# Data Driven Design Group Assignment

## Summary of d.school process implementation

# Ethics in the field of novel online services

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## Introduction

The internet is like a digital fabric woven into the life of every person in one way or another. It has evolved into one of the most effective means of communication where possibilities to create, gather and share information are continually being established. By virtue of this ease of communication, the consequences on our daily lives are often overlooked. Large corporates have found ways to benefit from internet users, particularly in the form of user data. Data is inherently linked to the internet and omnipresent for those knowing how to find it. Even though this by itself does not pose any immediate threats, it is accompanied by an abundance of caveats. One of the greatest concerns is the discrepancy between what users know is taken from them and what is actually taken from them. As can be seen in the Dutch legal system, the provider of services has an obligation to notify and the receiver of services has an obligation to investigate. While it is debatable which obligation prevails, this debate becomes futile in the context of the internet due to its particular characteristics. As of today, there are no clear-cut laws, rules or guidelines to which online services must adhere. Even though more laws are gradually coming into existence, they are almost always far behind technology instead of the other way around (Schultz, 2005). Anticipating instead of responding should be common practice to keep users safe from new emerging technologies. Moreover, terms and conditions composed by online corporates are virtually unreadable and their online algorithms are onerous to dissect in order to trace what data is being taken for what purpose. Furthermore, users cannot or do not fulfill their responsibility of informing and educating themselves about the consequences of using online services. The sum of all these partial problems combines into a complex problem difficult to solve, called a wicked problem. The present wicked problem is thus as follows: How can we ensure adequate ethical guidelines in the landscape of novel online services?

In this paper, a potential solution to the issue has been designed and proposed through the use and application of the Stanford d.school methodology. By following this methodology the team was able to continually expand the realm of potential solutions in a cyclic manner. The document further explains what a wicked problem is, why the described situation is a wicked problem and why it is worth solving. The second part of the document provides a review of each of the different application cycles. Finally, the discussion section highlights the benefits and limitations of the product prototype developed and provide an evaluation of the challenges and advantages of the actual process followed.

## Wicked problems

Wicked problems were first described by Rittel and Webber (1973), who were analyzing the difficulty of social policies and urban planning. They noticed that there are often no optimal solutions to these kinds of problems, since overall equity is non-existent (Rittel & Webber, 1973). In essence, what is good for one

part of the public is not good for other parts of the public. Problematically, wicked problems do not have a solution at all, for there are no definitive and objective answers. So, what defines wicked problems?

Ten properties of a problem were defined to help identify wicked problems such as having incomplete or contradictory knowledge about the problem or having many different stakeholders involved, all with their own values, priorities and goals. As summarized by Camillus in 2008, wicked problems are inherently difficult to solve because they are innumerable, difficult to describe and do not have a clear-cut answer. In order to find an answer to the team's wicked problem, similar problems will be discussed and analyzed. Moreover, taking the different properties of wicked problems a focal point, the wicked problem identified will be further explored.

The problem of ethics in emerging technologies is not novel. Moor (2005) explains that it is especially relevant in this field, because technological developments allow individuals to act in new ways for which rules, guidelines or ethics are often not yet constituted. Depoorter (2008) explains that in the realm of copyright law, the fact that laws follow emerging technological trends is problematic because it leaves room for individuals trying to squander with copyright enforcement. What Depoorter (2009) calls legal delay is unsettling in the field of copyright law, but becomes dangerous when occurring in other fields of emerging technologies. Take the use of nanotechnology for military purposes for example. Altmann and Gubrud (2004) stress that the emergence of this kind of technology is insurmountable, so best practice in the form of anticipation with well-defined guidelines before they become relevant should be the ultimate goal. Their solution is then to focus on strengthening the international society, creating respect for international institutions and laws and ensuring large scale alliances. This is a reasonable view with respect to emerging military technologies because these ethics are relatively clear-cut. However, taking the sphere of autonomous vehicles, ethics are less definite. The choices that autonomous vehicles have to take in fatal dilemmas are based on ethics provided by programmers (Gerdes & Thornton, 2015). Determining what such ethics are is dependent on the culture in which the vehicle will operate and the legal interpretation of the made choices (Gerdes & Thornton, 2015). Gerdes and Thornton explain that rules chosen to govern the autonomous vehicle are thus a trade-off between weighting consequences and deontological ethics (i.e. relating to morality of actions). Coming up with ubiquitous ethical guidelines then de facto becomes unattainable, because different people have different opinions and viewpoints about ethical rules.

Coming back to the subject of the team's wicked problem, these ethical constraints become even more convoluted. New online services come into existence every day, on which millions of photos and locations are shared. Disputably, the apps and online services on which this happens do not protect the user's profile

from third parties that can download this and similar information (Fire, Goldschmidt & Elovici, 2014). On the one hand this provides an opportunity for third parties to do analyses based on this data so that personalized marketing can be used, which is arguably beneficial. On the other hand this also allows third parties to create biometric databases which can be sold to other parties, often without explicit user consent (Fire, Goldschmidt & Elovici, 2014). These practices, objectively less beneficial to users, have occurred oftentimes in varying modalities and have caught the attention of governments in the form of interventions. For example, TikTok was banned in December 2019 by the US army on the guidelines by the Pentagon because the service was violating data privacy laws (Anderson, 2020). They were also under scrutiny with regards to a violation of the Children's Online Privacy Protection Act (COPA) and General Data Protection Regulation (GDPR) by using user data inappropriately (Anderson, 2020). Moreover, ByteDance, TikTok's parent company, has developed face-swapping technology on the basis of user data (Anderson, 2020). This can have far reaching consequences if used by the wrong people. The core issue with these emerging technologies is the problem of uncertainty (Brey, 2012a). Like Brey (2012a) explains, it is virtually impossible to come up with ethics for new technologies without proper methodologies for forecasting and anticipation. Coming up with guidelines after the product or service has already launched, as was the case with the TikTok example above, will lead to both users' privacy being violated and companies having to pay for those violations. Brey (2012a) proposes a workflow, in which governments and independent parties like the present team should be working together to try and forecast new technologies, perform ethical analyses, evaluate unveiled ethical issues and offer policy suggestions. However, as is also highlighted by Lucivero, Swierstra and Boenink (2011), this kind of upstream technological assessment per definition works with predictions and cannot be completely tailored to the emerging technology. Moreover, Brey (2012b) explains that users remain mostly unconsidered in this kind of approach. Even though top-down processes seem to be the most effective and prevalent for coming up with ethical guidelines for emerging technologies (Lucivero, Swierstra & Boenink, 2011), not taking the users into account is unreasonable because ethical issues emerge from different users having a different relationship with the technology, based on context, culture and individual preferences (Brey, 2012b).

Summarizing, emerging technologies are omnipresent and highly vulnerable to bad intentions. Today this is especially relevant because new technologies are acting as an impetus for even newer technologies, perpetually affecting more and more individuals. Ethical guidelines and laws are often succeeding technologies instead of the other way around, resulting in users being mistreated and companies being punished. Approaches based on forecast and anticipation have been proposed and applied, but often times they do not take different users and their ways into account. All this together makes this a difficult yet lucrative problem. From this point on, the team will explain their approach to this wicked problem, the

process adopted to come to a solution, a proposed prototype used to solve the issue and a discussion analysing the process and suggested prototype.

## Data-Driven approach that leverages the emotion of Fear

Although there is not a clear definition of *fear appeal*, it can be described as a strategy that highlights the risks of using or not using a product, a service or an idea (Williams, 2011). More in details, the core principle of *fear appeal* according to Williams is that "fear appeals rely on a threat to an individual's well-being which motivates him or her toward action". This strategy is often used in marketing communication, to make the audience feel more involved with the message (Williams, 2011).

This project will make use of this principle to create a video and other Marketing tools to install a sense of fear in people about companies' use of customer or user data. In addition to that, in order to increase the fear effect, the video is based on personal data, which makes this strategy "data-driven". Examples of personalized videos can be found on Facebook: birthday videos, friendship anniversary videos and other videos celebrating important events. There are many benefits that derive from basing a communication strategy on personal data, e.g. higher response rates, more loyalty and higher persuasive impact (Strycharz, J., van Noort, G., Helberger, N. and Smit, E., 2019).

