BUILDING BRIDGES IN BETWEEN ECHO CHAMBERS:

EMPOWERING YOUNG-ADULTS IN SOCIAL MEDIA NEWS CONSUMPTION

MSc Design for Interaction
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Acknowledgements

Dear reader,

I’m happy to present to you my master’s thesis, marking the end of an exciting journey. Before diving into the details of my research, I’d like to thank the amazing people who supported me along the way.

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All the best,
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Executive Summary

Social media has revolutionized how we access and share vast amounts of information, fundamentally altering the ways we interact, debate, and form opinions. Social media platforms have become predominant channels for information with personalization algorithms significantly shaping the content we encounter, thus, have a big impact on society. Initially, none of the social media platforms were created with the aim of delivering news. However, as their user bases expanded and their features diversified, a significant portion of their users began perceiving and using them as a news source. The research specifically focuses on the platform X (formerly Twitter), which is selected for its mission to promote and protect public conversation, positioning itself as the town square of the internet.

This thesis explores the design interventions to disrupt incidental news consumption and foster healthy discourse on social media platforms, particularly X (formerly Twitter). The literature review incorporates interdisciplinary elements, such as recommender systems, echo chambers, EU regulations, and democracy models, providing a comprehensive framework for the study. Insights from stakeholders, including politicians, non-profit organizations, and policy advisors, revealed overlooked aspects and guided the exploration of potential changes to the social media landscape. An in-depth analysis of X's features and issues informed the development of design proposals to introduce frictions in news consumption, aiming to increase exposure diversity and facilitate healthy online discourse. By analyzing qualitative data from stakeholder interviews, provotypes, and the user evaluation session, the research identifies challenges and opportunities in designing interventions.

This thesis provides design recommendations to introduce friction to incidental news consumption on social media and uncovers users' preferences and concerns about online discussion spaces which aim to foster healthy discourses. In the end, the thesis uses these design recommendations and redesigns the initial design proposals to be able to provide a concept and solidify the recommendations for the future research.

Finally, this thesis advocates for the introduction of frictions into endless social media feeds to bridge echo chambers and enhance the diversity of viewpoints encountered. In other words, this research demonstrates that social media experiences do not always need to be seamless. Thoughtfully introduced frictions can provide moments for reflection and encourage users to engage with a broader range of perspectives, ultimately supporting a more informed and democratic society.

This work represents an initial step towards a more reflective and informed social media experience, contributing to a healthier democracy and a better-informed public. While the thesis acknowledges that influencing regulatory change is a long-term endeavor, it hopes to go beyond the scope of the thesis and be an influence to the future regulation practices.

Reading Guide

This reading guide provides an overview of the thesis to assist readers in navigating to specific sections easily. Each chapter begins with a brief introduction on its cover page, followed by a detailed explanation of the topic and the research conducted.

The thesis is organized into two main phases: the research phase and the design phase. Visual cues are used to differentiate these two phases, making it easier for readers to follow the progression of the thesis. The guide aims to help readers easily locate the content they are looking for.

Visual Cues

Research phase color palette

Design phase color palette

Questions Questions emerged during the research

Quotes Participants' quotes during the sessions

Bold Text Bold text is used to emhasize key points

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CHAPTER 1

PROJECT CONTEXT

This chapter introduces the impact of social media personalization algorithms in shaping user content and highlights the issues of information isolation, such as filter bubbles and echo chambers. The chapter outlines the thesis's focus on exploring these phenomena, particularly on the X platform (formerly Twitter). It sets the stage for subsequent sections and research objectives aimed at fostering exposure to diverse viewpoints and healthy online discourse. This chapter includes:

1.1 Introduction
1.2 Problem Statement
1.3 Project Scope
1.4 Project Aim
1.5 Research Questions

1.1
Introduction

Social media transformed the mechanism of how we access and share vast amounts of information, consequently changing the ways we interact, debate and form opinions. (Flaxman et al., 2016 ; Del Vicario et al., 2016) According to the social media statistics from 2023, social media is used by 4.8 billion people worldwide, which accounts for 59.9% of the global population and 92.7% of everyone who uses the internet. (Nyst, 2023) (Figure 1)

Social media platforms have become predominant channels for information (Garg & Singh, 2022) with personalization algorithms significantly shaping the content we encounter, thus, have a big impact on society. (Kleanthous & Siklafidis, 2023) As social media platforms give users direct access to an extensive volume of content, altering the landscape of information spread from their original purpose of entertainment. (Cinelli et al., 2021) These platforms thrive on data, shaping personalized experiences. The content users see is determined by algorithms called recommender systems. These systems rely on three main signals: network, behavior, and demographics (Narayanan, 2023) to construct a user's feed.

On social media platforms, we encounter recommender systems frequently without knowing how much of our content is personalized and manipulated for various reasons. Notably, recommender systems play a significant role in shaping the promotion of content by considering users' preferences and attitudes. (Cinelli et al., 2021) In computer science, the algorithms powering social media are known as recommender systems (Narayanan, 2023). These systems are often referred to in the literature as personalization algorithms or personalized systems (Kleanthous & Siklafidis, 2023b; Eg et al., 2023).

This thesis uses these terms interchangeably. The potential effects of personalized systems in isolating online information are often described as filter bubbles (Bruns, 2019; Dahlgren, 2021; Zuiderveen Borgesius et al., 2016), echo chambers (Bruns, 2019; Geiβ et al., 2021; Spohr, 2017), and feedback loops (Dahlgren, 2021; Spohr, 2017). Although these terms overlap, they do not refer to identical phenomena (Eg et al., 2023). For example, Bruns (2019) describes echo chambers as resulting from preferential social media connections, whereas filter bubbles arise from preferential communications. Despite these nuances, both concepts share the common feature of information isolation and its impact on users (Eg et al., 2023). While some literature attempts to distinguish between echo chambers and filter bubbles, the distinction is often unclear (Plettenberg et al., 2020b).

This thesis uses these terms interchangeably, focusing on the shared aspect of information isolation and its effect on users.

1.2
Problem Statement

Social media timelines demonstrate that, due to personalized systems, users are increasingly exposed to content that aligns with their existing beliefs rather than challenging perspectives, leading to the formation of filter bubbles. Consequently, this phenomenon hinders their capacity to make well-informed decisions. (Chao et al., 2023) Online users tend to lean towards information that aligns with their existing worldviews while disregarding opposite perspectives, thereby forming polarized groups centered around shared narratives. (Cinelli et al., 2021)

When it comes to social media, younger individuals are more inclined than adults to rely on social media as a news source and exhibit trust in information coming from these platforms, indicating a generational gap in both news consumption habits and attitudes toward content on social media. (Choi et al., 2023) Younger individuals who have less interest in news often encounter news content incidentally on social media through personalized timelines, making them more likely to be impacted by this exposure. (Fletcher and Nielsen, 2017) Most scholars define incidental exposure as situations where "people inadvertently consume news and information [...] when they are not actively seeking it" (Kim et al., 2013b).

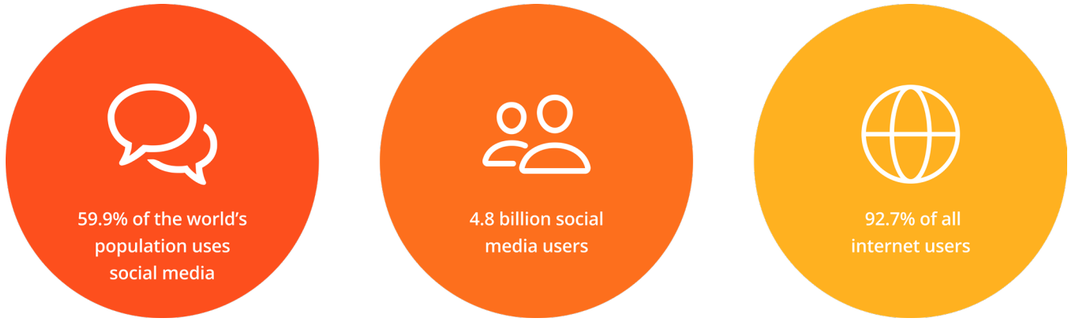


Figure 1. Visualisation of social media statistics from 2023

In conclusion, young adults tend to consume news and get information from social media, trusting the information coming from these sources. However, the information and news they encounter are influenced by personalized recommender systems that show content aligning with their existing beliefs and past interactions. This creates filtered views, limiting their exposure to diverse perspectives. This raises several questions:

How can we design social media platforms to encourage exposure to diverse viewpoints, especially for young adults?

In what ways can incidental news consumption be used to promote healthy discourse online?

1.3
Project Scope

This thesis explores the impact of social media personalization algorithms at the moment of incidental news consumption, considering the occurrence of echo chambers and its effects on both individuals and society. The research specifically focuses on the platform X (formerly Twitter), which is selected for its mission to promote and protect public conversation, positioning itself as the town square of the internet. (Twitter 2.0: Our Continued Commitment to the Public Conversation, n.d.) Despite this mission, Liu and Weber (2014) argue that Twitter's structure may undermine democratic discourse by encouraging users to interact primarily with like-minded individuals, thus reinforcing echo chambers.

The primary aim of this thesis is to design interventions that address the challenges posed by social media personalization systems, particularly for end-users of the X platform. These challenges include the tendency of algorithms to create echo chambers, which limit users' exposure to diverse perspectives and diminish opportunities for meaningful discourses online with diverse views. In addition to focusing on the end-users, this research considers the perspectives of key stakeholders such as policy advisors, politicians, and non-profit organizations. These stakeholders bring

valuable insights into the societal impact of echo chambers and the current regulatory framework. However, the central objective is to explore design interventions for users, particularly young adults who are likely to encounter news incidentally on their timelines and thus be impacted by being trapped in echo chambers with a limited worldview.

The research is inspired by design activism as its methodological approach for the exploration phase. This framework uses design as a tool to address and inspire change around societal issues, specifically in the context of incidental news consumption and its effects on users of X. The study will conclude with design recommendations aimed at increasing exposure to diverse viewpoints in social media news consumption and will also provide feedback to the stakeholders involved throughout the research process.

1.4
Project Aim

This project aims to increase young adults' exposure to diverse viewpoints in incidental news consumption on X (formerly Twitter), bring users with diverse viewpoints together and foster healthy discussions online.

1.5
Research Questions

RQ1. How can we increase the exposure to diverse viewpoints in incidental news consumption on X(formerly Twitter)?

RQ2. How can design interventions bring users with different viewpoints together on X?

RQ3. What would designed discussion spaces that bridge echo chambers to foster healthy discourse look like?

CHAPTER 2

THEORETICAL FOUNDATION

This chapter provides a theoretical foundation for understanding the impact of social media personalization systems, echo chambers, incidental news consumption, the regulatory landscape on digital interactions, and democracy models. By synthesizing these elements, the chapter establishes a comprehensive theoretical framework for addressing the challenges posed by social media personalization and echo chambers. It sets the stage for exploring design interventions that can mitigate these issues and improve the quality of online discourse. This chapter includes:

2.1
Social Media Personalisation Systems

Personalized recommender systems are a type of algorithm designed to learn from users' past preferences in order to predict their future interests. These systems provide tailored suggestions that match the users' tastes. The main goal of the recommendation algorithm in a personalized system is to accurately capture and represent users' interests. (Sonboli et al., 2021b) Recommendation algorithms rely on three main signals: network, behavior, and demographics (Narayanan, 2023), which collectively determine the content presented to users. Network refers to user interactions with others, including actions like follows, comments, and subscriptions. Behavioral data stands out as the most critical signal, relying on similarities between posts and individuals. Shared attributes, such as a hometown, hobby, or community increase the engagement with related posts among individuals. Demographics including characteristics such as age, gender, language, and geography, are particularly useful when a user initially joins the platform. However, their significance diminishes as users establish a behavioral footprint. (Narayanan, 2023) All of these factors determine the content that users see. When a recommender system on social media provides users with hyper-personalized information matching users' specific interests and preferences, while such a service may improve user experience, it may also limit users' exposure to diverse opinions. (Jeon et al., 2021)

2.2
Occurrence of Echo Chambers

An echo-chamber can be defined as where someone's political inclination, opinion, or belief on a particular subject is reinforced by frequent interactions with peers who have similar views. (Cinelli et al., 2020a) Users show the tendency to select information that adheres to their beliefs and join polarized groups formed around shared narratives. (Del Vicario et al., 2016, Garimella et al., 2018) Cinelli et al. (2020a) suggests a characterization of echo chambers rooted in the simultaneous presence of two key elements: (i) the polarization of opinions regarding a controversial issue, and (ii) the tendency for individuals to engage primarily with others who share similar views, known as homophilic interactions. This is often linked to a phenomenon known as selective exposure to information, which describes people's tendency to prefer information that aligns with their beliefs while avoiding information that conflicts with them. In other words, despite the vast array of information available on the Internet, people may not encounter a variety of viewpoints if they do not actively seek out information that challenges their current attitudes. (Liao & Fu, 2014)
It is crucial for users to recognize when they are within such narrow information pathways, enabling them to make informed decisions about whether to remain or take steps to break free. (Kleanthous & Siklafidis, 2023b) In a survey study conducted by Kleanthous and Siklafidis (2023b) involving users of tech-related online communities, participants appeared to be well aware that most of the platforms they use are governed by algorithms, resulting in users not seeing the same content online. According to Plettenberg et al. (2020c), a study on users' behavior and awareness of filter bubbles on social media, users who are aware of echo chambers appreciate a tool to help them avoid it. This indicates that existing technical solutions are either inadequate or not well-known to many users.

