigger, Outcome, CSE, Desired Value, Stories	SUCCESS: Simple, Unperceived, Concrete, Credible, Emotional, Story	Curious, variable see significant self-performed test (bullet points, reading, watching, summarizing information)	Reading it is experienced when perceived goals and challenges are clear for longer periods among pupils
P7	Small diagrams	514	515	516	513



Empathy Map

Drawing on the data and information extracted from the contextual inquiries (observation and interviews), an empathy map was developed to facilitate the process of designing a final solution and keeping the user at the centre of it. The aim was to have a quick tool to refer back to when the decision to take is not clear. The map would allow to empathise with the users and to keep their needs at the core of any type of activities done in the context of this project. An empathy map is defined as “collaborative visualization used to articulate what we know about a particular type of user. It externalizes knowledge about users in order to 1) create a shared understanding of user needs, and 2) aid in decision making” (Gibbons 2018).

As it is illustrated on the right, the map was divided in four sections: ‘says’, ‘thinks’, ‘does’, ‘feels’. For each of them, sticky notes were used to capture the key findings from the primary research and added to the respective section. The goal was to have a visual tool to use as guide to make meaningful decision.

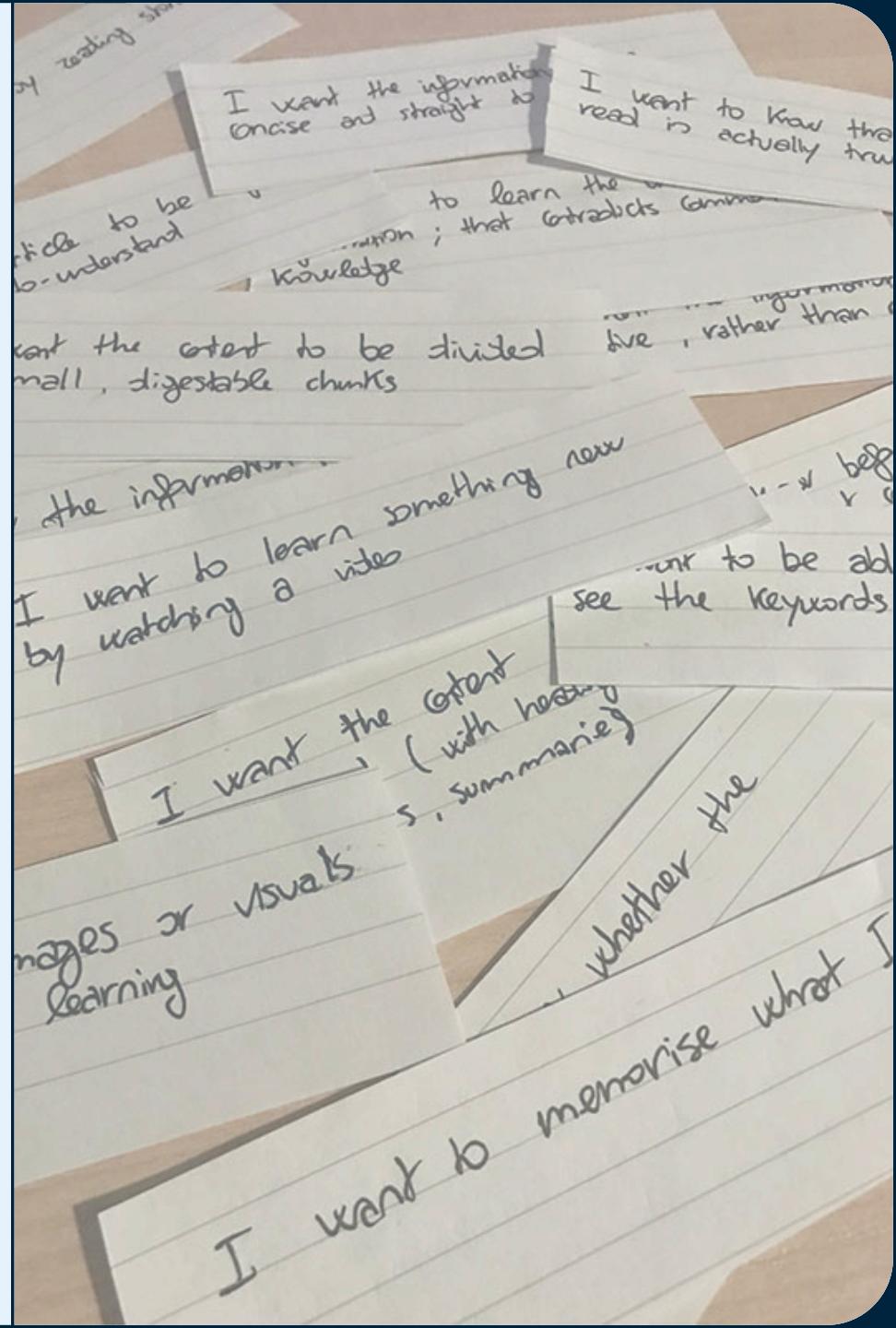


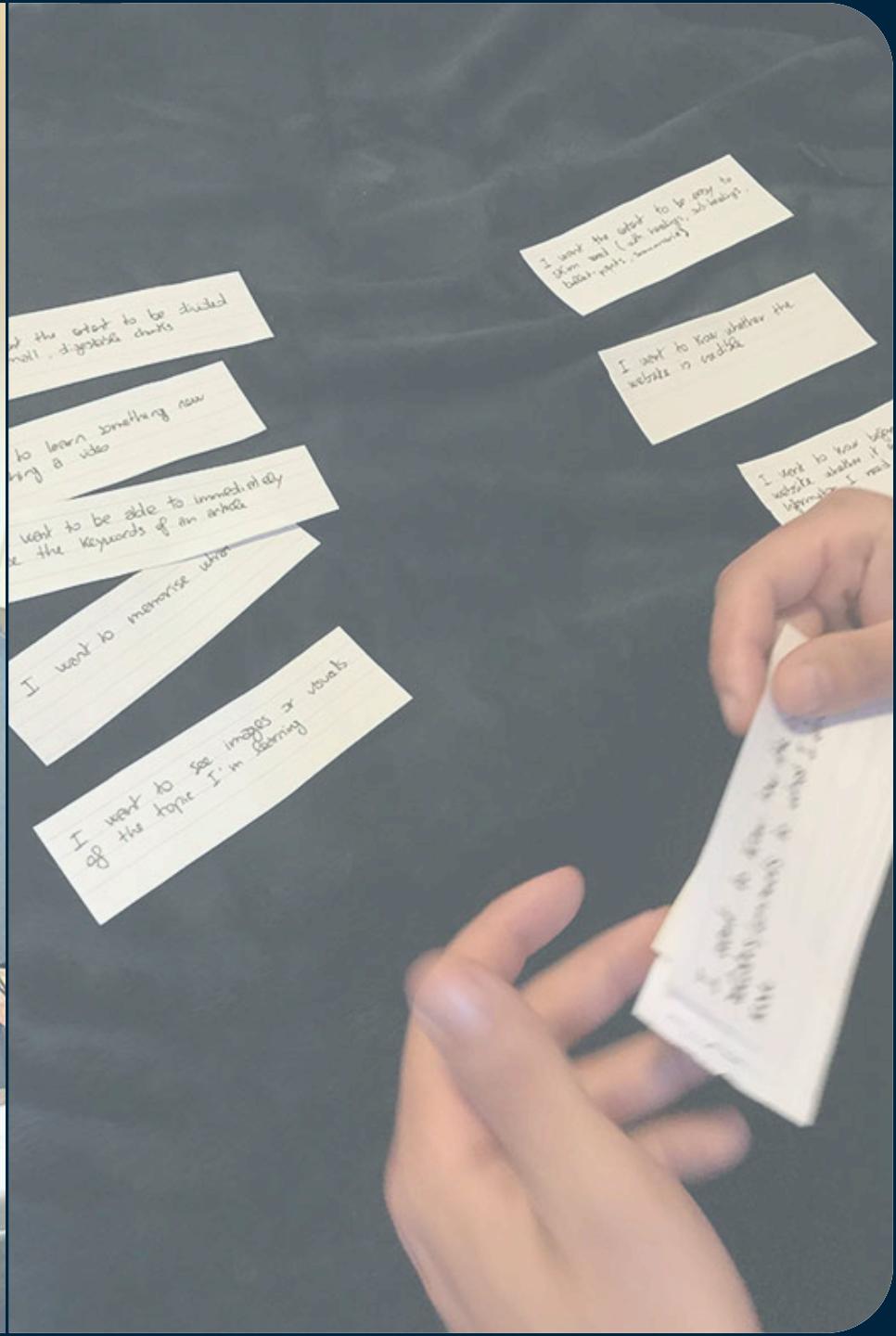
'Need ranking' – A new way to prioritise needs