Moreover, as reported by the Pew Research Centre in 2018: "people are anxious about all the personal information that is collected and shared and the security of their data" and again, "91% of Americans "agree" or "strongly agree" that people have lost control over how personal information is collected and used by all kinds of entities". Clearly, these findings support the idea that people do not trust how companies treat their data. Being aware of this reality and of the benefits that a personalized fear appeal strategy can bring, the team believes that the combination of these factors and principles can create a winning strategy to reach and engage the highest number of people to use our product.
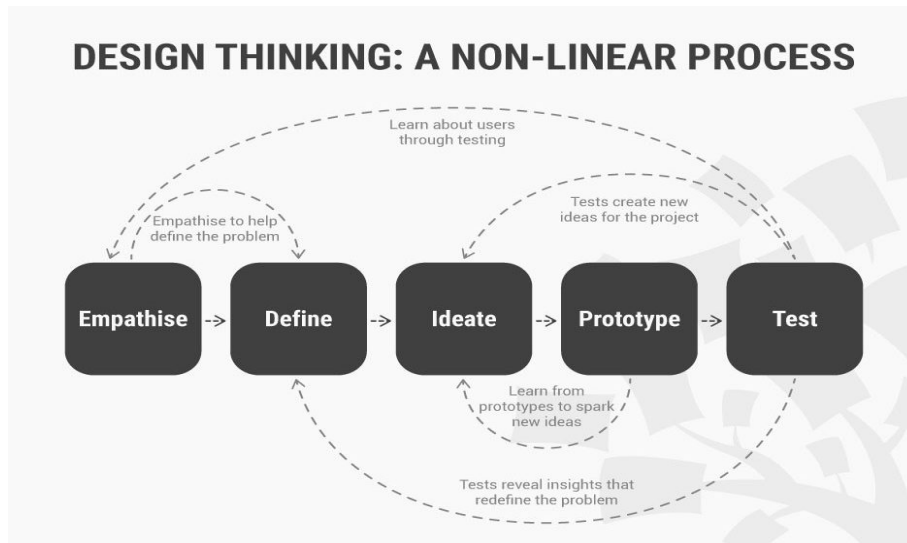
## Process



Figure 1: The Stanford d.school Design Thinking process

Source: [https://pbs.twimg.com/media/DVHpR4QVwAE56EN.jpg]

Applying the Stanford d.school methodology, the E.T. team tackled the wicked problem of ethics with regards to novel online services by following the five phases, as described in the d.school Bootcamp Bootleg. These phases - empathize, define, ideate, prototype and test - were reiterated every week in order to reduce bias towards action and to embrace experimentation. As such, feedback was collected from people with different backgrounds so that new and unique insights were accumulated every single week. Continual improvements for the team's ideas and prototypes were assured by this method.

This section will describe what was done during each of the five cycles and explain step by step how this process led to the final prototype. Each cycle is characterized by its own methods and will evidently show diverse focus points. Delineated per cycle will be the different phases, the methods applied in those phases and the consequences that cycle had on the continuation of the process.

It is important to note that before the design cycle began, the team created a standard template for the PowerPoint presentations to be used during the weekly presentations to ensure consistency and ease the process of describing the weekly findings. Moreover, the team divided all the tasks so that two other people did the first three and last two stages every week. Additionally, every week, a different team member was responsible for writing a weekly recap so that no information would get lost in the process.

## Phase 1

### Empathize

From the very beginning, the E.T. group showed interest in the complex topic of ethics in the era of Artificial Intelligence (AI). However, at the beginning it was unclear what direction and approach would be adopted, since there was no real, concrete problem statement. The team's first focus point was therefore to think about all the different aspects this topic concerned and come up with a refined, concrete problem statement in the landscape of ethics in AI. From that point onwards, each group member aimed to address the main topic of interest by interacting with people via technology or in person. Interview preparation consisted of formulating appropriate questions so that users of different types of technologies could identify themselves. In this way, valuable information was gathered. Fifteen people, mostly fellow students and employees, were interviewed by means of the interview for empathy method. Some of the questions were:

- "What do you think and how do you feel about AI?"
- "How can we come up with the right ethical guidelines with regards to AI?"
- "What do you know about data collection on social media?"
- "How do you feel when companies use your data in order to improve their services?"
- "What do you think about robots?"
- "How do you feel about the apps on your phone?"

Many responses to these questions corresponded to roughly the same attitudes. Some examples of answers that people gave related to social media. Many of them did not think that these services could gain much from their personal data, even though they were all active users. In addition, many of them indicated that as long as they know what is happening and how companies use their data, they do not mind if their data is being collected and used. Regarding AI in general, most individuals think that robots are scary and are worried about what could potentially happen in the future. Importantly, their fear centred on any robot that can outperform humans. It became apparent that fear was an incentive in many topics relating to AI. Many interviewees expressed their concerns about AI, but also pointed out that governments should issue legislation to keep people safe, while their needs would still be fulfilled. Another task governments should fulfil is to inform people about general data protection regulations throughout media channels. Without this education individual users cannot be expected to stay safe in the contemporary online landscape as depicted in the introduction.

### Define

After the empathize phase, the team gained initial insights into people's needs, feelings and attitudes with regards to AI and ethics by observing, engaging and interacting with them. In order to successfully define a problem state, the Point-of-View Madlib method was used by identifying users and their needs through the sentence: "[USERS] need [USERS NEEDS] because [INSIGHT]".

By addressing users' needs and insights, the team came to the conclusion that people need to be aware of AI technologies (like Netflix, Smartphone, Data-Collection), because companies can easily manipulate users who are not aware of potential consequences. As the empathize phase showed, most individuals are simply not aware of what data is taken from them and what is then done with that data. As a later cycle will show, the most important theme in these interviews was fear and how to cope with that fear. Until then and for lack of a better modality, the research question in this phase was formulated as: "How can we make people feel safe when using social media applications?"

With this initial problem statement, the scope of the research was narrowed down from general emerging technologies to social media applications. The empathy stage revealed that many users were pulled towards social media applications when talking about the subject. The team noted that this scope should be kept under attention in the successive cycles.

Due to the fact that people are afraid and poorly informed about technologies and policies, further measures about policies were urged be explored in the following cycles. Variables such as information transparency, fear and education needed to be emphasized. Especially transparency, i.e. knowing what data services collect and how they use it, needed to be formally addressed in the coming weeks. It was recognized that this had the potential to be a main focus point of the team's wicked problem. On the other hand education might fulfil people's need by teaching them how to safely use applications in order to reduce potential dangers on the internet.

## Ideate

In this ideation phase, team members sought potential ways to narrow down and pinpoint the problem statement, or at least come to potential focus points that could be addressed to answer the problem statement. Initially, brainstorming methods and pen and paper were used for sketching ideas. The goal was to come up with a simple prototype interface that would help users understand how their data is collected and used. The goal of this prototype was to educate individuals about the services they used, what data was being taken from them on these services and what they could do to use these services responsibly. In this interface, every user would be able to specify which services/apps they were using, so everyone would have an overview of their apps and potential dangers related to these apps.

## Prototype

Due next was to create the first prototype; one that aims to be tailored to individual users, their specific apps and services and the consequences these have on the users.
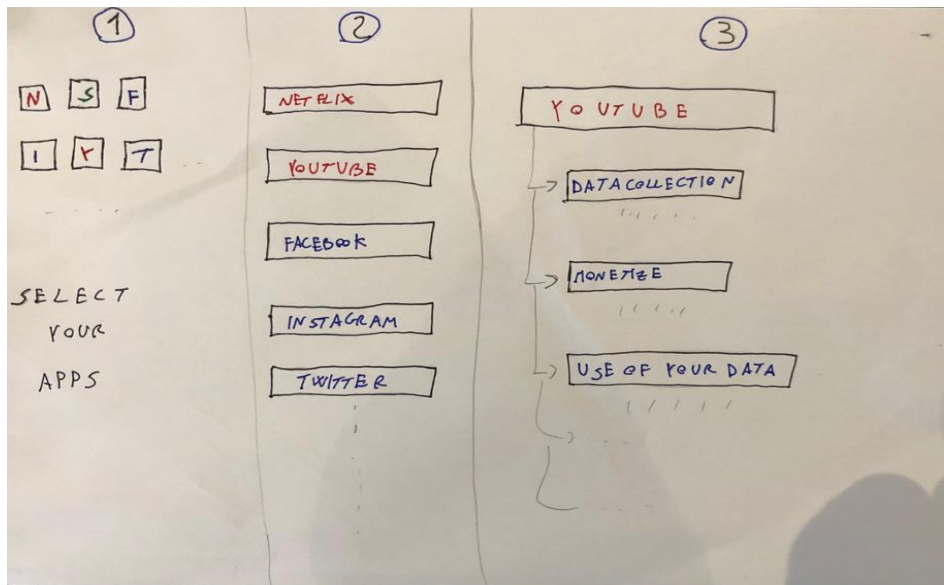