2.3
Incidental News Consumption on Social Media

Initially, none of the social media platforms were created with the aim of delivering news. However, as their user bases expanded and their features diversified, a significant portion of their users began perceiving and using them as a news source. There was noticeable diversity in this trend across different networks and countries. (Pew Research Centre, 2016 ; Newman et al., 2015)

Traditionally, achieving a well-rounded understanding of topics and arguments could be facilitated by (public) media and news outlets that adhere to regulations and ethical standards, particularly concerning the quality and diversity of content. (Helberger et al., 2015) However, especially young-adults rely on social media to access news (Walker et al., 2021) instead of using responsible public media sources. They also demonstrate a higher level of trust in information obtained through social media platforms (Liedke et al., 2022). Younger individuals who have less interest in news often encounter news content incidentally on social media through personalized timelines, making them more likely to be impacted by this exposure. (Fletcher and Nielsen, 2017) Since these feeds are customized by algorithms based on user behavior and demographics, younger people with minimal interest in news may be easily steered toward particular beliefs and viewpoints without critical examination. Furthermore, their view tends to be limited due to the constant exposure to similar views.

In the current media landscape, a significant portion of news is produced not by journalists but by various individuals and organizations (Ryfe, 2019). Therefore, the definition of 'news' should encompass more than just traditional media. By acknowledging this information, this thesis specifically focuses on traditional news sources as the primary source of news, aiming to remain connected to the information published by official organizations in X and the opinions and perspectives of users around that specific information.

2.4
Digital Services Act (DSA)

For many years, the European Union (EU) has been trying to implement a digital strategy aimed at creating a modern legal framework that safeguards online users' fundamental rights while also promoting business growth and access to new markets. (Turillazzi et al., 2023) On October 19, 2022, the Digital Services Act (DSA) was adopted, marking a significant step in the EU's efforts to enhance the regulation of online services. (Wilman, 2022) The DSA classifies platforms or search engines with over 45 million monthly users in the EU as very large online platforms (VLOPs) or very large online search engines (VLOSEs)(DSA: Very Large Online Platforms and Search Engines, 2024), which includes Big Tech companies like X(formerly Twitter).

Under the DSA, VLOPs are required to evaluate systemic risks associated with their services (Article 34) and take measures to mitigate these risks (Article 35). They must also disclose the main parameters of their recommender systems (Article 27), provide at least one option that doesn't rely on personal data profiling (Article 38), and avoid using dark patterns or manipulative design practices (Article 25). This implies that X should offer a non-personalized feed that is user-friendly and easy to use.

Governments are increasingly concerned about the negative impacts that Big Tech companies, especially social media platforms, can have on democracy. This concern is due to a lack of transparency in these companies' business models and operations, as well as their involvement in incidents of user

manipulation and the spread of fake news. Notable examples include the Cambridge Analytica case, where users' personal data was collected without their consent for use in political advertising. (Turillazzi et al., 2023)

The European Digital Rights (EDRi) network, which includes NGOs, experts, and advocates, has been defending online rights and freedoms for over two decades (European Digital Rights (EDRI), 2024) One of its members, the Panoptykon Foundation (Panoptykon Foundation, 2023) in Poland, focuses on ensuring that new technologies serve society and allows individuals to choose how they use them. They have published a position paper on user empowerment in recommender systems. (Prototyping User Empowerment: Towards DSA-compliant Recommender Systems | Panoptykon Foundation, n.d.)

The Panoptykon Foundation argues that implementing changes to mitigate systemic risks as defined by the DSA will likely face resistance from VLOPs, making independent recommendations essential. In 2023, a multidisciplinary group of researchers, civil society experts, technologists, and designers met to discuss user experience (UX) and interaction design features that could give users more control and choice over the content they see. They highlighted the need for designers to play a crucial role in translating the DSA into practical UX designs that will shape users' experiences on social media platforms.

While the Panoptykon Foundation's position paper highlights control and autonomy features in recommender systems, it doesn't fully delve into broader issues such as democracy, public debate, and incidental news consumption. This thesis acknowledges these efforts and sees it as an opportunity to explore how design can contribute to enhancing the quality of online discourses, and promote increased exposure to diverse perspectives through interventions in incidental news consumption.

2.5 Deliberative Democracy

While the filter bubble has been a concern for many, there are different answers to the question as to why filter bubbles are a problem for our democracy. There are different democracy theories and the threat of filter bubbles depends on one's understanding of the nature and value of democracy, on one's conception of democracy (Bozdag & Van Den Hoven, 2015b).

Deliberative democracy, often based on Habermas's (1989) concept of the public sphere, emphasizes the importance of diverse exposure not just for individual satisfaction but for fostering rational public debate and the development of well-informed public opinion. (Helberger et al., 2016) According to Habermas, deliberative democracy takes place in the public sphere—a communicative space that unites individuals from various backgrounds, allowing them to exchange information, share opinions, and engage in discourse. (Habermas & Burger, 1989)

Echo chambers within online communities can have implications for democracy and should be carefully considered and evaluated. (Erickson et al., 2023) In the deliberative perspective of democracy, echo chambers are perceived as problematic not because they hinder users from accessing desired content, but because they undermine the quality of public discourse (Bozdag & Van Den Hoven, 2015b). Exposure to diverse viewpoints is valuable in this perspective because it enables citizens to form more informed opinions and fosters less polarized, more tolerant attitudes towards those with differing views (Garrett & Stroud, 2014).

Deliberative democracy posits that users should have exposure to diverse viewpoints to uncover disagreements, truths, and various perspectives, thereby facilitating better decision-making. To enhance the epistemic quality of information, it's essential to increase the visibility of a wide range of opinions and perspectives on a given topic. This allows users to compare their own views with opposing viewpoints, promoting a richer understanding of the subject (Bozdag & Van Den Hoven, 2015b).

2.6 Design Interventions in the Literature

Helberger et al. (2016) argues that more advanced software designs aimed at giving users greater control are mainly discussed in academic research rather than implemented in current recommender systems. Consequently, intentionally accommodating different viewpoints in recommender system design has received less practical attention. Although a representative study conducted in the Netherlands, shows that while some of the population appreciated the benefits of increased personalization in news media, the majority valued being more broadly informed. (Helberger et al., 2016)* This section briefly examines the design interventions in the literature that focuses on deliberative democracy perspective which supports that individuals are, or should be, exposed to a variety of viewpoints, enabling them to identify disagreements, uncover truths, gain different perspectives, and ultimately make more informed decisions. (Bozdag & Van Den Hoven, 2015b)

*The survey was conducted among a representative sample of the Dutch population (n = 1400) and was part of the Personalized Communication Project (http://personalised- communication.net).

Design interventions examined in this section are selected due to their relevance with deliberative democracy perspective. These interventions are clustered and the categories are created based on the values they introduce:

1- Reflection on own and others' perspectives

a. ConsiderIt (Kriplean et al., 2012) encourages people to reflect on tradeoffs and others' perspectives. It enhances public deliberation by building on personal reflection and focusing on the tradeoffs of proposed actions and creating pro/con points. (Figure 2)

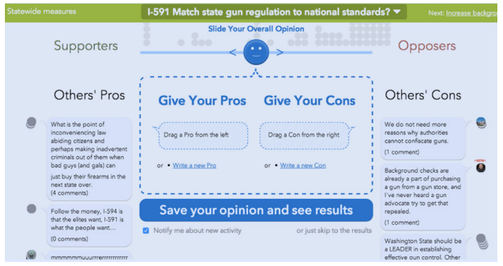


Figure 2. ConsiderIt

b. OpinionSpace(Faridani et al., 2010) maps individual web forum comments on a two-dimensional grid, based on responses to a brief value-based questionnaire. This allows readers to explore diverse comments and prepare to engage with perspectives different from their own. (Figure 3)

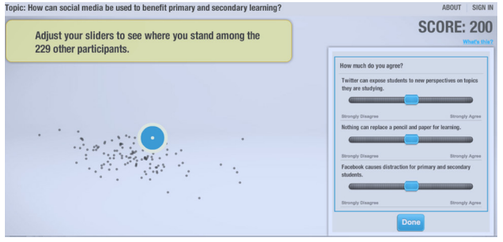


Figure 3. OpinionSpace

2- Discovery of diverse facts

c. NewsCube(Park et al., 2009) generates and delivers multiple categorized perspectives on news, enabling readers to uncover comprehensive facts. This helps readers in understanding news from multiple angles and forming their own balanced viewpoints, independent of specific biases.

d. CubeThat(Chhabra & Resnick, 2012) is a Chrome browser extension that shows suggested additional news articles related to the topic of the current news story. (Figure 4)

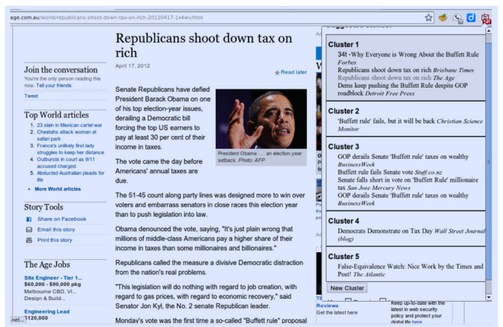


Figure 4. CubeThat

3- Encouraging listening and perspective taking

e. Reflect(Kriplean et al., 2011) modifies webpage comments to promote listening and understanding. It includes a listening box beside each comment, prompting users to briefly restate the commenter's points, even in disagreement. This nudges users to actively listen to others. (Figure 5)

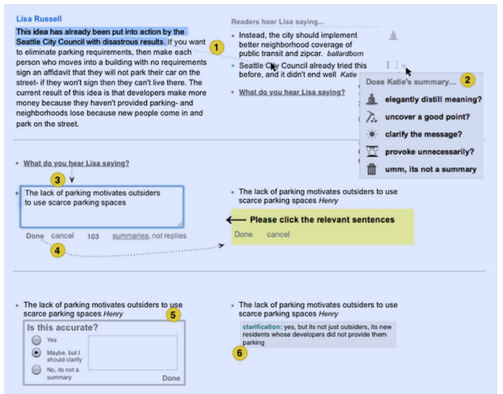


Figure 5. Reflect

2.6.1 Takeaways from the Design Literature

These design interventions in the literature are not specifically designed for X(Twitter), and even when they are, they are not designed to be part of the current X interface. These solutions were mainly designed as additional tools for intentional news consumption, where users actively seek out and engage with news content. In contrast, this thesis focuses on the current evolving interaction of incidental news consumption, where users encounter news unconsciously as they scroll through their feed. This raises the question:

How can we adapt and integrate these functionalities, or a selection of them, into X's existing interface to address incidental news consumption?

2.7 Building Bridges

Concerns about echo chambers suggest that diverse communities may reach a point where they no longer share common foundational beliefs, making their differences difficult to overcome (Nguyen, 2018). However, Erickson et al. (2023) conducted a study examining the similarities and disparities among opposing political groups. Their findings indicated that although various communities hold distinct perceptions regarding significant events and figures, the extent of these differences is less than one might think and these divisions may be bridgeable.

Designing these bridging spaces remains a significant challenge for researchers and practitioners, but prior research provides valuable guidance (Erickson et al., 2023). The literature highlights the importance of not only exposing users to diverse viewpoints but also creating online discussion spaces. Healthy and functional online discussions are more likely when norms of respectful conversation are established (Grönlund et al., 2015). Creating an environment that allows for disagreement and debate without fear of ostracism is essential for fostering healthy discussions (Coscia & Rossi, 2022; Grönlund et al., 2015; Nelimarkka et al., 2018).