A creative method to prioritise the right problems to solve was implemented, allowing target users to determine what they 'need the most'. The investigator recognised that not all users' needs are equal. Some are more important than others. To make sure that the focus of the project was on the most important problem, three target users were asked to rank each need from the most important to the least. In most UXD projects, findings are all treated equally. This is not ideal since some pain points are more acute than others. The focus should be on the bigger challenges users currently have. However, it is hard to estimate which needs are more prominent, therefore a research method that put the user at the centre of this process was needed.

Taking as inspiration the 'Card Sorting' design research method used to refine the information architecture of a digital product, the investigator ideated a new way to prioritise users' needs by asking three of the original research participants to rank a set of needs/problems they have with online learning from most important to least important. This set of needs were previously uncovered with observations and interviews. The first step was to convert each insight (e.g.: "Users cross-check information to verify if what they just read is true, by visiting multiple websites") into a need statement from the perspective of the user (e.g.: "I want to know whether what I read is actually true"), translating them from a third-person observation into a first-person statement to help participants relate to these statements and facilitate their work.

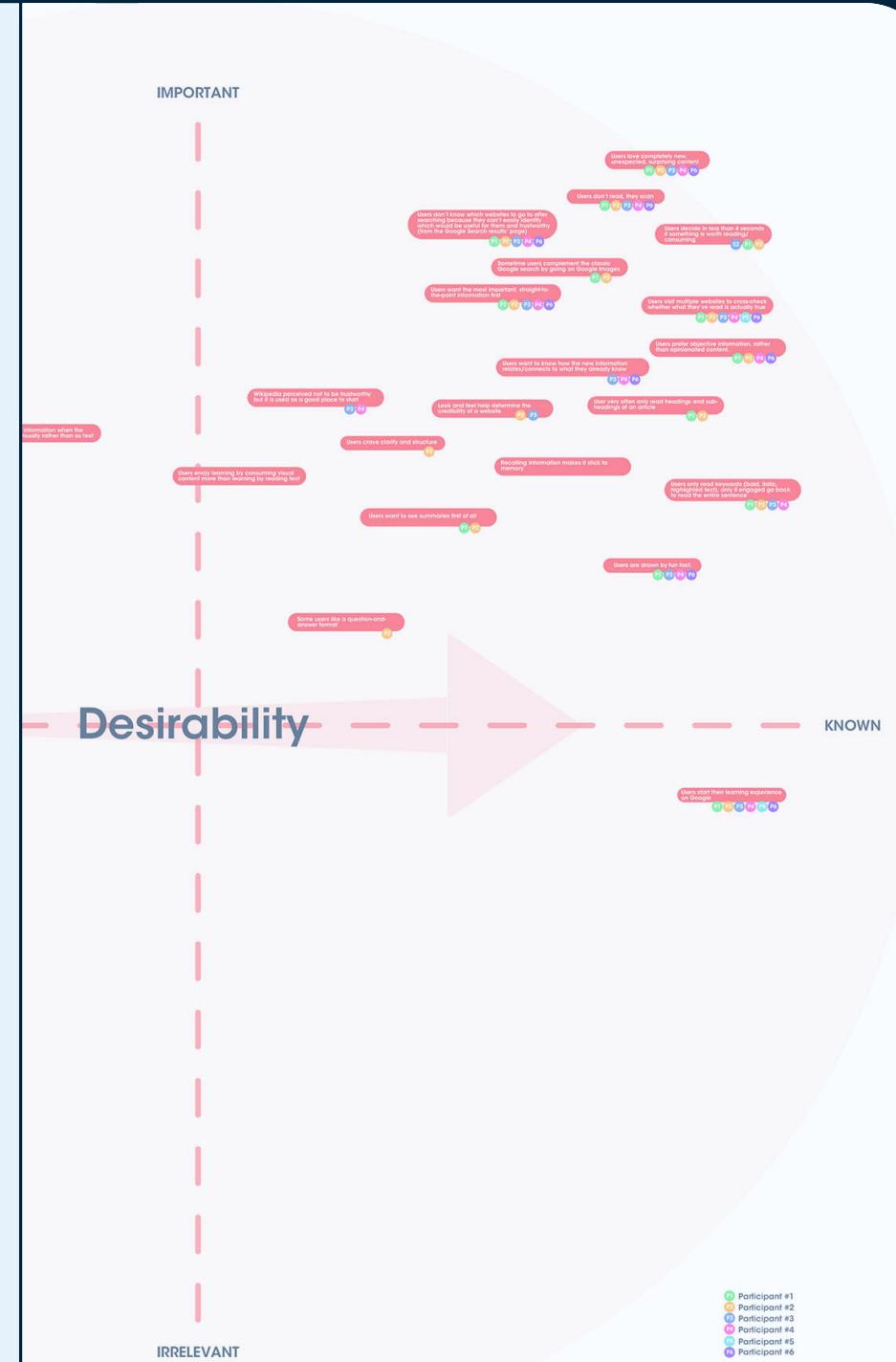
The process. The original set of insights was converted into problem statements. These problem statements were transcribed each on a small card and presented to the users. The users were asked to select the six problems that they felt were most important to them (discarding the rest) and to order them from most important to least important. The investigator has then assigned a numeric value to each problem statement selected by a user from 6, the problem rated highest by the participant – to 1, the least important one as rated by the participant. Finally, the results were added up, giving an overall picture of what pain points the users felt were the most significant. These results are presented in the following chapter.