Figure 2: Prototype one – a simple interface

Intuitively drawn on the sketch paper, this initial prototype let users choose the applications and services they are using the most from a huge database of services. Each of the service that is chosen will thereafter be presented in a concise and clear menu. For each service, collected data would be shown, in addition to how the specific service is gathering data, how they are tracking user movements and what kind of techniques and algorithms they are implementing into their services. For example, the prototype would explain to users of Netflix that this app uses different kinds of machine learning algorithms in order to gain insights into their customers' behaviour and to make new movie recommendations. Additionally, the team adopted a holistic approach with the components inform, educate, act and support. In other words, the service aims at informing and educating users, so that they can act in a responsible manner and can receive support where necessary. Figure 3 illustrates the different aspects of the service.
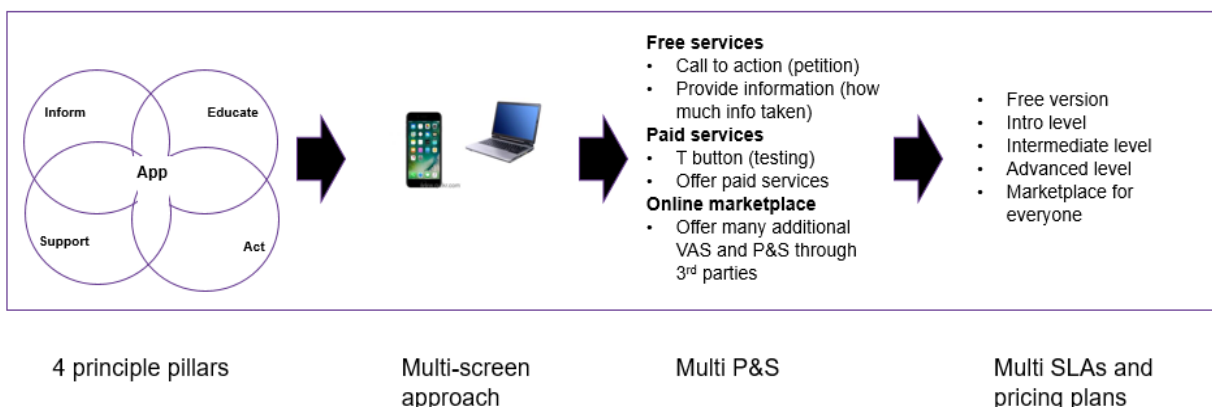


Figure 3: Holistic-driven components of the service

### Test

In class, the team introduced their first basic prototype and collected feedback. This feedback was very diverse and forced them to focus on new aspects in the coming cycles. Firstly, it was suggested to add external hackers to the service who could check how personal data was actually being collected and used. Naturally, challenges would be faced when trying to figure out how social media actually succeeds in doing that. Secondly, methods should be adopted in the process, similar to those used by the large companies that we are investigating. Thirdly, petitions for users to sign to request changes in government policies were thought of as potentially valuable. Lastly, giving users daily feedback on what information has been taken by external companies will be effective in keeping them engaged. A Johari Window analysis was said to be helpful here, since it shows what is known and unknown to users.

### Conclusion

In the first cycle, priority was given to defining a concrete problem statement. Based on collected data and feedback during the first three phases, education and transparency were identified as users' needs. Fear was also indicated to be a driving force in users. Based on these needs and insights, the team came up with their first prototype and collected feedback. In the upcoming cycle, the aim is set to refine the problem statement further and investigate to what extent this affects the needs of potential users. Interacting with these users stands central in the coming cycles.

### Phase 2

#### Empathize

Taking the feedback from the previous cycles into account, the team added security testing to the app's functions. This function will be in a crowdsourcing format, where certain challenges are presented to the community of our users and where they can each decide if they accept those challenges to gain some sort of reward. Additionally, the team was encouraged to give feedback to users while they are using the application, through pop ups or instant chats. Finally, different type of products that could potentially secure our service will be suggested in this cycle.
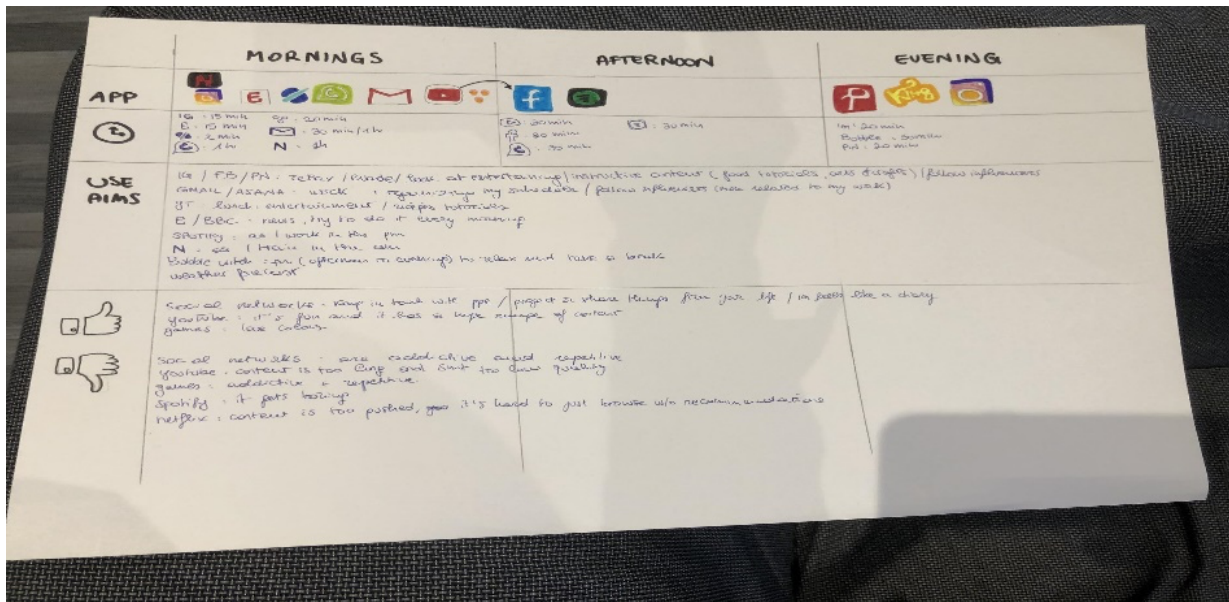
Figure 4: Journey map

Firstly, the group aimed to dive into the subject of specific users' applications. In order to find out which services users use and for what purpose, a journey map was applied. The team tried to find out which services users are relying on the most throughout the day. After conversing with them, it was evident that the time of day was a key factor for determining which services were used. Users indicated that they used different services during mornings, afternoons and evenings. The journey map interviews not only identified the exact amount of time spent on each application, but also why applications are used, what was liked and what was disliked about the applications. These insights made the team aware of the fact that Facebook, Youtube, Spotify and Instagram were the applications most used throughout people's days. These services were primarily used for entertainment, creativity and socializing purposes.

Based on these insights the E.T. team interviewed more people to dig deeper into their rationale for using the applications. This confirmed most of the findings already known, but an emphasis arose on the privacy of cookies. People were not aware of how and why cookies are used and what they are used for. As such, this cycle delved into the subject of (cookie) transparency further. Moreover, based on the feedback accumulated in the previous week's class, the Johari Window (Figure 5) was constructed. This method confirmed the hypothesis that people know that there are certain consequences to using online services, but that there are many things that they are not aware of. Fear regarding this unknown aspect of the online services was a recurrent theme, along with data transparency. All these insights were very useful for the team since they gave us an understanding of what to focus on.

| **OPEN** • All large companies collect data about me | • I freely give away personal information which is valuable and could be used against me | **BLIND** |
|---|---|---|
| • Data collected is sold to advertisers or 3rd party companies for their commercial or political means | | |
| • But I don't have to pay to use services such as Facebook, Twitter, etc | • Many companies take and sell my data without even asking permission for it | |
| | • Many companies take my data even when I am not on their website | |
| • I sometimes post negative comments to try to get likes | • Getting likes is an important way to increase my status among pears | |
| • I use Facebook or other social media to 'show off' and to gain approval from other people in my network of friends | • I sometimes feel envious or depressed when seeing success of pears | |
| **HIDDEN** | | **UNKOWN** |

Figure 5: Johari Window

## Define

Findings from the previous phase showed that the initial problem statement was too narrow. We encountered difficulties in finding the right terminology, since the team did not want to limit themselves to social media applications, but wanted to include other kinds of novel technologies as well. Finding terminology that better suited this wider range of technology was the current challenge here. In this cycle, the previous problem statement was redefined to: How to make people feel safe when using the World Wide Web?