This thesis aims to increase young adults' exposure to diverse viewpoints in incidental news consumption on X (formerly Twitter). It seeks to build bridges in between echo chambers, and promote a healthy discourse online.

2.8 Conclusions

As mentioned, this thesis explores the impact of social media personalization algorithms on incidental news consumption, focusing on the emergence of echo chambers and their effects on individuals and society.

Given the socio-technical roots of this topic, dividing the scope into macro and micro levels provides clarity. The macro level includes societal aspects such as regulations, democratic perspectives, involved stakeholders and the broader impact of echo chambers on society. The micro level examines user interactions and experiences within platforms during incidental news consumption, identifying potential areas for intervention. (Figure 6)

By positioning the macro level as a background research and focusing on micro level, this thesis aims to design interventions that mitigate the challenges posed by echo chambers and personalized algorithms in social media. The goal is to explore designerly approaches to disrupting the status quo in incidental news consumption and promoting exposure to diverse perspectives.

These three conclusions are drawn from the literature.

(1) Future research can focus on the interaction of incidental news exposure and designing interventions to mitigate its impact.

Although social media platforms were not originally designed for news delivery, many users now rely on them for news, especially younger individuals who trust these platforms (Walker et al., 2021; Liedke et al., 2022). Incidental exposure to news can lead to intentional news consumption, yet algorithm-driven feeds often narrow the range of viewpoints users encounter (Kim et al., 2013; Strauß et al., 2020). According to Plettenberg et al. (2020c), users who are aware of echo chambers appreciate a tool to help them avoid it. This indicates that existing technical solutions are either inadequate or not well-known to many users.

(2) Promoting spaces for online discourse and the exchange of ideas on digital platforms is crucial for the health of democracy.

Echo chambers within online communities pose significant challenges to democracy by degrading the quality of public discourse (Erickson et al., 2023). To strengthen democracy, it's essential to design systems that enhance the visibility of diverse perspectives, enabling richer, more inclusive public debates (Bozdag & Van Den Hoven, 2015b; Helberger et al., 2016).

(3) By conducting user research and developing interventions, it is aimed to generate preliminary insights that could serve as inspiration for future work that informs regulatory bodies.

The DSA is a crucial first step in the EU's efforts to regulate digital environments, with ongoing initiatives by organizations like EDRi (European Digital Rights (EDRI), 2024) continuing to build on this regulation. Building on the Panoptykon Foundation's position paper (Prototyping User Empowerment: Towards DSA-compliant Recommender Systems | Panoptykon Foundation, n.d.), this thesis will focus on creating UX interventions addressing broader issues of promoting increased exposure to diverse perspectives through interventions in incidental news consumption and enhancing the quality of online discourses.

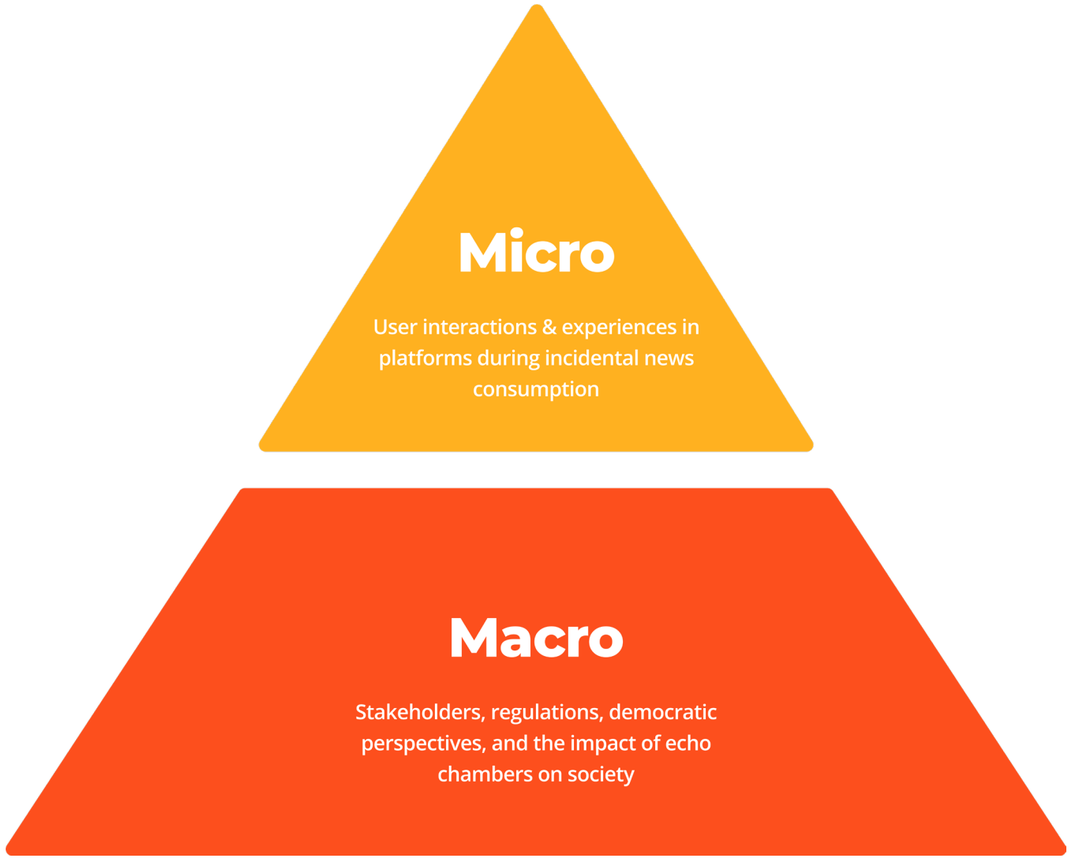


Figure 6. Levels of the scope

CHAPTER 3

DESIGN RESEARCH

This chapter explains the approach and methodology of this thesis, as well as the exploratory research phases based on the conclusions derived from the literature review. The research is structured into macro and micro levels to define a clear structure. The macro level delves into stakeholders' understandings and perceptions of echo chambers and their societal impact as well as their perceptions on current regulations, while the micro level focuses on end-users and their interactions during incidental news consumption. This dual approach serves a purpose of establishing common ground for solution exploration and identifying intervention areas. This chapter includes:

3.1
Approach & Methodology

This section introduces details how the research is guided by the principles of Research Through Design and Design Activism. These methods are applied to explore how design interventions can mitigate the impact of personalised feeds, which often limit users' exposure to diverse perspectives.

3.1.1 Research Through Design

Zimmerman (2003), states that design is inherently a form of research because both activities lead to the creation of new knowledge. Research through design involves engaging in design activities that contribute to the development of understanding and knowledge, through this process, design can reveal new combinations of factors, provoke discussions, and enable interactions that were previously impossible, thus making these interactions observable (Stappers & Giaccardi, 2014).

In this thesis, research through design is employed as a methodology, with the inspiration of design activism guiding the exploratory research to address the challenges of incidental news consumption.

3.1.2 Design Activism

Activism encompasses a wide range of actions and activities deliberately aimed at influencing democratic processes. From this perspective, democracy is regarded as the overarching process, with activism constituting the specific actions and activities taking place within that process. (Ricketts, 2012b) Design activism has the power to challenge and transform established systems of power and authority, creating opportunities to raise critical awareness about alternative ways of living, working, and consuming. (Markussen, 2013) Fuad-Luke (2013) emphasizes disruption as a key concept for understanding design activism's impact, explaining that activism aims to challenge and replace existing paradigms of shared meaning, values, and purpose with new ones. The design act is distinct from a boycott, strike, protest, or demonstration; rather, it offers a form of resistance through a uniquely designerly approach to intervening in people's lives. (Markussen, 2013)

This thesis is inspired by design activism to address the challenges of incidental news consumption on social media platforms. The goal is to disrupt users' routines of consuming news incidentally and counteract the effects of personalized algorithms that create filter bubbles and echo chambers. The aim is not only to disrupt existing interactions of incidental news consumption but also to create spaces and opportunities for users to engage with a variety of information. This approach seeks to cultivate well-informed individuals who participate in meaningful and constructive dialogues. By intervening in how users incidentally consume news online, this approach challenges the status quo and promotes a more informed and engaged society.

3.1.2.1 Power Mapping

Power mapping is a strategic tool employed by activists and organizers to identify and analyze key stakeholders, influencers, and decision-makers who can affect a specific issue or campaign. (Power Mapping | Activist Handbook, n.d.) Design activists should aim not only to address social needs or market demands but also to lead campaigns that inspire social and political change by considering the broader power structures involved (Fox et al., 2020). In this context, a power map is created to identify and engage with key power holders who can influence and facilitate change within the existing system. This mapping is considered helpful in the process to understand the dynamics of power and leverage relationships to drive meaningful changes.

The map features two axes: the Y axis represents power and influence, while the X axis illustrates alignment with the defined objective.(Left to right, strongly oppose to strongly agree) In this case, the objective is defined as creating possible solutions and regulating recommender systems to mitigate their negative impacts on society. (Figure 7)

Social media companies like X(formerly Twitter) are positioned on the left side, as they implement recommender systems to increase engagement and provide tailored experiences for users. While the engagement keeps users on the platform as long as possible and it makes the platform more profitable. On the other hand, governments, policymakers, political parties, ethicists, and non-profit organizations are placed on the powerful and supportive side, dealing with societal issues and policies. Academics are situated lower on the powerful spectrum, lacking direct involvement in regulatory matters. Lastly, users are placed at the bottom right, expressing support but possessing lesser influence due to limited awareness and understanding of echo chambers. Including myself on the map as a design researcher, being on the less powerful side highlighted my position in the ecosystem and showed the necessity of reaching out to power-holders.

Acknowledging that the power map was created to identify stakeholders for this research phase and recognizing that many

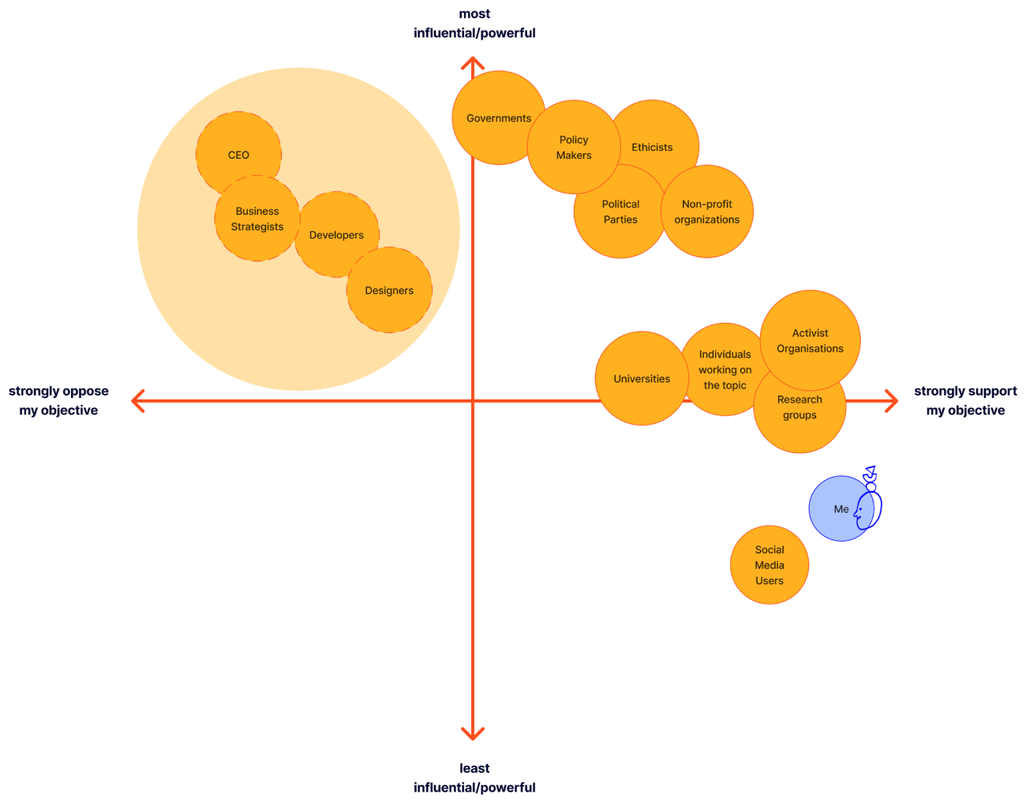


Figure 7. Power Mapping

factors and positions might change, it guided the next steps in reaching out to stakeholders.