Assumptions Mapping

To discover weaknesses during the research process and visualise what it is yet unknown to the researcher, Assumptions Mapping was implemented. The map has two axes: Important/Irrelevant and Unknown/Known. Assumptions Mapping aids in the selection of the research methods and helps to focus on what is important to discover/validate. "While teams are embracing experimentation, it is important that your teams don't waste all of their time running experiments on unimportant + known aspects of your product. Assumptions Mapping is a Lean UX exercise that gives you the power to facilitate a conversation with your team and enable them to focus on what matters." (Bland 2016) The Map, as of today, is illustrated on the right-hand side and is subject to changes as new questions arise and new learning is produced.



VI. Key Insights

The research findings are listed below. Some of them are counterintuitive and go against common knowledge; while others just confirm what is commonly assumed about user's behaviour on the web. The insights are grouped by themes as described in the previous chapter ('V. Research Analysis – Affinity Mapping').

Behaviour
Search for the right content
Credibility

- 1. Users don't read, they just scan the content (headings, sub-headings, bullet-points)
 - 2. Users only read keywords (bold, italic, highlighted text), only if engaged go back to read the entire sentence
 - 3. Users decide whether something is worth reading/consuming in a couple of seconds
-
- 1. Users sometimes complement the research by looking for visuals on Google Images or Pinterest
 - 2. After searching for a topic, users find it frustrating not knowing in advance which websites would be useful to them
-
- 1. Users cross-check information to verify if what they just read is true, by visiting multiple websites
 - 2. Users prefer objective information, rather than opinionated content
 - 3. Look and feel help determine the credibility of a website
 - 4. Wikipedia is perceived not to be trustworthy but it is considered a good place to start

- | Content | Effective learning | Visual content |
|---|--|---|
| <ul style="list-style-type: none">1. Users crave unusual, unexpected information; information that contradicts common knowledge: "something that's not mainstream", "something that shocks"2. Users believe that there is too much detail and unnecessary information on most pages3. Users love to learn the fun facts: the memorable but 'unimportant' information4. Users want to know how the new information relates/connects to what they already know5. Users want concise content, in small, digestible chunks6. Users dislike academic writing styles and want easy-to-read, informal content7. Information should be embedded in stories to make it more engaging | <ul style="list-style-type: none">1. To memorise information, users need to try to recall it | <ul style="list-style-type: none">1. Infographics are perceived not to be reliable and users do not like that the figures on them are never explained2. Videos are not optimal, because it is hard to find where exactly the specific information is located; video content is not searchable3. Users feel that videos slow down their learning4. Users think information is better remembered when presented in a video |

Table 6 - List of findings by theme

Minor insights

- Once a user has found a page worthy of his/her time, he/she reads word by word
- Users stop their learning process when most of the information has been already encountered before
- A state of flow (happiness) is experienced when perceived skills and challenges are just above the user's average levels
- Interactive experiences facilitate learning
- Users love quotes
- Content should appeal to all senses

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User-Centred Needs Prioritisation

On the right, the table summarises the results obtained with the user-centred research method adopted to evaluate which problems are the most important for the target user (as described in 'Need Ranking – A new way to prioritise needs').