## Ideate

During the empathize stage, the feedback from the interviews indicated that users who were not aware that their information is used by technology companies immediately showed a sense of fear and rage when they found out. This triggered an idea to use fear as an underlying theme for all the different aspects of the service. However, this also led to the question of how to ensure that the end users will continually return and use the product on a continual basis if they are constantly getting scared. To find out, the team looked at current events and saw an important political trend which had been spreading around the globe: the rise of populism within Western nations. The team looked at the methods which populist leaders use and decided to emulate one of their most common methods: the ability to create or greatly exaggerate a problem and then claim to be the only solution to this same problem. Products such as those described by PK Dick in his 1955 short story (The Hood Maker) were used as an inspiration for online marketplace section. Those ideas contributed in adding physical products from which user can protect their privacy.

## Prototype

A holistic approach was adopted to come up with a new prototype. The main goal through this approach was to provide a service in which users are informed, educated, can act and are supported with regards to the World Wide Web. By taking a populist standpoint, a range of political stances that emphasize the idea of "the people", the team thought of ways to induce fear by means of online marketing campaigns, for example in the form of a video. After triggering this emotional state in users, their attention will immediately be directed towards a solution that is provided by the online service. This prototype thus aspires to create a problem in the form of fear followed by a solution in the form of the offered services. What these services include was still to be defined at this stage. This solution is derived from populist ideology by virtue of the application. In this solution, the service will clearly and intuitively explain everything about users' online services and application. This information includes how those services manipulate their data, what the consequences of not being aware of that are, current ongoing unethical procedures and more. When it comes to educating users, the focus is to provide them with ways to use services in the safest possible manner by providing them with tips and tricks with regards to online presence and educating them about good and bad practices. Not only that users obtain tips on safe passwords, cookie cleaning behaviour, but also software and physical products were added too. On one hand, software like ad blockers and VPN services. On the other hand, physical products such as: Anti-facial recognition glasses and masks, bracelet against devices that eavesdrop has been emphasized. E.T. team would provide services to their users including free and premium software that keeps users safe, plug-ins that track what information is shared and information about unsafe online services. When it comes to support, additional services are given by facilitating a space where people can share solution and can engage with other users in order to create a community in which everyone is kept safe in the online landscape. Lastly, this prototype was designed in a multi-layered way (see Figure 3), so that there are free and paid services that users can benefit from. Free services are included in the limited package, mainly set up to entice people to use the service. Paid services are more profound in the sense that they have more impact on users' online safety. A Freemium model is adopted here: try to get as many people as possible to use your service with free options and then bind them further with paid services.

## Test

The first video, purposed to induce fear, together with the first makeshift prototype were shown via a PowerPoint. The most common response was fear, particularly evoked by the video, which we can then consider successful. Moreover, people indicated that they were interested in the products that were offered in the prototype and the general idea of being protected from big data-driven companies by an external service was greeted with positivity. Some people pointed out that they did not feel the need to be protected at all, because they did not have anything to hide. However, as the team argued and as was confirmed by

the majority of the class, these people are still within the target group of the offered service. Key for these people is to create intuitive and visual information of concrete data that is taken from them, so that they become more aware of what is happening in the online environment which will eventually lead to an attitude shift.

By virtue of this feedback and the testing phase, further development should focus on creating a data-driven product, perhaps by focusing on one particular aspect of the service. Information accessibility should also be taken into account. Another goal would be to make the service sizable and readily and intuitively interpretable. After achieving this, more people will get interested in the service due to the fact that they are more aware of what is being taken from them on a daily basis.

## Conclusion

This week's aim was to furtherly delve into user needs and to create a tangible prototype that users could interact with. By means of a video the team successfully managed to induce fear in users and learnt that people would be interested in the service after watching this video. Importantly, directly providing a solution to get rid of this fear as well as making the service intuitive and clear should be the next focus point.

## Phase 3

### Empathize

The previous week the team tried to induce fear in their users by using a populism-driven video. This video specifically targeted people who use online services but are less aware of consequences of using those services. After doing so, the service immediately provides the opportunity to stay safe while using these services, so that they become engaged with the service. By providing additional services like products, online communities and marketplaces user engagement will be achieved.

The team also decided to monetize their service by offering multiple layers of services; some free, some paid. The more profound the consequences of the offered help, the more the user will have to pay.

Based on previous week's feedback, the conclusion was reached that the video indeed induced fear. Moreover, people indicated that they would be interested in the provided products provided and that they appreciated the idea of being protected by an independent party. On the other hand, some people indicated that they did not feel the need to be protected because they do not have anything to hide. Those specific people can be convinced to use the service if either more fear can be induced or it can be made very transparent and intuitive about what data is being stolen from them for what purposes. Moreover, making the service more data driven opens up opportunities to cater to more individuals and to make information accessible to more people. Information is already out there, the team should focus on how they can make

this sizable and interpretable. When this is achieved, people who think they have nothing to hide can also be targeted.

As this cycle happened during two weeks instead of the normal one, it will be described in more depth than other cycles. Firstly, it was decided to focus on developing a tangible prototype, so that potential users can interact with the prototype. This was thought to be the best course of action since a lot of insights were already collected from potential users, meaning that user needs and driving factors were understood. Therefore, in the empathy stage, two methods in the form of prototyping for empathy and user driven prototyping were applied. User-driven prototyping gives the opportunity to learn more about how the user interacts with the prototype and what the user's reactions are to the prototype. To do so, ten new users were provided with the previous prototype and were asked to interact with it without any further instructions. All the subjects did this for about five minutes, after which they were asked the following in-depth questions:

- "How do you feel about the prototype?"
- "What do you feel is missing in the prototype and why?"
- "Would you re-use the service multiple times?"
- "What would make you re-use the service?"
- "How does the video make you feel and why?"

Based on the interaction with the prototype and the interviews, the team came to some overarching observations and conclusions. A more refined prototype is necessary to ensure meaningful interactions. Insights in what data is being taken by which particular service is meaningful and appealing. If and only if personal data gets stolen the service would be something users would come back to. Getting hacked would ensure a lot more users. Based on these insights, the problem statement was furtherly specified to a term that was better applicable than the WWW.

### Define
The problem statement became: How to make people safe when using online services?

### Ideate
By using the POV analogy method the service was reframed into a particular problem statement. It was already known that fear could be induced by means of the video and that this fear is effective in driving people to use the offered services, but it is not yet known how the user can be kept engaged and how the target group can be increased. Those two missing links were reframed into problem statements and presented to new potential users, with the following results:

How can it be ensured that the service will be used on a continual basis?

- Use plug-ins that warn people whenever their data is being scraped on external apps/services
- Gamify the service so that people gain points by becoming more secure. People can gain Privacy Points if they complete defined tasks. With these points more products can be bought or discounts can be earned.
- Fear. New ways have to thought of to make people scared so they are driven back to the service. This can for example be achieved with fake hacking, make extremely personalized ads, keep collecting relevant news articles and keeping the fear inducing video relevant.

How can the target group be increased?

- Identify different users by means of personas, as such:
  - Persona A: no affinity with technology whatsoever, rarely uses online services. Less relevant to the service, but little fear related to the services that they are using can already be effective.
  - Persona B: some affinity with technology, uses online services every day. More relevant. Inducing fear is still easy within these individuals because they are not entirely aware of the data that is being taken from them.
  - Persona C: a lot of affinity with technology, uses online services every day and for numerous applications. Typical response: "I am not afraid of my data being taken because I have nothing to hide". For these people it is important to induce a lot of fear so that they also become aware of their online footprint.

For all of these people, but the last ones in particular, it is pivotal to come up with clear, easy to understand visual information. Information about what data is being taken is everywhere, but nobody wants to read long forms and documents. It should be made as easy as possible for them to access what they need to access.

## Prototype

Because more focus on creating a tangible prototype was necessary, it was decided to create two separate ones and collect feedback on both of them so they could be compared.

Before doing that, the team identified what should at least be included in the prototype based on the previous cycles and phases:

- A fear inducing component
- My profile section: log in options, personalized items and subscription plan
- Privacy Point system: overview of current points, achievements, goals and levels. This should also be an overview of all the services that the user uses, the current status of points for particular services, an overview of the data that is being taken by each service and a clear overview what has to be done to act more securely per service. Moreover, it has provided options to become more secure per service. Transparency should be key here: intuitive and ease of use are crucial.

- Marketplace/community: online place where users can interact with each other and find more information, products and services that they themselves can use to become more safe.