As a result of the power map, the target group was identified as the power-holders situated on the right-hand side of the map—individuals likely to support regulations related to echo chambers. This group includes policymakers, politicians, non-profit organizations, and activist organizations, who were selected to be contacted and invited for interviews.

3.2 Macro Level: Exploratory Research

The macro level involves stakeholder interviews, engaging diverse stakeholders to uncover different layers of the problem space.

3.2.1 Stakeholder Interviews

Power Mapping revealed the significance of involving power-holders such as policymakers, politicians, non-profit organizations, and activist organizations. Drawing from insights gathered from the literature review, previous research in HCI has showcased the creation of user interfaces designed to present information from diverse perspectives(Jeon et al., 2021), with a primary focus on platform solutions and takes end-users as the main target group.

This exploration has sparked an interest in understanding the perspectives of power-holders such as policy advisors, politicians, non-profit organizations, and activist organizations regarding echo chambers and ongoing efforts to address them. Participants for interviews were selected based on these prior findings and the curiosity they sparked.

3.2.1.1 Participant Selection

This study aims to acquire a comprehensive understanding of various stakeholder viewpoints on echo chambers and incidental news consumption online. To gather domain-specific insights from stakeholders, semi-structured interviews are conducted to capture qualitative data. Five interviews were conducted, the participant details and discussion areas are provided in Table 1.

3.2.1.2 Data Collection

Before the interviews, participants were provided a consent form, which was signed and returned. Three interviews were conducted online via Zoom, while the other two were conducted in person. All interviews were recorded and transcribed using an automated transcription tool, with each interview lasting approximately 1 hour. Participant recruitment was conducted via email.

Given the diverse expertise and knowledge of the selected stakeholders in specific domains, each stakeholder interview contributes additional insights to the overall understanding of the issue. Consequently, interview questions were tailored slightly, depending on the stakeholder's expertise. Prior to each interview, goals were established and questions were adjusted accordingly. While the interview structure remained consistent, with changes made to expertise-related questions, the general outline was as follows:

1. **Introduction:** The interview started with introductory questions regarding the participant's expertise and background.
2. **Perspectives on Recommender Systems and Echo Chambers**: The second part focused on gathering the participant's opinions, perspectives, and thoughts on recommender systems and echo chambers.
3. **Domain-Specific Themes:** The third part was adjusted based on the participant's expertise, covering themes such as policy-making, the Digital Services Act, social change, and activism.

Participant Number	Stakeholder Group	Detailed Information	Discussion Areas
P1	Politician	Politician in a political party in the NL & AI Innovation Manager	Perspective of the status quo, reflection on power dynamics.
P2	PhD candidate working on EU regulations	PhD candidate focusing on content moderation, platform governance and regulation, DSA, Artificial Intelligence (AI) and socio-technical and legal system design	Regulations, digital services act(DSA), policy making processes.
P3	Non-profit organization	Communications & Community Manager at international non – profit organization that educates and connects young people who seek to become leaders on issues related to human and minority rights	Social impact, activist process, the importance of community and fellowships
P4	Policy Advisor	Policy advisor specialized on social media in an independent foundation influences policy and legislation to support an open and fair information society. They do this through advocacy, campaigning and legal action, in the Netherlands and Brussels	Social media related policy making and lobbying
P5	Social Media User	Social Media User (Student, 23)	Understanding of the status quo

Table 1. Interview Participants

4. Future Practice: The final part of the interviews centered on discussing potential future practices and approaches.

3.2.1.3 Data Analysis

After transcribing all five interviews, statement cards (Sanders & Stappers, 2013) were created to structure the data fragments and identify themes and patterns. The process involves extracting quotes from the transcripts, interpreting them, and paraphrasing them into statements that highlight their relevance to the research. This paraphrasing by the researcher facilitates the identification of patterns and clustering of data. The format of the statement cards, which presents the original quotes alongside the researcher-generated statements, simplifies the analysis and enhances the clarity of the findings. (Sanders & Stappers, 2013)

Given that the interview data were obtained from various stakeholders with diverse domain expertise, some clusters tend to encompass insights from multiple stakeholders, while others are specific to particular stakeholders. The statement cards are clustered multiple times to find patterns coming from different stakeholders. Additionally, reclustering the statement cards facilitated the identification of previously unseen patterns and insights from the interviews. A comprehensive data analysis is presented in Appendix C.

3.2.1.4 Insights

The interview analysis revealed patterns of stakeholders' perspectives regarding social media news consumption, Digital Services Act and impact of echo chambers on society. The most significant macro level insights drawn as follows:

1. Several stakeholders(P1, P2, P4) find the interventions to address social media news consumption and mitigate the impacts of echo chambers could be possible with actions from power-holders. Including systemic regulations, governmental initiatives, and platform policies. Individuals are not solely viewed as responsible for their actions.

2. Although stakeholders(P2, P4) view the chronological feed in the Digital Services Act (DSA) as a positive step, they express doubts about its effectiveness in addressing echo chambers due to users' lack of understanding about the necessity of using it and potential dark patterns in the implementation.

Micro level insights on social media news consumption and echo chambers include:

3. Several stakeholders(P1, P2, P3) find self-reflection valuable as a tool to prompt individuals to critically assess the news they encounter on social media and consider its impact.
4. The importance of building a community where individuals with diverse opinions can come together, cultivate mutual awareness, and engage in constructive dialogue has been emphasized. (P1, P3)
5. There is a need for users to develop an understanding of healthy practices in social media news consumption, the risks and dangers of echo chambers including how algorithms control people. Users lack information and awareness of the potential effects of personalized feeds on their news consumption habits. (P1, P2, P4, P5)

These insights will be further discussed in Section 3.4.

"I do read quite a lot of news actually on my Instagram." (P5)

"At the moment most of my news consumption comes from some feed." (P2)

3.3 Micro Level: Provotypes

The micro level centers on end-users and their experiences by utilizing research-through-design methods like provotypes, aiming to validate stakeholder insights and gather user perspectives. This phase focuses on both the initial insights based on the literature review and stakeholder interviews. While the interviews primarily centered on stakeholders and their perceptions, the need to understand the users' perspective became apparent during analysis. Provotypes were chosen as a method due to their positioning at the beginning of the design process, aiming to stimulate ideation at higher, more abstract levels. (Boer & Donovan, 2012).

To enhance the depth of the research phase before transitioning to the design phase, it was deemed necessary to incorporate an intermediate stage. Provotypes offer a gateway to conflicts within processes; these are artifacts or images that encapsulate tensions within a particular context, facilitating exploration of new design possibilities. (Boer & Donovan, 2012) There are three primary goals are set for the provotypes:

1. Explore users' perspective of personalized feeds
2. Explore ways of using self-reflection as a tool refer to this self reflection coming from the interviews
3. Discover users' acceptance to potential tools

These goals aim to address research questions related to understanding how users interact with personalized feeds, which is essential for identifying methods to increase exposure to diverse viewpoints in incidental news consumption. Based on insights from stakeholder interviews, the second goal explores potential approaches for self-reflection to encourage users to consider different viewpoints and engage in more meaningful interactions. Additionally, it focuses on understanding how users might accept and utilize tools designed to bridge echo chambers and foster healthy discourse.

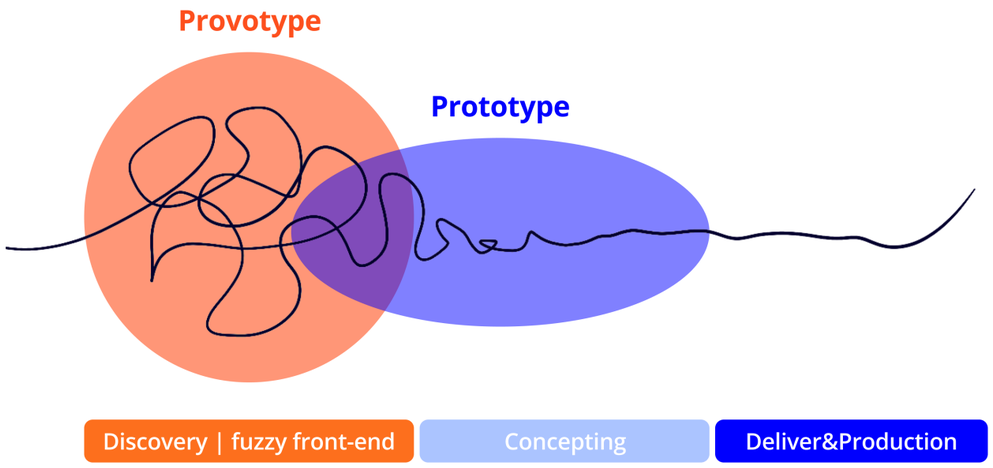


Figure 8. Visualization of the design phase in which the provotype and prototype are explained

3.3.1 Designing Provotypes

Two provotypes are designed based on the goals mentioned above. The provotypes, given in Figure 9 and Figure 10, are designed to resemble real-life solutions, serving as provocative tools to stimulate critical thinking about their potential use and the reasoning behind it. Each provotype is accompanied by a name and an image. Additionally, posters were created to highlight the added values of the solutions and what they offer. The first provotype is created to establish community involvement within the social media platform whereas the other one provides AI-driven information to users. Based on the goals mentioned above, it has been prioritized to keep the solutions distinct from each other: one involves human factors and values, while the other is an automated solution to consider users' perspectives. Advantages and limitations of human intervention versus providing AI-driven information in tackling echo chambers on social media platforms aimed to be discovered.

perspective

take care of your friends on social media.

Do it ~~yourself~~ together.

Algorithms may govern your feed, but you can make a difference. Join our community challenge to foster connection and build bridges between our diverse views.

In this challenge, you'll be assigned roles periodically to support your friends, while also experiencing their care in return. Your actions might include:

- Sending contrasting news views to your friends
- Implementing a temporary 2-hour social media ban for a friend who's spent too much time online, based on statistics.
- Changing your friends' feeds
- Exchanging feeds with your friends,
- Adding random content to your friends' feed,
- Temporarily restricting certain content

Figure 9. Provotype 1

DIVERSE AI

Diverse AI has been built by developers and designers who concern about the current way of social media. App will be available soon!

The aim of Diverse AI is to:

- Feeding you with **diverse views**
- Providing a list of **unseen categories and views**
- Providing insights about your **content exposure**
- Statistical analysis of **distribution of views** in the platform *(56% of the users sees this information)*
- Giving **personalised content recommendations**

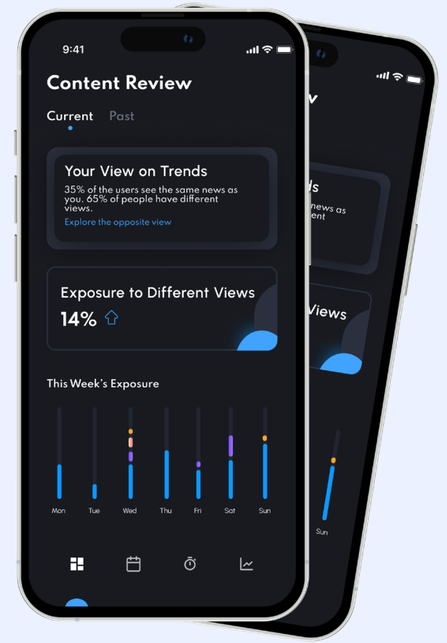


Figure 10. Provotype 2

3.3.2 Setting the Environment for Provotypes

It has been determined that conducting the provotypes in a participatory setting would foster a discussion environment, with the objective of gathering perspectives from young adult social media users regarding social media news consumption. The session included a movie screening(Figure 11), a following discussion, a warm-up activity, and the showcase of provotypes. The first step is a movie screening, chosen to provide information about the current situation and stimulate thinking in a relaxed setting. The movie selected for screening was "The Social Dilemma" (2020) due to its relevance and the activist mindset underlying it. This documentary features insights from technologists, activists, and scientists on the impact of social media on humanity, with the aim of raising awareness, providing information, and offering suggestions to users. Additionally, the movie's website encourages individuals to take action through various means and provides guides and materials for facilitators. One such action suggested was hosting a movie session, complete with a guide for facilitating the session and conversation. The movie screening is structured as the initial phase with the purpose of informing users and setting the stage for a natural discussion afterwards.