I want to know whether what I read is actually true	13
I want to learn the unusual, unexpected information. Information that contradicts common knowledge: "something that shocks"	11
I want the content to be easy to skim read (headings, sub-headings, bullet-points, summaries)	11
I want the information to be concise and straight to the point	10
I want the information to be objective, rather than opinionated	7
I want to memorise what I read	4
I want to see images or visuals of the topic I'm learning	4
I'm curious to know the fun facts: the memorable but 'unimportant' stuff	2
I want to know before clicking on a website whether it contains the information I need	1
I want the article to be informal and very easy-to-understand	1

Higher score = More important to user

Table 7 – User's needs, prioritised by the users themselves

Results on the Initial Assumptions

Were the original assumptions valid? In 'Chapter I – Making Assumptions Explicit', a series of hypotheses were put forth. The root hypothesis stated that adding visual content to text-based pages would improve online learning and allow for a better retention of the information. After having conducted the research, the validity of such statements can be ascertained. It was found that while visuals would, to some extent, be an improvement over the current state, there are other problems that users believe to be more important as is evident in the Needs Prioritisation table above.

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VII. Design Direction

The research undertaken has shown that what users want does not currently match the way even popular websites are designed. One of the major insights is that users' default online behaviour consists in scanning pages quickly; however, today websites are mainly designed to be read. Users have shown a marked preference for small chunks of information presented in many short paragraphs, with headings, subheadings, bullet-points and highlighted keywords. Today's popular websites are built on the assumption that users read word by word, the way they would read a book; in reality, based on research, users skim the content and just focus on a very small portion once they recognise keywords that are relevant to them. Another significant finding was that users are more interested in unusual, unexpected, unconventional information, information that contradicts common knowledge. However, the common belief is that users want to learn the most important mainstream ideas for any given topic. Users also lament how much unnecessary information is currently presented to them.

One more unexpected finding that emerged constantly throughout the research was the fact that users struggle to figure out how valuable or useful a web page is from the search engine's result page. However, this would be outside of the scope for this project.

Live in the future, then build what's missing.



— Paul Graham

Principles

These principles – that are contrarian to the common assumptions underlying today's websites – will form the basis for the concept generation.

- **Scannable.** Everything should be designed to allow the user to skim read the content and find the information he's looking for as fast as possible. Summaries, 'Quick Facts', and bullet-points help
- **Memorable impression.** The first three seconds of the experience are the most important
- **Objective.** No opinionated content, information should be neutral and objective and should let the user form his/her own opinions
- **Contrarian.** Focus on ideas that are not commonly expressed in the mainstream, sound counteractive or are unexpected and unconventional

Intent

The final concept will focus on a very niche topic that is yet to be defined and that can be supported by all the findings in order to develop an advantage in the market over competing products. Identifying and selecting a suitable niche will be one of the priorities of the next phase of the project.