The first prototype was created by means of Wix, a website building tool. On this website, the fear inducing video, an overview of the core principles, the marketplace and ways to leave feedback were present. This prototype can be seen in Figure 6. The second prototype was made with Adobe XD in which you can create vectors with which can be interacted. Here, users can create both informal and formal articles/posts about data collection, privacy, etc. They have the option to buy products and services and implemented a first version of the Privacy Point system. Figure 7 shows a glance of this prototype. It is important to note that this is not the final version of the application, here the group created the basic idea. The final version can be found in the final phase.
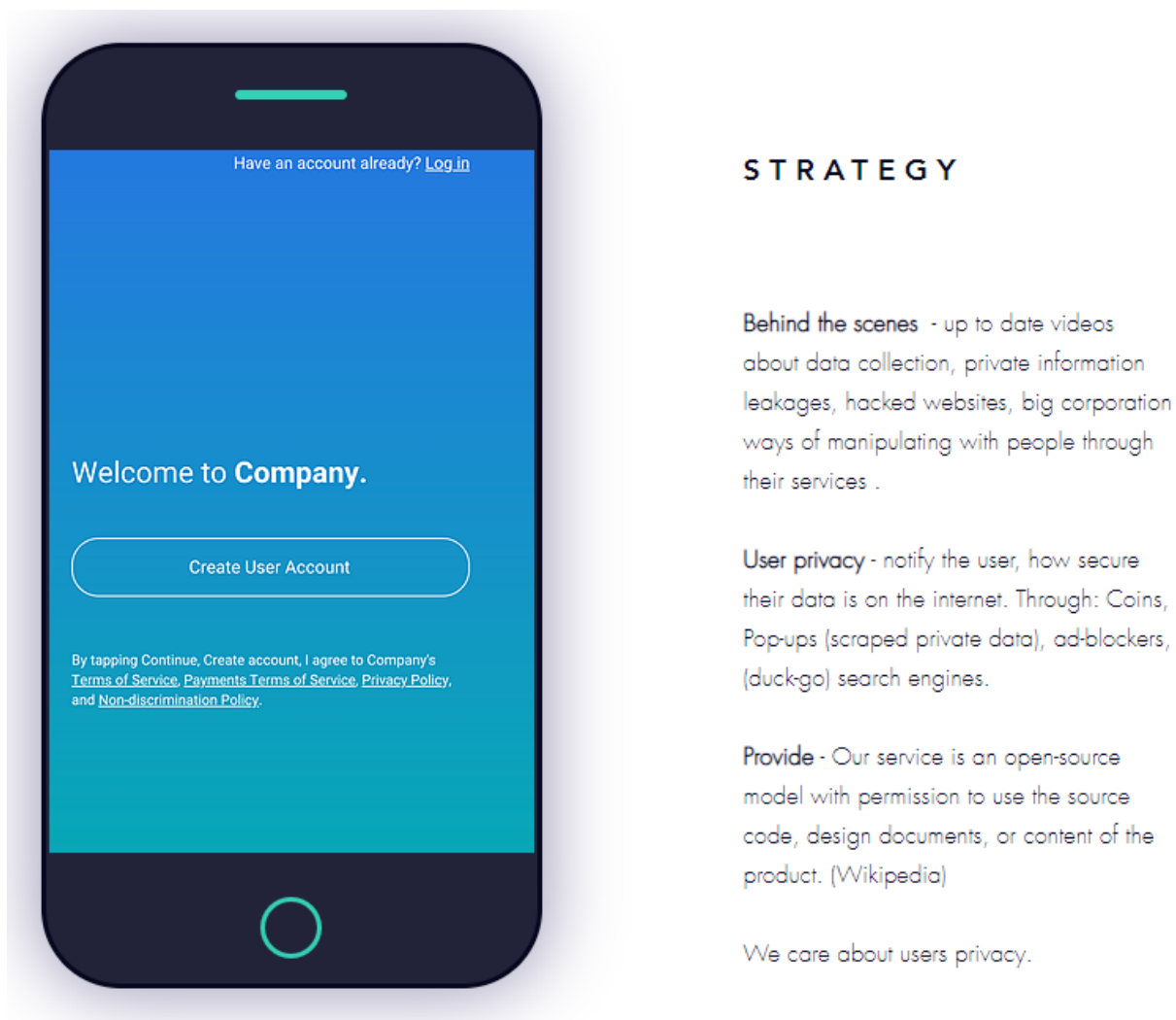


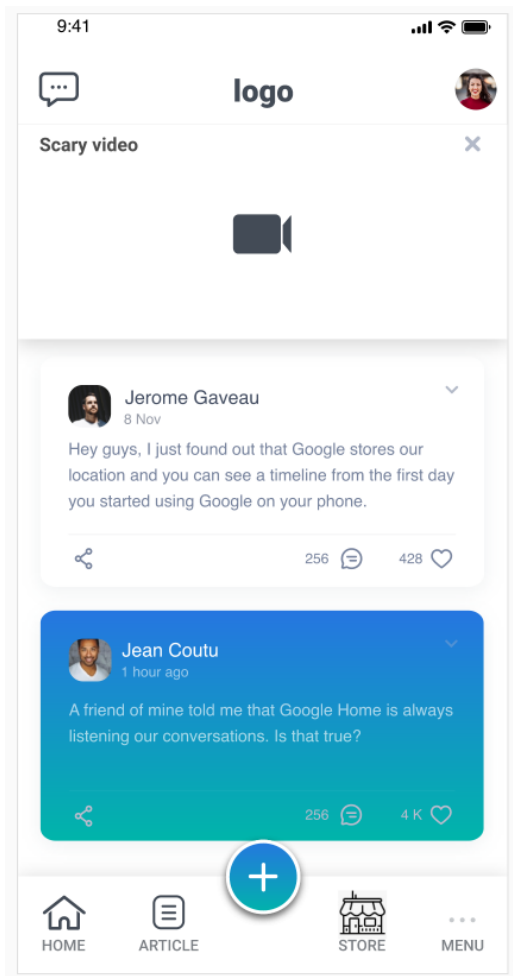*Figure 6: Web-based prototype*

For the full experience, visit: https://ecko4life5.wixsite.com/ddd023

*Figure 7: Adobe XD prototype*

For the full experience, visit: https://xd.adobe.com/view/ddd269a3-5c50-4932-866e-806a82aed3ec-8881/

## Test

After creating the two prototypes, they were tested with users and feedback was collected. It was found that there should be a clear distinction between posts and articles, based on the background of the creator. As such, not every user should be able to write articles, only if they have a valid background. People also indicated that they would like a news feed where they can save their favourite articles. Also, more products and congruently a product recommender system would be appreciated. Fear should also have a more prominent place and there should come a system in which it is explained how users will be engaged.

## Conclusion

This phase there was a primary focus on getting a more tangible prototype so that users can interact with the prototype. A lot of time was invested to make these look good and so that a foundation was created on which could be built in the coming weeks. After presenting the prototypes to the class, the team concluded that a focus on engagement of users is necessary from this point onwards. It is established that fear is strong driving factor, now ideas to scare people in an innovative and data driven way should be thought about.

## Phase 4

### Empathize

After presenting two different prototypes the previous week, the team obtained feedback from class and combined it with the feedback received from other end users. Based on this, it was identified that too many pop ups would be considered annoying and should thus be limited. Moreover, it was found that it would be more interesting to focus on data driven approaches to engage people than to further invest in a new prototype. Therefore, the team should come up with new data driven marketing approaches that manipulate fear and that keep users engaged and re-engaged. These became the focus points of the week. Hence, the focus now shifted to marketing, where the empathize and ideate phases will explore how to use a data driven approach to induce fear in marketing.

To do so, a Beginner's Mindset during a Story Share-and-Capture method was adopted, by asking the following questions to potential users:

- "How do you feel about sharing your data on online services?"
- "What made you scared or would make you scared with regards to online data?"
- "Sketch a situation in which a company crossed/crosses the line with regards to online data."
- "Give some scenarios in which an algorithm used/uses your online data."
- "What would make you scared in the context of online data?"
- "What needs to happen in order for you to seek help with regards to online data?"
- "How could data be used to engage with online users?"

Based on these questions, 6 people were gathered and questioned together. They were specifically instructed to share about the experiences they had with regards to the questions and to comment whatever came to their minds based on other people's experiences. From those interviews, a few recurrent observations were recorded. For example, almost all individuals were not aware of what data is being taken from them. They said that relevant news articles and facts would spark their interest in the service and would keep them enticed. Also, most people are aware of the fact that there is a lot they do not know about online services, but they either choose not to get educated about the consequences of online data or do not have the proper means to do so. Lastly, people are most scared of personal photos and messages to be leaked into the open.

### Define

Because this cycle there is a focusing on the market aspects of the service, the problem statement was updated to: How can data-driven fear be used in online marketing?