The discussion is facilitated in a semi structured way, guided by a provided framework. (The Social Dilemma, 2022) Following the discussion, a warm-up exercise is conducted based on the

social media scroll back method (Schubotz, 2020). This method involves the researcher and participant reviewing the participant's social media history. For the warm-up exercise, as an addition, participants are asked to label the types of content they encounter on their feeds, to promote critical reflection. After that, they are instructed to make a circle, switch their phones and view each other's feeds while continuing to label the content types. This exercise aimed to encourage participants to reflect on their own feeds and observe those of others. After completing the exercise, the session continued with the presentation of provotypes, with each provotype discussed individually. The outcomes are gathered through note taking during the session and analyzed by using statement cards (Sanders & Stappers, 2013).

3.3.3 Participant Selection

The session is promoted as a movie screening and discussion via posters posted on university WhatsApp groups. Eight individuals attended the movie screening and watched the film. Participants were given the option to leave before the discussion began. Six participants chose to stay for the discussion, all of whom were university students and active social media users.

3.3.4 Insights

The insights from the session were gathered through different phases. The most important insights are as follows:

1. The movie screening provided information to users and created consciousness at the moment, some participants expressed that they felt guilty to use their phone during the movie.
2. The session revealed that viewing other users' feeds prompted participants to compare and critically assess their own feed.
3. Participants expressed an interest to see random news content to broaden their awareness of topics beyond their usual interests.
4. While the first provotype (Figure 9) was initially perceived as fun, it was found ineffective in practical application as it shifted responsibility onto others. Users recognized the necessity for both themselves and their friends to be informed. Additionally, expressing reluctance to the requirement of extra effort.
5. Participants appreciated the second provotype (Figure 10) for its informative and automatic nature, seeing it as a chance to break out of their bubble. However, they expressed concerns about sharing data with another application and concerns about its AI involvement.

Figure 11. Movie Screening

These insights will be further discussed in the next section.

"I don't use any other source of news. When I just scroll my feed if the news comes to me, it's OK, I get it. If not, I don't care. If it's something really important and influential, I will double check it but otherwise I don't follow news pages." (University Student, Social Media User)

"I would like to change my content to something informative like those math videos or something like that." (University Student, Social Media User)

3.4 Triangulation & Discussion

The analysis of stakeholder interviews and provotypes is conducted separately, with the aim of eventually merging the findings and finding repeated patterns. Triangulation in qualitative research involves using various methods or data sources to achieve a comprehensive understanding of phenomena (Patton, 1999). It is also considered a strategy to validate findings by integrating information from diverse sources (Carter et al., 2014). In this chapter, the analysis from the research activities and literature will be integrated in a convergent manner.

Interview insights, along with their connections to the provotype insights, are presented below, with the additional insights from the literature. These insights will serve as core material for the design vision in the next stage.

1. Using self-reflection as a tool to provoke thinking about the consumed content.

During the interviews, stakeholders emphasized the importance of self-reflection as a tool for fostering critical assessment. Critical thinking, as defined by Ennis (2011), involves the ability to engage in reflective and independent thought, and to make autonomous decisions regarding actions and beliefs. To explore how self-reflection can be promoted, two approaches were tested in the provotypes session.

a. Providing Information

The first approach aimed to provoke self-reflection by providing users with information through two different methods. The first method used a movie to present information in a subtle and relaxed format. The second method employed an AI-driven external application to deliver statistical insights about users' data consumption habits through the second provotype. (Figure 10)

A study by Liao and Fu (2014) suggests that explicitly labeling viewpoints on social media platforms can enhance the pursuit of new and valuable information. Such labeling can serve as a "reminder" of diverse perspectives, thereby promoting diversity. To test this idea, the second provotype was designed to provide users with statistical data about their consumption habits. Participants expressed concerns about privacy and data sharing with the AI-driven application. However, they valued the insights it provided, particularly the visibility of previously unseen content and the distribution of their views (56% of users accessed this information). This suggests that users are receptive to receiving additional information and gaining new perspectives,

which can enhance their awareness of echo chambers.

In contrast, the movie as a more subtle information-providing tool made participants feel self-conscious about their phone use during the viewing. This approach effectively raised awareness and prompted users to reflect on their consumption behaviors at that moment.

b. Showing Unseen Content

The second method for provoking self-reflection involved showing users "unseen" content. Participants were exposed to each other's social media feeds during the session. This exposure prompted participants to reflect on the content they were seeing and consider alternative perspectives, increasing their awareness of other options available to them.

Both methods—providing information and showing unseen content—were effective at encouraging users to reflect on their behaviors. The key idea in these approaches is to disrupt users' interactions in order to make them more aware, leading to moments of critical thinking and self-reflection.

"I thought my instagram is balanced but seeing yours, I don't know." (University Student, Social Media User)

"I felt really guilty to scroll on my phone during the movie. As they said, it's just dopamine." (University Student, Social Media User)

"I like the list of unseen categories. You can escape from your comfort zone." (University Student, Social Media User)

"Providing content exposure data is cool so you can monitor yourself" (University Student, Social Media User)

2. Importance of a community that brings people together.

The first provotype was designed to explore the role of human interaction and community engagement on social media platforms in addressing echo chambers. Its focus was on supporting and assisting friends in breaking away from their echo chambers. While discussions revealed that the concept of community is highly valued, the practical implementation of this idea in the provotype often resulted in a sense of burden rather than fostering a genuine sense of community.

Literature emphasizes the importance of fostering a community that embraces diverse opinions and encourages respectful dialogue. Setting norms that promote open discussion, free from fear of exclusion or alienation, creating a space for discussions and disagreements is crucial for healthy online interactions (Grönlund et al., 2015; Coscia & Rossi, 2022; Nelimarkka et al., 2018). Designing such spaces holds a significance to bring people together, facilitate genuine dialogues and promote bridges in between echo chambers.

The insights suggest that communities designed to support shared responsibility without placing extra burdens on users should be explored. It is important to cultivate a community feeling that supports users without demanding additional effort from them to care for others. Future design should focus on creating community spaces that facilitate dialogue and support without creating a sense of obligation or burden for users.

3. Designed interventions should be communicated to power-holders to more effectively address echo chambers and provoke a change in the status quo.

Several stakeholders believe that actions from power-holders could be key to addressing social media news consumption and mitigating the impacts of echo chambers. In a study conducted by Gillani et al. (2018), a tool for visualizing social networks allowed a sample of Twitter users to explore the politically-engaged segments of their social network. The study found that some participants felt that mitigating ideological echo chambers should not be solely the responsibility of individuals. Instead, there is a need for a shared responsibility between political institutions and algorithmic curation on social media platforms. These insights highlight the importance of communicating designed interventions to stakeholders to demonstrate possible alternatives and inspire a change in the status quo.

CHAPTER 4

SHAPING THE DESIGN VISION

The design vision is shaped by the insights gained from the literature review, the research phase, and the triangulation of these insights. While the research phase provided insights on both macro and micro levels, it was necessary to revisit the project's aim and problem statement based on the gathered insights. The main aim is to increase young adults' exposure to diverse viewpoints during incidental news consumption on X (formerly Twitter) and to enhance the quality of online discourses. This chapter presents the current X features, debate examples to reflect the current user experience, essential components of the design vision, and design criteria.

4.1
Current X(Twitter) Features

X (formerly Twitter) aims to promote and protect public conversation, positioning itself as the town square of the internet . (Twitter 2.0: Our Continued Commitment to the Public Conversation, n.d.) X offers features like trends, communities, community notes, and spaces to bring people together. Examining these features and their pros and cons can provide insights for potential interventions to enhance diverse perspectives and improve the quality of discourses on social media.

Trends: Trends on X are displayed based on the topics users follow, their recent engagement, shared interests with other user groups, and their location. Users can decide to view non-

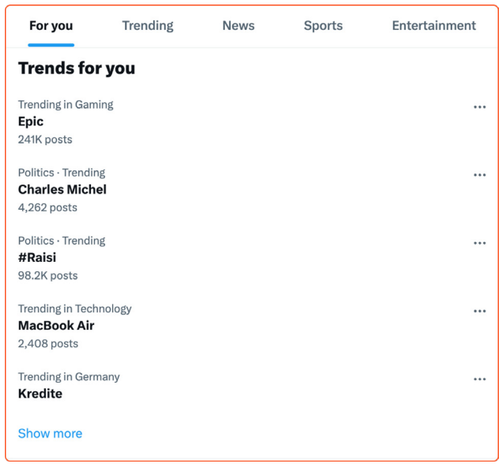


Figure 12. Trends

tailored trends by selecting the Trending tab in the Explore setting. These trends highlight popular topics within specific geographic regions. (Trends Recommendations, n.d.) (Figure 12)

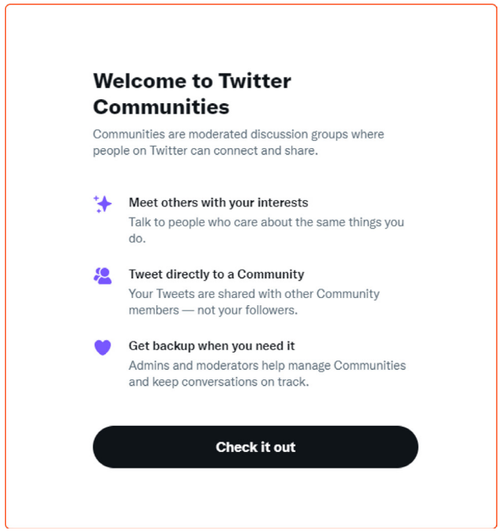


Figure 13. Communities

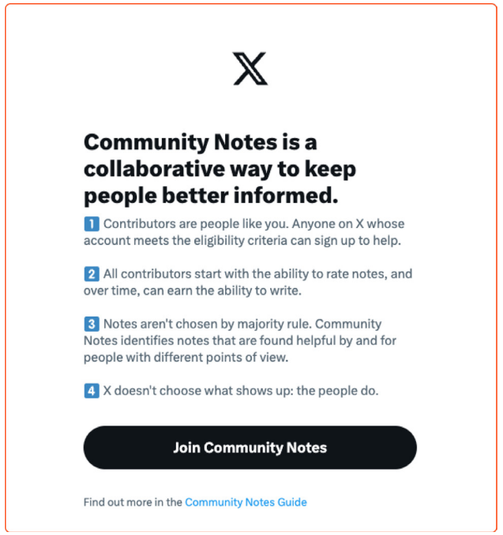


Figure 14. Community Notes

Communities: Communities are moderated groups on X where users can connect others with their interests and share discussions. (Join a Community on X | X Help, 2023) (Figure 13)

Community Notes: Community Notes aims to create a more informed user base by enabling users to collaboratively add context to posts that might be misleading. Contributors can leave notes on any post, and if enough contributors from diverse viewpoints find the

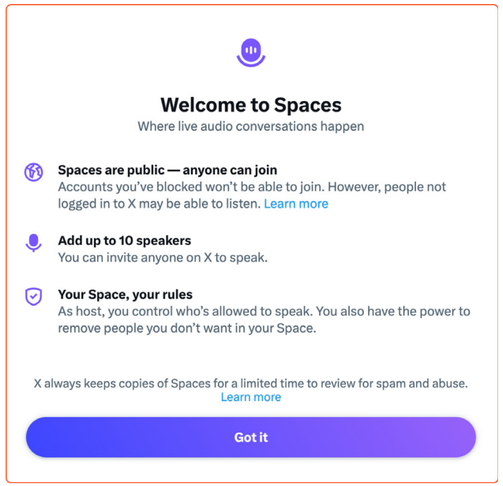


Figure 15. Spaces

note helpful, it will be displayed publicly on the post. (About Community Notes on X | X Help, 2023) (Figure 14)

Spaces: Spaces offer a platform for live audio conversations on X. Anyone can join as a listener, and hosts can invite up to 10 speakers to their session and set the rules for the conversation. (About X Spaces, 2023) (Figure 15)

These features offer different formats for user interaction, such as audio and text, and provide opportunities to create discussion environments. However, the quality of the discussions and debates remains questionable. The next section will examine current debates in terms of exposure to diverse perspectives and constructive dialogue.