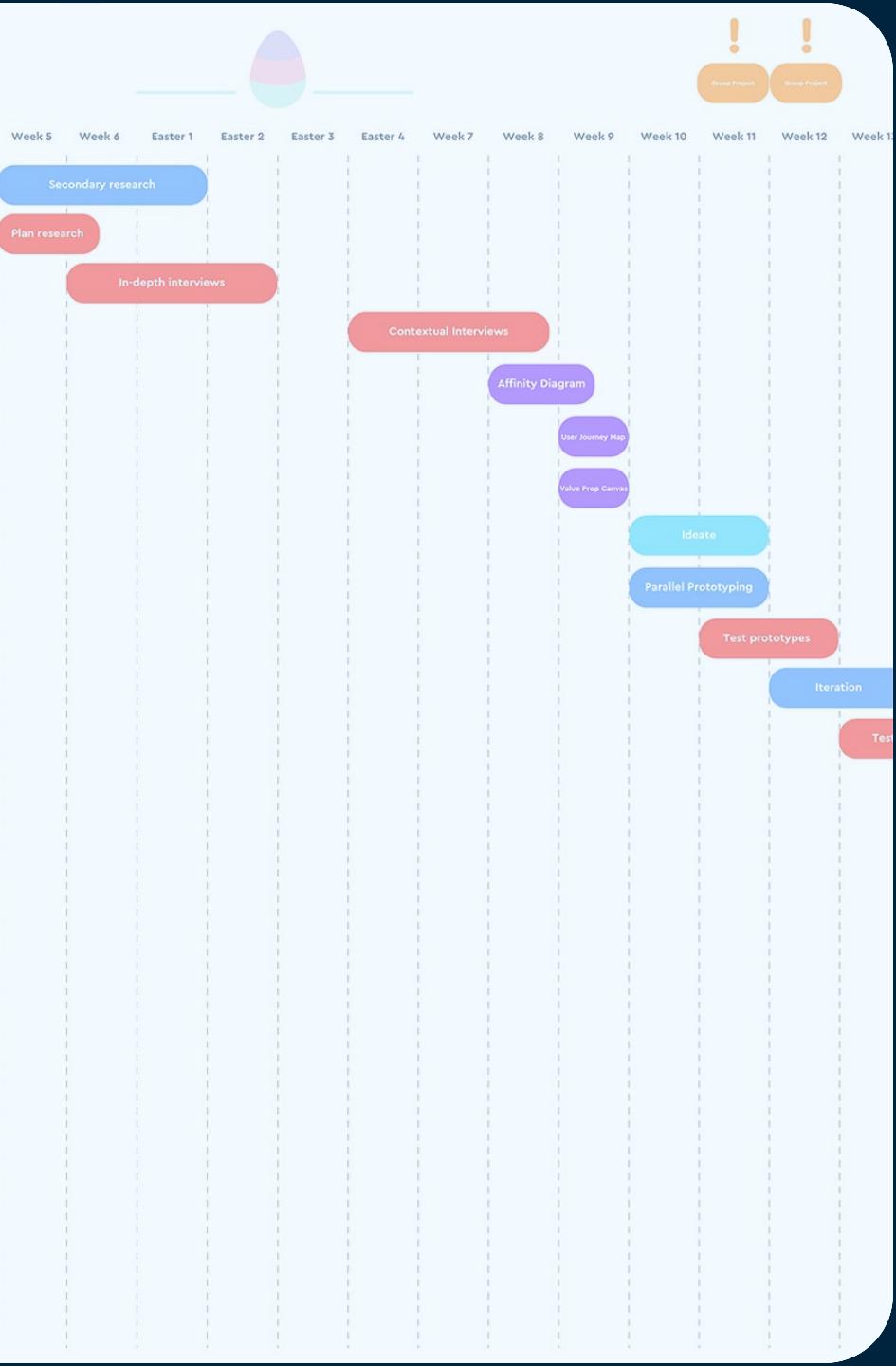
Every great business is built around a secret that's hidden from the outside. A great company is a conspiracy to change the world.