## Ideate

To accumulate ideas based on the empathize phase, the method Saturate and Group was used in combination with a brainstorm. Input from the interviews was as such grouped and the group brainstormed about potential ideas to use data-driven fear in marketing campaigns. From these methods, the following ideas came to rise:

- Give people the impression that not only machines but also humans use their data
- Limit freedom of users and spread fake news articles
- Give users relevant news like the cyberattack in Maastricht
- Create very personal ads by showing users their content of three weeks back
- Show users very specific data that was scraped and how it was used/manipulated
- Create ads based on what users said face to face (what WhatsApp/Instagram is already doing)
- Show users messages they themselves sent to other people
- Show users porn videos they watched
- Give friend suggestions based on people they just met face to face
- Convince people that an institution they are part of was hacked
- Show private personal photos
- Give the impression that a big company was influenced by fake news and show what consequences this has
- Use fear of missing out to stimulate people

Additionally, during this stage, the different aspects of the Marketing mix were identified and highlighted for discussion. The four main areas of the Marketing mix were used as a basis and each of them was further defined and discussed. Perhaps the most important of these four is the pricing aspect and for this, it was decided to initially offer the P&S for free in order to increase the customer base and then slowly add more complex paid products which could be purchased for a fee by the end user. Although the product prototype is digital in nature and does not have any offline presence, a part of the promotions would take place offline. The initial target segment would be university students and hence there would be offline promotions which would take place on campuses and joint work would be done with university associations. The promotional material to be used would all have the underlying theme and objective of creating fear within the users as a method to stimulate them to use the product.

After gathering all the feedback from the empathy and ideate stages, the group decided to create another prototype with the purpose of inducing fear in users and incentivize them to use the application. This prototype is based on Facebook data, particularly the profile information (name and surname) and all the applications and services that make use of user's Facebook data. More details can be seen in the prototype, including a Python script which creates scary memes. As shown in the Figure 8, first a user profile is added to a dictionary of all users and then, as showed in Figure 9, personalized captions can be created to a specific image to create the final meme

**Create a personal profile**

```python
# dictionary of all users
users = {}

## create keys with empy values for single user
key_list = ["Name","Surname","Gender","Apps_websites"]
user = {el:0 for el in key_list}

## fill in the dictionary
user["Name"]= name
user["Surname"] = surname
user["Gender"]= gender
user["Apps_websites"] = series.tolist()

# add the user with id 0
users[0]=user
```

*Figure 8: Python script for creating user profiles*

## Prototype

```python
#import the meme generetor
from memegenerator import make_meme

# personalize captions
user_name = users[0]["Name"]
number_apps = len(users[0]["Apps_websites"])

# create captions
top = user_name + " Facebook is whatching"
botton = str(number_apps) + " apps have been using your data"

# generate meme
make_meme(top,botton,"m13s8.jpg")
```

*Figure 9: Python script for creating personalized captions*

The output of this prototype can be seen in Figure 10.

*Figure 10: Output of the prototype Pyton script.*

### Test

After testing the personalized meme generator the team noted that the output was quite funny, which actually makes sense because memes are often associated with fun. This prototype was therefore not too relevant in our service because the team was looking to induce fear. Feedback for the Marketing aspects was positive as this was indicated to the right direction. The model for monetization was viewed as a tried and tested method for success.

### Conclusion

While the development of the look and feel along with some basic design aspects of the product prototype have been created in previous cycles, the feedback received indicated that further work needed to be done on defining the Marketing and Sales aspects of the product. Hence, this aspect was put through the different stages of the design process for improvement and the feedback received was positive.

### Final Phase

This final cycle was mainly dedicated to choose among all the ideas and prototypes a specific product and explain how it works. The team started by gathering the main feedback they received throughout all the previous cycles and how the final prototype would address that feedback and other issues that raised. Figure 11 shows the main aspects that our prototype had to address.

| NEED | WAY OF ADDRESSING IT |
|---|---|
| People do not know how to **protect themselves** from companies/services/products which take and use their data | Create a product not only to inform and educate them but also to act and support our users. |
| People need to be **engaged** with the product in order to use it overtime. | Create a product based on social media features: chat, post, game points |
| People need to be **scared** in order to use the product | Fear marketing strategy based on personal data |

*Figure 11: Main aspects for prototype to address*

Once the most important aspects of the final product prototype had been identified along with the Marketing strategy, the group decided to focus on:

1. A scary video based on Facebook data as a data-driven marketing strategy with the purpose to attract users toward our social media application.

2. Social media application not only to inform and educate users about data privacy in general but also to make them feel having fun so that they will continue using it.

The final video, which was shown during our presentation, can be downloaded from this google drive link: https://drive.google.com/file/d/1GzQmDqE1Yt0Jv1pje5EQtFcgCgJ2L8eS/view?usp=sharing

The final version of the social media application can be found here: https://xd.adobe.com/view/1186f228-e354-4a79-4229-576d98fd974f-67b7/

In summary, the main features of the product prototype are the following:

- **Home** feed: here users can share their informal thoughts.
- **Article** feed: this is probably one of the most important aspects of the application. The idea is to take advantage of the crowd and so allow users to create articles related to data privacy topics. The goal here is to give readers information that can be easily understood.
- **Store** feed: as previously mentioned, our purpose is also to allow users to act. For this reason, in this tab, the app offers different products and services which can be either free or paid, to give users tools to protect themselves against companies.
- **Game points:** The goal with this feature is to engage users with our application, the more they use our app and the more they buy products or services, the more points they gain and as a result they can have discounts when buying in the store. Points can be seen in the personal page of the user.

In conclusion, the final prototype was based upon two key components, namely a fear, data-driven marketing strategy and a social media application. Both together form our final prototype.

## Discussion

### The idea and the product

In the 17th century, a Danish Prince named Hamlet, was heard declaring "Be not too tame neither, but let your own discretion be your tutor. Suit the action to the word, the word to the action … whose end, both at the first and now, was and is, to hold, as 'twere, the mirror up to nature, to show virtue her own feature, scorn her own image, and the very age and body of the time his form and pressure" (Shakespeare, 1603). The advice given by Hamlet in the 17th century to the three players in this well-known play is still very much applicable and valid today when confronted with wicked problems. It is this advice that was used by the E.T. group when it looked for inspiration throughout each of the five steps of the process. The team looked around, held a mirror up to nature or in this case current events, and used them as inspirational building blocks upon which the product prototype was built.

While the techniques used by populists along with the dystopian visions of authors such as PK Dick or George Orwell were used as building blocks to define and further the team's ideas, it was the underlying principle of safety for the end user which was the initial inspiration. Although this idea evolved and changed, the underlying theme remained the same throughout the process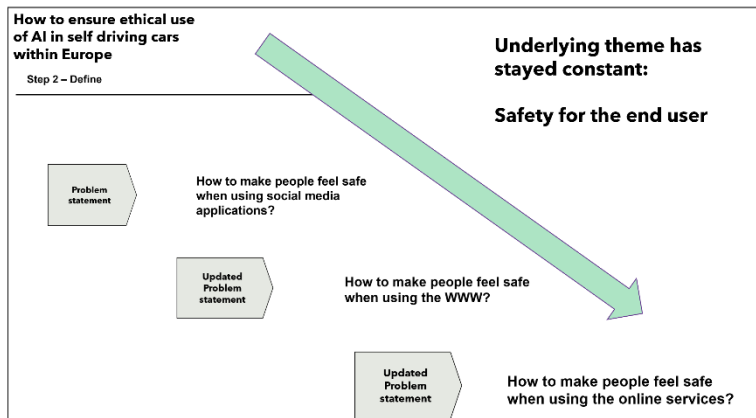 (Figure 12). The initial problem statement was to ensure the ethical use of Artificial Intelligence in self-driving cars, i.e. protecting users but because this target group was to narrow, this idea was quickly changed to safety among individuals using social media and then finally to safety for online services – to include even more people.