4.2
Examining Current Discussions in X

As this thesis primarily focuses on traditional news organizations, this section explores debates within current news publications on X. This analysis involves reviewing published news articles and the discussions in the comments sections. News articles were identified through traditional news profiles, and only those with comments were examined. Figure 16 is provided as an example to illustrate current cases, more examples can be found

Figure 16. Discussion on the Comments Section

in Appendix F. The analysis revealed that, although some opposing views are expressed in the comments, the predominant format tends to be opinion statements rather than fostering a genuine discussion and debate. Often, individuals express their opinions very strongly and respond to others sarcastically, which hinders constructive dialogue. (Figure 16).

4.3
Design Vision

The essential components of the design vision focuses on the moment of incidental news exposure, increasing the exposure to diverse news perspectives and encouraging users to engage in constructive discussions. (Figure 17)

Incidental news exposure on social media is often unintentional and characterized by brief and fragmented reading habits. According to the research from Boczkowski et al. (2018), interviewees report that they typically pay attention only to headlines, images, and lead paragraphs. To address this brief moment of exposure, the design vision aims to disrupt users' routine behaviors by introducing friction and creating opportunities for reflection. Increasing the engagement with the content could be a way to achieve this approach.

Exposure to diverse viewpoints is the initial step toward a healthy democracy, but it must be followed by meaningful discussion and engagement. Masip et al. (2020) emphasize that such engagement fosters understanding and dialogue across differing opinions, essential for democratic discourse. Habermas (1989) describes this as the essence of deliberative democracy, where the public sphere facilitates communication, information exchange, and discussion among diverse groups.

In summary, the design vision seeks to disrupt the brief moments of incidental news exposure and provoke them to seek diverse views. Once it is achieved, the vision aims to promote constructive discussion between users with diverse opinions. This approach should be integrated into the current social media interface to address privacy and transparency concerns associated with external applications.

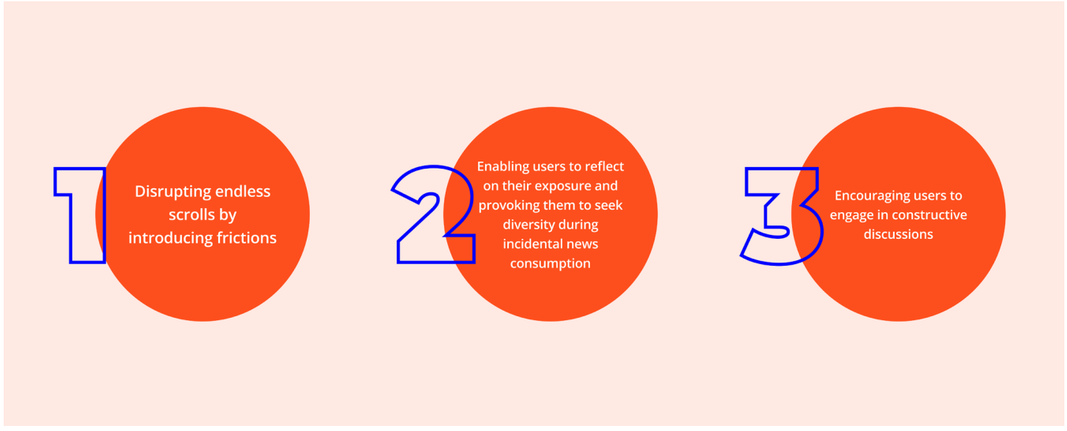


Figure 17. Stages of Design Vision

4.4
Design Criteria

Design criteria is defined to provide a clear framework and set of guidelines to make sure that the design intervention meets the desired goals and objectives. Design vision and criteria is followed for the creation of design interventions.

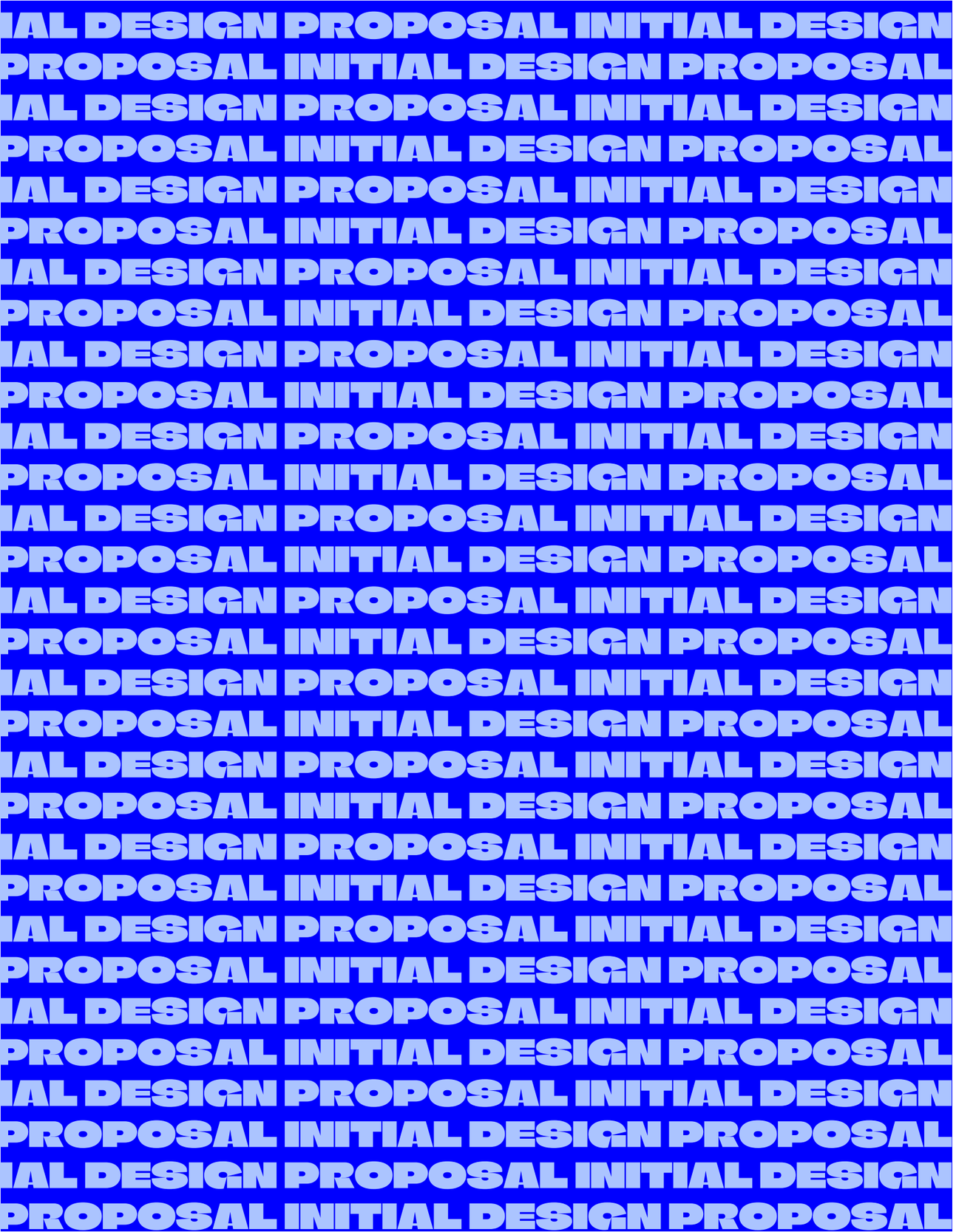
Disrupt incidental exposure
(1) Design frictions to disrupt the brief moment of news consumption and nudge users to explore diverse perspectives.

Community space
(2) Establish a dedicated community space for discussions, debates, and access to resources related to news content.

Increase exposure to diverse perspectives
(3) Ensure presentation of news from opposite viewpoints
(4) Ensure a range of perspectives and opinions represented

Promote constructive discussion
(5) Encouraging users to participate in constructive discussions.

Integration with the current interface
(6) Integrating new features to the existing X(Twitter) interface
(7) Maintain user-friendly design, making new elements easy to navigate and understand.



CHAPTER 5

INITIAL DESIGN PROPOSAL

This chapter presents the initial design proposal, titled “Diverse Perspectives Hub.” With the design vision and criteria already established, the development of design proposal was guided by this framework and enriched by additional elements from the literature, such as nudging methods and designing frictions. The proposal consists of three main components: a landing page, frictions to disrupt incidental exposure, and a dedicated community space for online discourse. This chapter includes the following sections:

5.1
Landing Page

The aim of creating a landing page is to communicate the new feature, its values, and give ideas about how the product would look like. The design includes the X logo and begins with a header that explains the main purpose of the product, highlighting the benefits for X users in fostering a well-informed society. The next section aims to engage users by presenting two different perspectives of the same news story, demonstrating the contrast between what users see on their feed and a contrary perspective.

Following this, the landing page outlines the feature's values, explains how it works, and includes user testimonials. Call to Action (CTA) buttons are placed to direct users to the main product. For prototype purposes, CTA buttons are present but not linked to the following screens. Both desktop and mobile versions of the landing page have been designed. The interactive prototype can be found in Appendix G. (Figure 18)

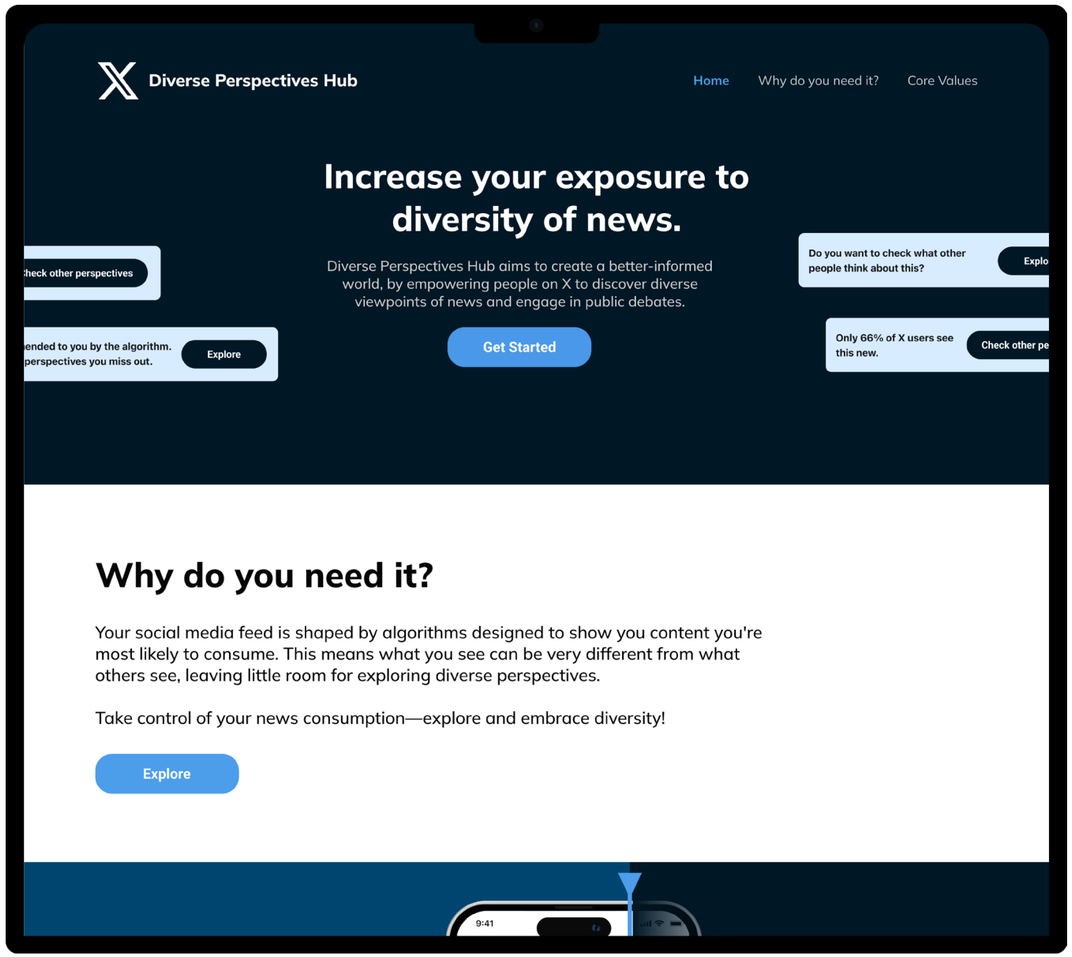


Figure 18. Landing Page

5.2
Disrupting Incidental Exposure

Since the scope of this research addresses incidental news consumption on X, and incidental news consumption occurs very briefly (Boczkowski et al., 2018), disrupting this moment and fostering mindful interactions has been seen as an opportunity. Given that incidental news consumption has a greater impact on younger individuals due to their reduced interest in consuming news (Fletcher & Nielsen, 2017), transforming this brief moment into a more mindful interaction can enhance the user experience. Cox et al. (2016c) argues that introducing small frictions into interactions can sometimes improve everyday technology use. Design frictions can interrupt "mindless" interactions, encouraging moments of reflection and fostering more "mindful" engagement.