— Peter Thiel



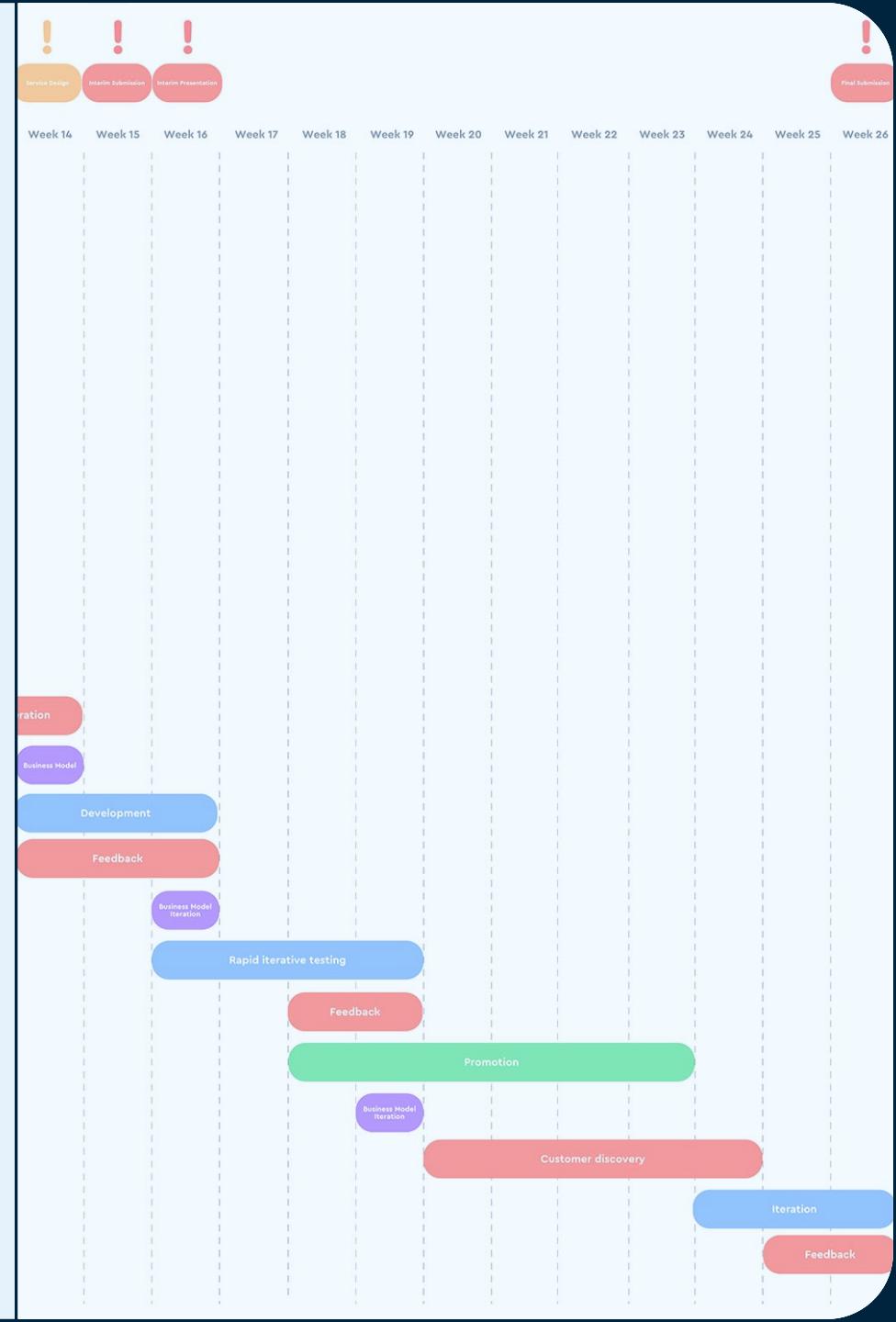
VIII. Review of Progress

In this first phase, the process of (casual) online learning has been studied in depth. One of the original hypotheses that inspired the research was the opportunity to make online learning experiences significantly more visual and interactive. Firstly, the entire set of initial assumptions and hypotheses were mapped on an Assumptions Map to keep track of knowns and unknowns and guide the research. After that, an analysis of past literature on areas relevant to the scope of this project was conducted. Subsequently, potential target users have been involved. The primary research consisted in observing how users behave online today - given the current constraints and services - in the context of online learning for pleasure, and by asking them how they perceive the experience. Users' attitudes and opinions have also been collected. Next, those findings have been closely analysed by clustering observations and initial preferences into an Affinity Map, which produced a series of insights. Finally, to determine the importance of each insight, a new research method has been devised and implemented to let users rank the needs/problems that were most relevant to them. The next phase will entail further narrowing down the scope of the project and developing concepts to satisfy those identified needs.



IX. Next phase

Moving forward. Now that a good understanding of the user's desirability has been determined, the next phases of the project consist in researching the remaining two variables of the project: feasibility and viability. The focus will be on ideating feasible digital products and testing them with a focus on maximising learning and expecting to go through multiple iterations. Fast prototyping will help define the final concept by gathering further feedback from potential target users while 'de-risking' the project. A better understanding of the current landscape will be developed to take the best ideas in the market today and recombine them in a new product that users want.



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A portrait photograph of Carmine Di Martino, a young man with dark hair and a full beard, smiling at the camera. He is wearing a dark zip-up hoodie.

Carmine Di Martino

Carmine Di Martino

A Design Thinking Story

To be continued

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