*Figure 12: Problem statements throughout the process*

With each iteration, as the team's ideas evolved further, the question of how to create a sense of urgency and induce the end user to utilize the prototype on a continual basis emerged. This question came directly from the feedback given during the interviews along the process, which were done to construct both a Johari window and an Empathy map during the second iteration of the empathize phase. The solution to this problem was to use techniques similar to those used by populists and to leverage one of the most basic and

powerful human instincts; that of fear. Once the building block of fear was defined as the underlying principle, the flow of ideas became like H.P. Lovecraft's famous 1926 mythical creature the Cthulhu, with numerous tentacles moving in all directions (Figure 13). Notwithstanding, these ideas where set within the four principle pillars of the prototype (Figure 13, right side) which were to Inform, Educate, Support and Act. These principles are based upon the positive desire to provide safety when using online services while at the same time provide an entry point from which fear will be induced in the end user. The four pillars are centred around the principle of user contribution to the application. Here, the user can interact and contribute with ideas, thoughts and most importantly, provide data. It is around these principles the different Products and Services (P&S) were further envisioned.
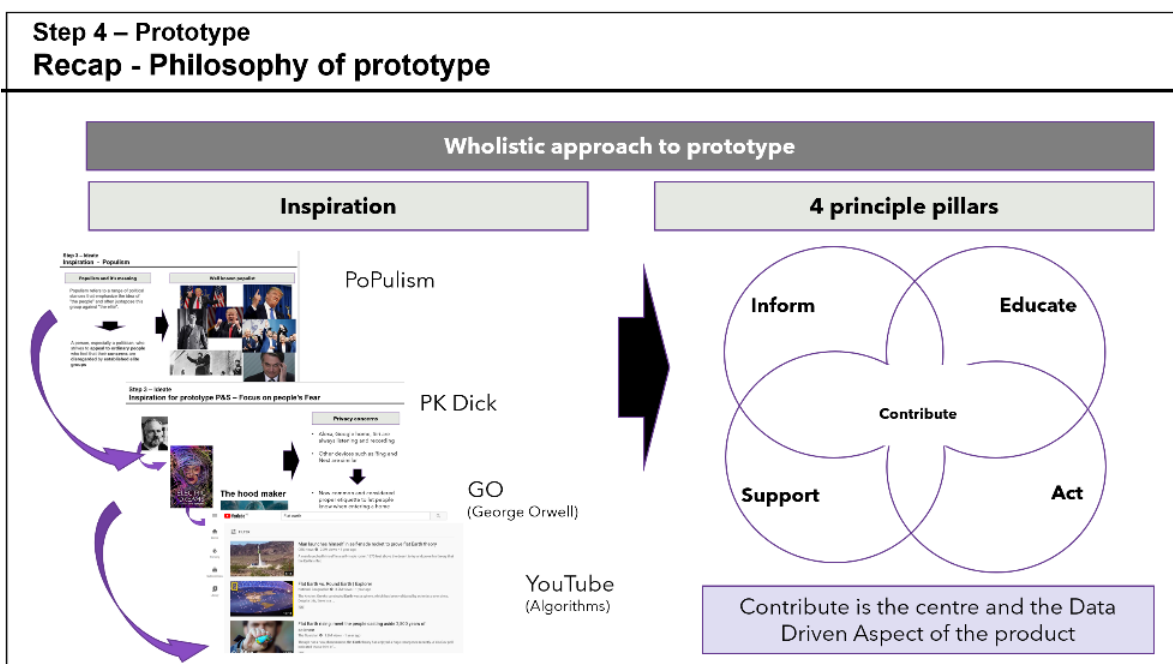


*Figure 13: Inspiration for approach used and four principle pillars*

## Product benefits and limitations

One of the key aspects of the vision was to ensure that a wholistic approach was taken when defining the different aspects of the prototype. By doing this, the team ensured that an end to end solution was reached and given to the end user, so that their needs are fulfilled and a solution for those needs is provided. Perhaps more importantly, it is around these principle pillars that the data driven aspect was implemented. As seen in Figure 15, within the areas of Inform and Educate, there will be an online forum where users can share and add content about their experiences and issues.



*Figure 14: Sample of marketing materials*

A part of the online forum will contain a Quantified Self section in which users will be able to share their self-tracking data on what actions they have taken to protect themselves online along with the results. By sharing detailed experiences, they will be helping others but at the same time provide data to the application. Additionally, within the other two pillars of Act and Support, the users will be able to participate in online surveys where information will be gathered and subsequently shared. Furthermore, similar to Amazon Turk, there will be an area where companies can offer paid surveys for users of the service. This has multiple added benefits as it drives traffic to the app/website, thereby increasing the user base with subscribers who will return on a regular basis. It will also provide revenues for the app as the ET Group will receive a hosting fee from the companies offering it. Finally, for the companies offering and paying the surveys it will provide them with access to a clearly defined market segment.
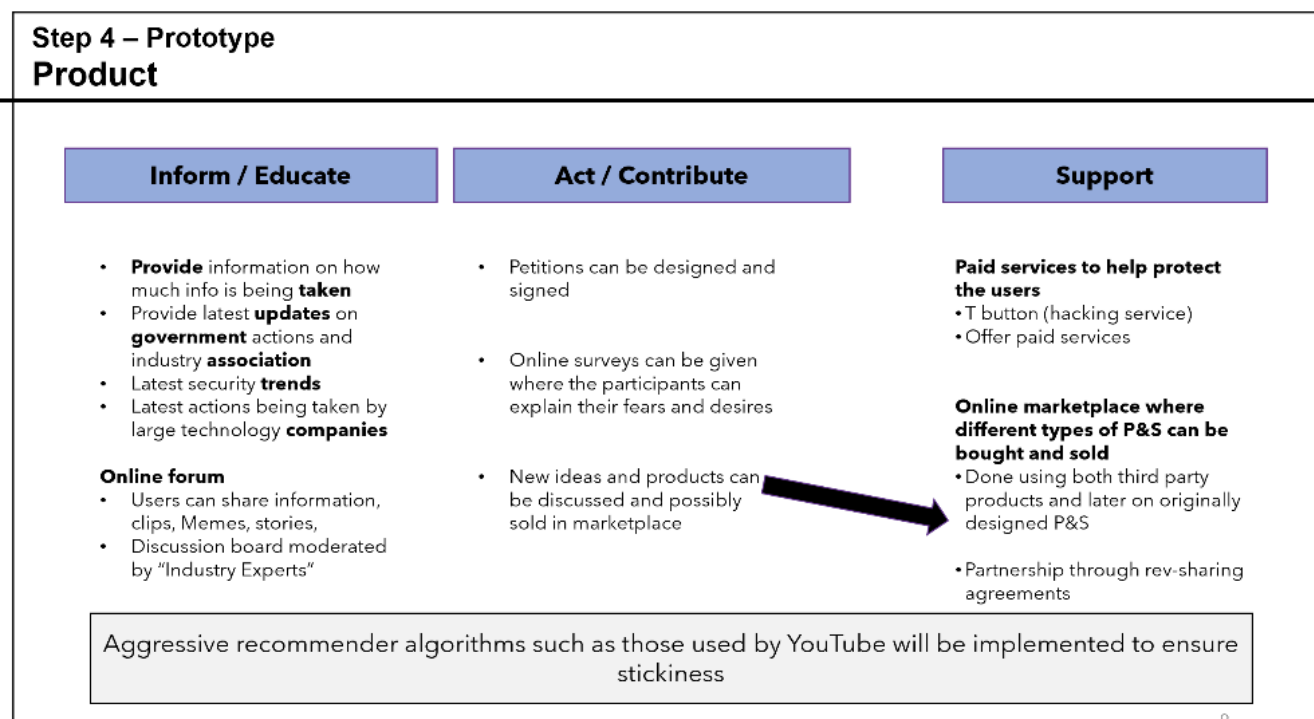


**Step 4 – Prototype**
**Product**

| Inform / Educate | Act / Contribute | Support |
|---|---|---|
| • **Provide** information on how much info is being **taken**<br>• Provide latest **updates** on **government** actions and industry **association**<br>• Latest security **trends**<br>• Latest actions being taken by large technology **companies**<br><br>**Online forum**<br>• Users can share information, clips, Memes, stories,<br>• Discussion board moderated by "Industry Experts" | • Petitions can be designed and signed<br><br>• Online surveys can be given where the participants can explain their fears and desires<br><br>• New ideas and products can be discussed and possibly sold in marketplace | **Paid services to help protect the users**<br>• T button (hacking service)<br>• Offer paid services<br><br>**Online marketplace where different types of P&S can be bought and sold**<br>• Done using both third party products and later on originally designed P&S<br><br>• Partnership through rev-sharing agreements |

Aggressive recommender algorithms such as those used by YouTube will be implemented to ensure stickiness

*Figure 15: Principle pillars and congruent implementation of services and products*

In spite of the wholistic approach taken when designing the product, the key limitation to the current service is that it is a technological solution to a structural problem. The structural problem is that the laws governing the security on the web have not yet caught up with the current technology allowing many of the large technology companies to act in an uninhibited manner with regards to consumer data. For this to change, amendments to the current set of governing laws would need to be enacted. The prototype was not designed to change the structural problem but instead to make end users feel safe when interacting on the web. Hence it could instead be considered a tool from which the user can better understand aspects relating to their security, purchase P&S, which can better protect them and moreover act as a springboard change. For

example, one of the four pillars is 'Act'. Within this area, the users can create and sign petitions which can be sent to government agencies demanding change to the current set of laws. Another potential limitation to the product is that it could be used to promote ideas and products which could be used for profit, political gain and/or power. For example, special interest groups could try to influence the site and its users for their own gain which is sporadically in the best interest of the users. While internal safeguards such as the ET Group, code of conducts and company policies could be put in place, this risk will always remain a challenge to consider. Furthermore, the data which will be collected on the users will never be sold or given to third parties.