A microboundary is an intervention that introduces a small obstacle before an interaction, preventing users from quickly transitioning from one context to another. This brief interruption creates a moment for users to reflect on their actions (Cox et al., 2016c). By designing such frictions, it is possible to disrupt unconscious interactions and guide users toward more mindful engagements, employing nudging as a technique. Nudging aims to influence people's choices by leveraging specific psychological effects or counteracting automatic decision-making tendencies (Mirsch et al., 2017b). As many decisions are now made on screens, the concept of nudging has become increasingly relevant in the digital world (Mirsch et al., 2017b). Users often make quick, automatic decisions without processing all necessary details (Weinmann et al., 2015). Therefore, it is crucial to define the type of nudge being used and to be transparent about it. The interventions designed in this research fall into the category of transparent Type 2 nudges (Hansen & Jespersen, 2013a), which guide users to change their behavior predictably while preserving their freedom to choose differently. This category of nudges is known as 'empowerment' nudges, which aim to support transparent and reflective decision-making in users' best interests without adding extra regulations or incentives (Hansen & Jespersen, 2013a).

Based on a systematic literature review by Mirsch et al. (2017), which identifies and explains twenty psychological effects associated with nudges, four relevant psychological effects and related nudging techniques were selected and applied to the design interventions. These interventions are designed to address incidental news exposure from traditional news sources and to nudge users towards exploring diverse perspectives.

5.2.1 Framing

Framing involves presenting a decision problem in a specific way to shape how it is perceived and interpreted (Mirsch et al., 2017b). In this intervention, framing is used to highlight that the consumed content is the result of an algorithm's decision, introducing a friction by displaying a loading icon to slow down users before they consume the content immediately. (Figure 19)

5.2.2 Priming

Priming prepares individuals for a decision by subtly guiding them toward it (Mirsch et al., 2017b). For instance, asking questions like "Do you plan to vote?" or "Do you plan to vaccinate your child?" before a decision-making moment (Sunstein, 2019). In this design intervention, priming is employed by placing a contrasting prompt over the news to attract attention, asking, "Do you want to check what other people think about this news?" before allowing users to read the news and preparing them for the decision. (Figure 20)

Figure 19. Framing

5.2.3 Social Norms

Social norms come from our interactions with others and can be unspoken, with any consequences managed by social networks rather than legal authorities. (Cialdini & Trost, 1998) People usually look at others' behavior for guidance on how to act in uncertain situations. (Mirsch et al., 2017b) This intervention emphasizes that there is a crowd engaging in an open debate, aiming to show users what others are doing and nudging them to participate. The intervention is placed on top of the news to create contrast and attract attention of the users. (Figure 20)

5.2.4 Loss Aversion

The concept of loss aversion in psychology indicates that people tend to be more influenced by potential losses and disadvantages than by equivalent gains and benefits. (Kahneman et al., 1991) Phrases like "8 people are looking right now" or "In high demand!" are used to convey information about popularity or limitation, triggering this principle. (Mirsch et al., 2017b)
The intervention provides statistical data highlighting that the majority views an opposing perspective, and creates a friction where users must first read this information first. After revealing the perspective, the design enables them to discover what they might have missed. (Figure 21)

It is important to note that there are no clear boundaries between these types of nudges, and one type can overlap with others. These types are selected due to the relevancy with the context and designed as alternatives aiming to explore users' preferences, concerns and the impact of different nudging techniques. The interactive prototypes can be found in Appendix H.

Figure 20. Priming(Left), Social Norms(Right)

Figure 21. Loss aversion

5.3 Dedicated Discussion Space

After introducing frictions and nudges during users' incidental news consumption, the next step was to direct them to a dedicated space where they could explore diverse news perspectives and opinions on these stories.

This space is designed to foster a sense of community, with established community rules. When users click on any of the call-to-action buttons from the previous section, they are guided to this designated area. Here, users first review the community rules before accessing official perspectives from various news organizations on the same topic. This space is structured to bring users together under the articles to facilitate a healthy discussion environment, encouraging interaction through upvote and downvote buttons that reflect their support or disagreement with different perspectives. (Figure 22)

Design interventions of the discussion space is intentionally kept simple, positioning the design as a conversation starter.

It is aimed to focus on creating a discussion environment to gather users' expectations, concerns, and recommendations.

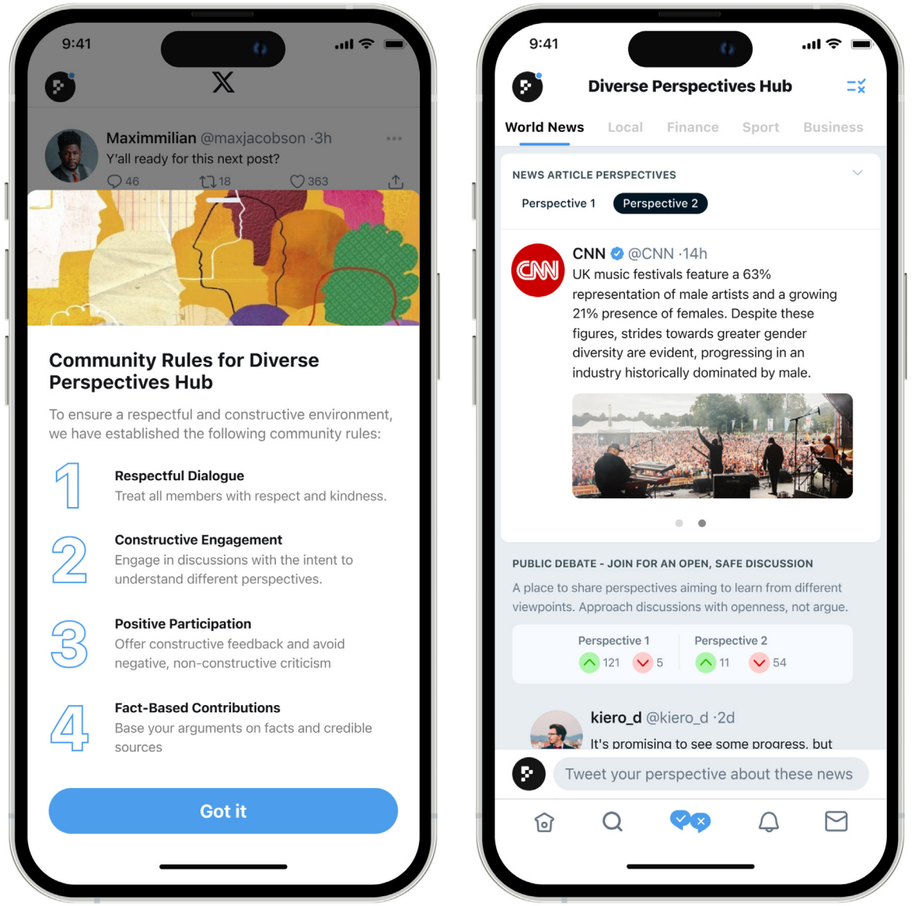


Figure 22. Dedicated discussion space

CHAPTER 6

USER EVALUATION

This chapter presents the user evaluation process, focusing on the utilization of focus groups to assess and refine the design alternatives. By employing focus groups, it is aimed to gain a deeper understanding of user preferences, concerns, and suggestions for improving the design interventions. The feedback collected through these sessions will be used in defining design recommendations and redesigning alternative proposals to better promote diverse perspectives and healthier online discussions.This chapter includes:

6.1
Method

Focus group was selected for this study to facilitate discussions aimed at evaluating and improving the design alternatives. Massey (2011) highlights that focus groups are effective for gathering diverse data from participants, particularly in social contexts where a variety of perspectives can be explored. Additionally, Mazza (2006) demonstrates that focus groups are well-suited for evaluating visual elements of design by providing insightful feedback and identifying potential issues. Unlike individual feedback methods, focus groups are designed to foster discussion and idea-sharing among participants (Kitzinger & Barbour, 2001).

This method is selected to explore users' reactions to visual and interactive design interventions in a collaborative setting. The method is particularly relevant as the interventions designed to promote an increased quality in online discourse, discussing this feature in a group setting would bring valuable insights and address different perspectives.

6.2
Participant Selection

The focus group session was announced through posters shared on university WhatsApp groups. The poster featured a persona with the statement, "I read news when it comes to me on X, but I don't actively search for it." Participants who matched this persona and were regular users of X were recruited. The session is conducted with six participants.

6.3
Data Collection

Participants were provided a consent form, which was signed and returned before the start of the session. The session was conducted in person in a round table setting, lasting approximately 1 hour and 30 minutes. Interactive prototypes are created using Figma and accompanied QR codes are prepared in advance. Participants scanned the QR codes with their own phones to interact with the design proposals. The session was recorded and transcribed using an automated transcription tool.

The purpose of the focus group was to gather feedback and insights about the 'Diverse Perspectives Hub' and to explore users' perceptions of this feature. Specifically, the focus group aimed to address the following questions:

What if we introduce frictions during incidental news consumption to encourage users to explore diverse views?

How can we promote healthy discourse online? What would be the effective ways of doing it?

The focus group was structured around a pre-prepared outline and accompanying materials. The session was organized as follows:

1. Introduction: The purpose of the focus group is explained, background of the project is provided, and the session's agenda is shared.

2. Testing: This part of the session was divided into three phases:

Landing Page: Participants were asked to scan the QR code to access the landing page. After scrolling through the page, they wrote their feedback via post-it notes, followed by an open discussion to capture their initial impressions of the feature.

Disrupting Incidental Exposure: Participants interacted with four design alternatives on the X feed, presented in a randomized order. To ensure a balanced evaluation, each participant experienced the alternatives in different orders. After exploring the alternatives, participants were asked to write their feedback on post-it notes and assign them to the corresponding design. The designs were printed out to provide a tangible and visual reference for the discussion. (Figure 23) Participants reflected on their interactions with the call-to-action buttons, noting whether they clicked or did not click the buttons, and their feedback was based on the state of the buttons. An open discussion was held regarding exploring their opinions on the design alternatives.

Dedicated Discussion Space: Participants scanned a QR code to access the dedicated space. As in the previous phase, they wrote their feedback on post-it notes and participated in a discussion about their experiences.

3. Feedback and Reflection: Participants provided overall feedback on the session and offered recommendations during a discussion.

6.4
Data Analysis

After transcribing the session, statement cards (Sanders & Stappers, 2013) were created. The analysis is divided into two categories based on the focus group outline, as the study was conducted around different design proposals and discussions. These two categories are created to gain both general and design-specific insights.

First, the Overall Analysis clusters all statement cards according to common patterns. Second, the Intervention-Based Analysis focuses on design-related insights specific to the interventions, guiding the redesign proposals. This two-fold analysis offered a comprehensive

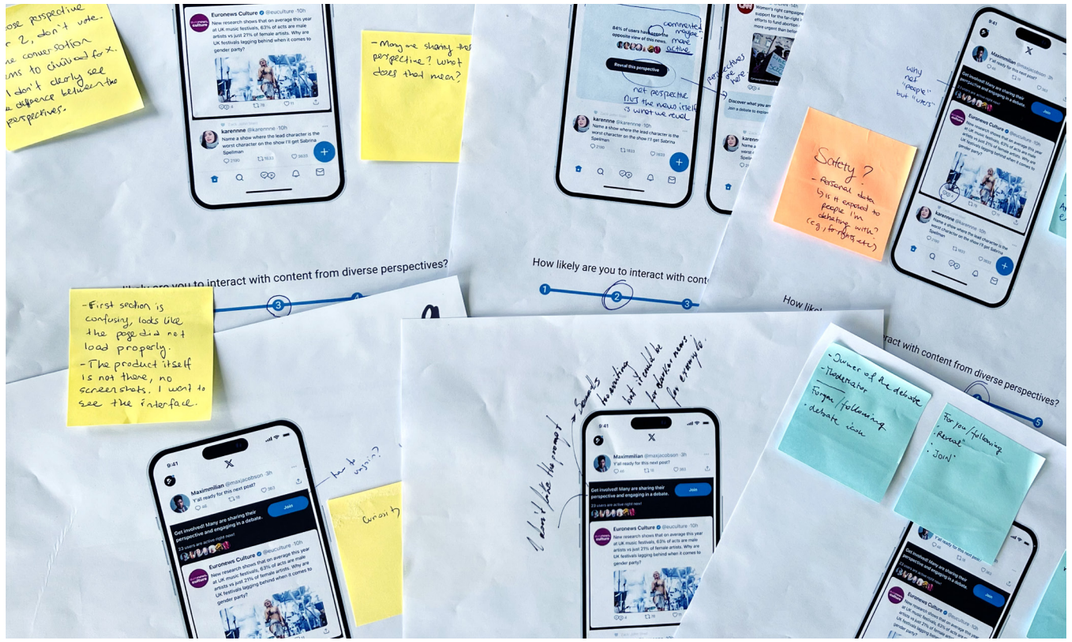


Figure 23. Handouts and feedback on alternatives

view of users' concerns and preferences, as well as design-specific insights about the proposals. A detailed version of the data analysis is presented in Appendix I.