## Challenges faced throughout the process

During this process there were three vastly distinct types of challenges which the team faced (See Figure 16). The first was that of alignment between the different team members. This type of problem can be considered a tame problem and is one which can be found in any large multinational organization. Notwithstanding, this was quickly solved through the introduction of a responsibility matrix where the altering role for each team member was assigned to ensure fairness and accountability.

The second set of issues are specifically related to the design school process itself. The process requires the users to obtain feedback from different people within a short time period. In this particular case the feedback and interviews took place with people who are known and within the immediate circle of acquaintances.



*Figure 16: Challenges faced during design process*

As a natural tendency, most people tend to associate with people of similar mindsets, meaning that the majority of interviews were done with people of the same background, i.e. Western Educated Industrialized Rich Democratic (WEIRD) and of the same age group. Trends and feelings about things such as values, emotions and ways of thinking vary across different societies so that by having a uniform set of participants, the possibility of receiving a completely different set of ideas is drastically reduced. Additionally, as the

size of these interviews and discussions were small, the feedback is not necessarily generalizable (Herich, J., Heine, J., & Norenzayan, A. 2010). The solution to this problem was to reach out beyond the initial set of people interviewed to get a different set of ideas and opinions. However, this option was not possible during the latter stages of the process due to logistical restrictions (COVID-19).

From a content perspective, the main challenge was to ensure that the prototypes created a strong sense of fear in the end users in order to stimulate the use of the product on a continual basis. This challenge materialized in both the Marketing aspect as well as the P&S definition and is a lighter version of a wicked problem as there is no right or wrong answer. Hence, the solution was to focus on P&S which best met the needs of the potential end users based on the feedback received. Another challenge which the team faced was that of choosing which idea to take forward to the next step of the process and which ideas to discard. This was again a light wicked problem which could be solved with a similar solution to the previous one, in which the best fit for the perceived needs of the end users was selected.

## Insights gained from process

The d.school design thinking process has both its proponents and detractors, with both sides of the debate questioning the reasoning and results of the other. By running through the design process five times the team was able to understand both the limitations and, more importantly, the benefits of the process. The process itself is very intuitive in nature and follows a common sensical approach towards problems solving due to the fact that it is very human centred. This could be seen by the fact that the team was able to change the problem statement so many times within a short time period. These changes were based on feedback and insights obtained in the multiple interviews which were done early on in the process and additionally highlight the flexibility and agility of the process. Several of the P&S definitions came directly from ideas and feedback given post presentation in the classroom. One example of this was to add a security testing function as part of the P&S offering.
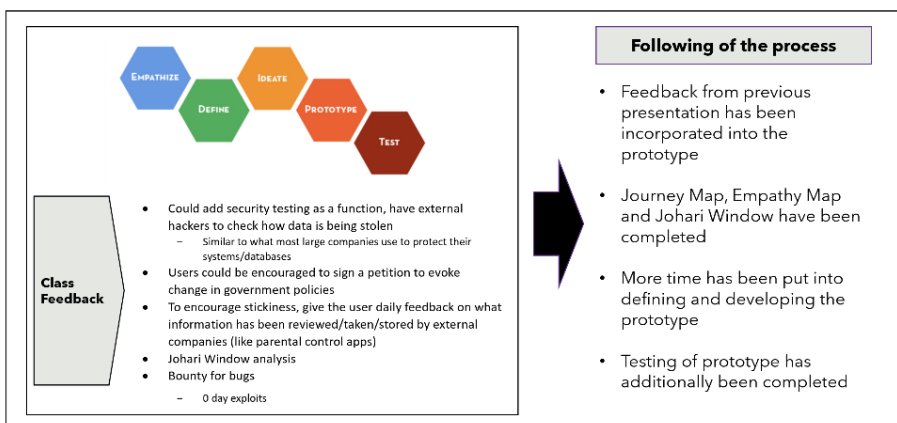


Further examples can be seen in Figure 17. Many times the ideas given by the participants were insightful and interesting and had a more traditional method of market research. If these were followed, it would have taken much longer to come to the present status.
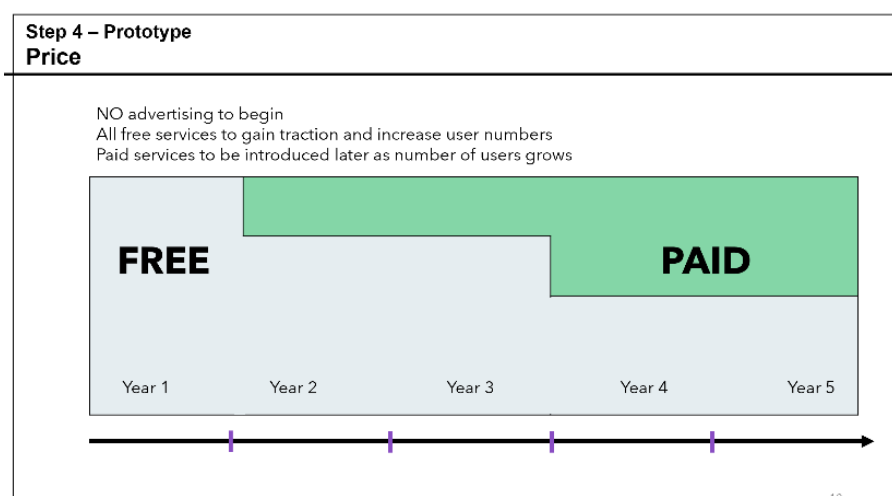
*Figure 17: Examples of changes in the service based on feedback*

Finally, the constant set of iterations of the process demanded a constant set of improvements and additions to the prototype, thereby creating a better prototype.

While one of the main benefit of this process is that it provides a framework for creating out of the box solutions and ideas in a quick and agile manner, the process itself has some limitations. One of these is the lack of scientific accuracy when collecting the feedback and data. The interviews are equivalent to a traditional qualitative in person study and as they are conducted in an informal and open manner. Hence, the feedback given is open to interpretation by the person conducting the interview. Secondly, at times, the process can seem wasteful as it looks at problems without considering previous work on the subject. For example, the method of 'Having a beginners mindset' presumes that "Your assumptions may be misconceptions and stereotypes, and can restrict the amount of real empathy you can build. Assume a beginner's mindset in order to put aside these biases, so that you can approach a design challenge with fresh eyes" (Stanford d.School. Design Thinking Bootleg, 2010). While this approach seems fresh and exciting as it could provide new insights, it could act as a double edged sword due to its potential to be repetitive and possibly lead to duplication of previously failed solutions. This is because it does not start by building upon the ideas of others. Notwithstanding, this fresh way of looking at problems could lead to breakthroughs not imagined before.

## Product Monetization

Monetization of any product, especially a new one, is contingent upon having a viable and properly defined Sales and Market plan. Hence, the Marketing mix was defined using the traditional definition but it was then run through the 5 step process to obtain feedback and improve upon it's details. The main underlying driver of the marketing plan and hence the monetization plan is that there will be two primary segments: B2B and B2C. While the B2C plan assumes that the services will be given away for free during the initial years in order to build up the customer base as seen



*Figure 18: Product monetization plan*

in Figure 18, the B2B plan assumes that collaborations can take place with political organizations and interest groups. For example, one of the political parties had approached the ET group with the intention of collaborating to help spread their message. Therefore, there will be four overall different revenue streams: Revenue sharing of products in online marketplaces, paid premium services, B2B collaborations and B2B online survey charges.

## Conclusions

While the prototype in its current form is still a figment of the ET group's imagination, the team expects that within a short while, many similar apps and products following this exact model will become reality. This is due to the simple fact that the products and services contemplated to be offered through this app fulfil a need and like many products and services it preys upon the basic human instinct of fear. As Hamlet suggested, simply hold up a mirror to today's current events and see peoples reaction towards the COVID-19 virus to understand the power of fear. But perhaps this question can be magnanimously described by H.G. Wells when he sardonically wrote in his classic 1895 book, The time Machine "As I stood there in the gathering dark I thought that in this simple explanation I had mastered the problem of the world – mastered the whole secret of these delicious people … Very simple was my explanation, and plausible enough – as most wrong theories are" (Wells, 1895).

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