6.5 Insights

The insights are divided into two categories: Overall Insights and Intervention-Based Insights. The detailed insights are provided below.

6.5.1 Overall Insights of the Session

The overall analysis of the session examines the insights from a holistic perspective, clustering all statement cards according to common patterns. Clustered statement cards provided insights into five main categories. These categories and relevant insights are explained below. A detailed version of the data analysis is presented in Appendix I.

6.5.1.1 Clarity of Terms

There has been confusion about the definitions of terms such as "others" and "perspectives." Participants questioned who "others" referred to, noting that it could vary depending on the type of news. They also questioned how these "others" are defined and clustered. Additionally, they asked for clarity on the meaning of "perspectives"—whether it referred to news perspectives or people's perspectives. Participants questioned how these perspectives are defined, whether they are sharply summarized, and what happens if there are more than two perspectives or none at all. They also mentioned that not all news is worth discussing, as sometimes there is a consensus.

"Others are the people who consume a different content? Geographically different than me?"

6.5.1.2 Expectations from Disruptions

Participants emphasized that they want to see statistical information or the number of people involved. They felt that knowing how many people had seen the news or engaged in a discussion would give them an incentive to join or take the discussion more seriously, especially if it reached a large audience.

One participant mentioned she expects a seamless experience and doesn't want to see nudges after a while. The group supported this, agreeing that nudges should disappear as users become comfortable navigating the discussion space.

Another participant expressed a desire for autonomy to correct the algorithm's suggestions.

"Sometimes, when I reference a tweet, I assume everyone knows what I'm talking about. However, I often realize they don't understand my reference because they haven't seen the tweet."

"I like getting information about the number of/statistics of people who have seen this news."

"I see this as a one month trial to engage more users. But then I think this has to disappear. Then I'm comfortable going to the other space because I want to go there."

6.5.1.3 Expectations from the Discussion Space

Participants emphasized the need for a question or statement in the news to form an opinion, as not all news presents a perspective. When there are perspectives in the news, they want to see the perspectives clearly displayed. Participants also expected to see a glimpse of ongoing discussions and suggested showing summarizing statements of the news perspectives because of its convenience. They mentioned that directing a question or writing a statement about the news would nudge them to form an opinion. One of the participants wanted the option to add new perspectives or cluster existing ones in the discussion space. The same participant suggested implementing an AI bot to scan news and categorize them into perspectives. Additionally, participants mentioned the need for a moderator to start discussions, prevent conflicts, and cluster perspectives.

Initially, the design focused on "public debate", but participants suggested that "hearing voices" might be a better term, as it emphasizes bringing diverse views together and fostering healthy discourse rather than reaching a consensus or defining right and wrong sides.

Participants mentioned that the success of this feature depends on the user type. Four participants identified themselves as "passive" users who read many tweets but do not post. They were unsure if they would be willing to join the debate.

"I'm a passive user of X, I love to read, I spend time on Twitter because I love to read other people but I don't post."

6.5.1.4 Participants' Concerns

Participants expressed concerns about transparency, data tracking, and privacy. They were worried about their names and personal data being linked to discussions. They only wanted to interact with verified accounts to avoid bots and fake accounts. Participants questioned if the discussions they joined would be attached to their accounts and if the algorithm would link discussions to their profiles.

They also expressed concerns about why X exposes them to certain news sources more than others. They questioned whether there is a bias towards specific news organizations, who might be funding this increased exposure, and the reasons behind it.

"Twitter is exposing more to this kind of news and these kinds of sources. Who is paying for this?"

One participant raised concerns about the potential impact on news organizations, with three others supporting this concern at different points in the conversation. They worried that news sources might adopt a more neutral strategy to avoid being involved in debates, potentially altering the nature of news reporting. Additionally, news organizations might not want to be associated with specific perspectives.

Moreover, participants questioned if this feature fits to the nature of X. As they are all regular users, they mentioned that people in X are very toxic and the idea of a healthy discourse in X did not seem realistic to them.

"I think the conversation is too civilized for Twitter, it doesn't have any tension! It's like discussing with ChatGPT. "

"In the comment section we fight. So in this section, how do we come to terms to just see each other's views and not agree on something at all?"

6.5.1.5 Implementation to X

Participants recommended that instead of offering this design proposal as a new feature, it could be blended with already existing features such as Communities or Spaces. While two of the participants expressed excitement towards the implementation of this feature, one of them mentioned that he would be scared to see it implemented due to the nature of X.

"I'd be scared to see it implemented. People in X are very toxic. I feel like it would get out of hand very quickly."

6.5.1.6 Impact of the Proposal

Participants discussed that the design proposals increased the awareness of the content they see and encouraged them to reconsider the news content they consume. In this study, the design proposals served as a research object, with all aspects thoroughly discussed, criticized and feedback provided to improve the interaction.

Participants also noted that they interacted with all the nudges out of curiosity, as it was their first time encountering this feature.

"It brings more awareness to see that the news I follow has a view and there are perspectives I don't follow. I am more aware that what I see can be limited."

6.5.2 Intervention-Based Insights

The user evaluation insights are divided into three parts, corresponding to the three main elements of the design. Each element was discussed separately during the evaluation, building on the previous discussions. The insights cover the design proposals for the landing page, disrupting incidental news exposure, and the dedicated discussion space. This structured approach ensures a comprehensive understanding of how users perceive and interact with each aspect of the design.

6.5.2.1 Landing Page

- One of the participants mentioned that he wanted to see the integration of this feature with the X feed to get a clear picture.
- Participants mentioned that proposed values of the feature stayed general and it was difficult to understand the value of this feature proposing as an addition to X.

6.5.2.2 Disrupting Incidental News Exposure

This section includes four different design alternatives and the insights gathered from user evaluations. Each alternative employs a distinct nudging strategy to introduce frictions into incidental news exposure. The insights highlight user expectations, concerns, and preferences, offering feedback for the redesign phase. The design proposals are presented through images, with relevant insights highlighted on the visuals with numbers.

6.5.2.2.1 Framing

1. There was confusion among users about whether the algorithm was rephrasing news, displaying different content from the same source, or finding news within that source, indicating a lack of clarity in its functionality.

2. One of the participants mentioned that showing the news organization during loading gives the impression that the content will always be from the same source.

3. Another participant expressed fear about waiting for an algorithm to decide the content, indicating a discomfort with this process.

"This kind of made me afraid. Although maybe this news consumption works with the algorithm in the first place, like always, waiting for it to do that... I was concerned."

4. Participants were unclear about the meaning of "support", whether it means supporting the organization or the news content as well as it is not applicable for any type of news.

"We don't support the news if there are no statements made there."

5. Participants preferred to see the alternative perspective before clicking on it to view the discussion.

6. One of the participants asked for the ability to interact with the algorithm, such as by rejecting or correcting its suggestions.

7. While the surprise element is appreciated, one of the participants questioned if it differs from simply refreshing the Twitter feed, as the algorithm will provide new tweets anyway.

8. Another participant mentioned that the design allows you to rethink the content you consume.

6.5.2.2.2 Priming

1. One of the participants mentioned that "other people" only refers to people and he would only expect to see people's opinions.

2. Participants mentioned that seeing a number of people engaged would be nice to give an idea about the visibility and the reach of the news.

3. Participants mentioned that "explore" communicates you can observe without actively joining and they would be inclined to click it.

Figure 24. Insights on Framing design alternative

4. Participants asked for clarity about the difference between the comment section and where they will be guided when they click on it.

6.5.2.2.3 Social Norms

1. One of the participants mentioned that the value proposition of "many are sharing opinions" is unclear as it is already the nature of X.

2. Participants associated the term "join" with active participation and expressed their hesitation to click.

3. The use of cross and check marks implies that there are right and wrong opinions.

6.5.2.2.4 Loss Aversion

1. Users found the design frustrating, mentioning it gives the impression of a paid subscription.

2. Participants questioned whether "have seen" effectively conveys people's views since it is a passive action, also questioning the feasibility of this feature.

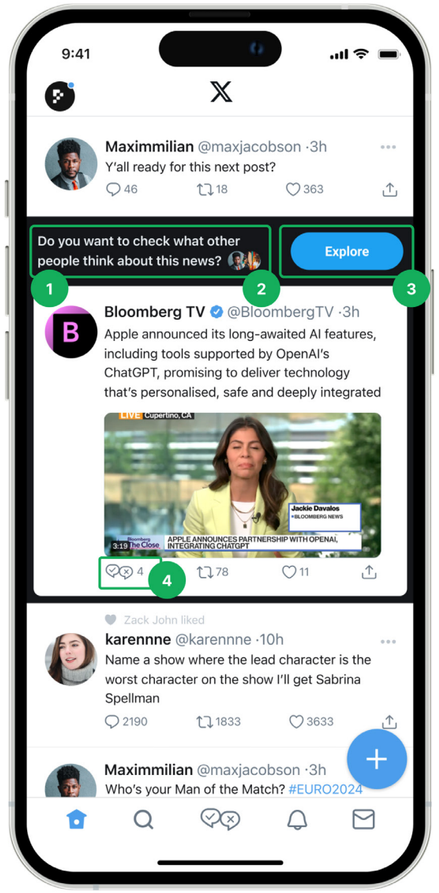


Figure 25. Insights on Priming design alternative

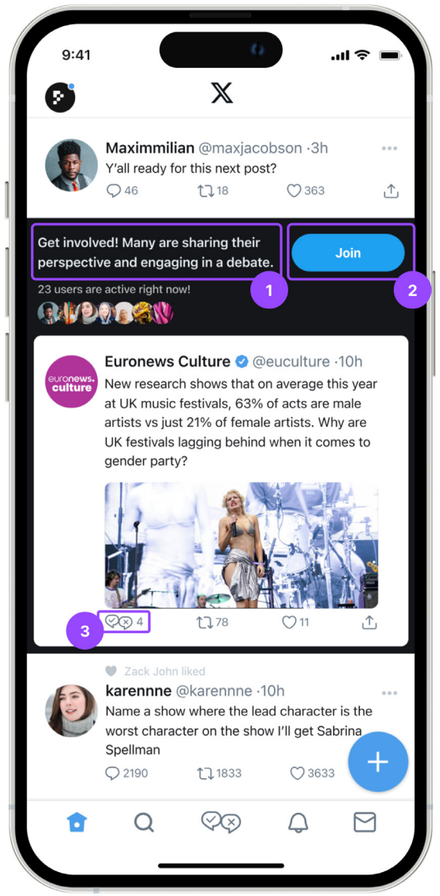


Figure 26. Insights on Social Norms design alternative

3. The meanings of "perspective" and "view" need to be clearly defined. Participants recommended using "view" to refer to people's opinions for clarity.

4. Participants preferred to see a glimpse of the discussion before clicking "discover".

6.5.2.3 Dedicated Discussion Space

1. Participants emphasized multiple times that only verified accounts should be able to join the discussion to eliminate fake accounts and bots.

2. A participant pointed out that the platform's emphasis is on sharing and discussing opinions rather than factual information, which makes the fourth rule less relevant.

3. One of the participants preferred to see the list of active discussions.

4. Participants questioned how these perspectives are created and clustered.

5. Participants mentioned that using green and red gives the impression of right and wrong. Additionally, providing only two options makes them pick either one of them intuitively.

Figure 27. Insights on Loss Aversion design alternative

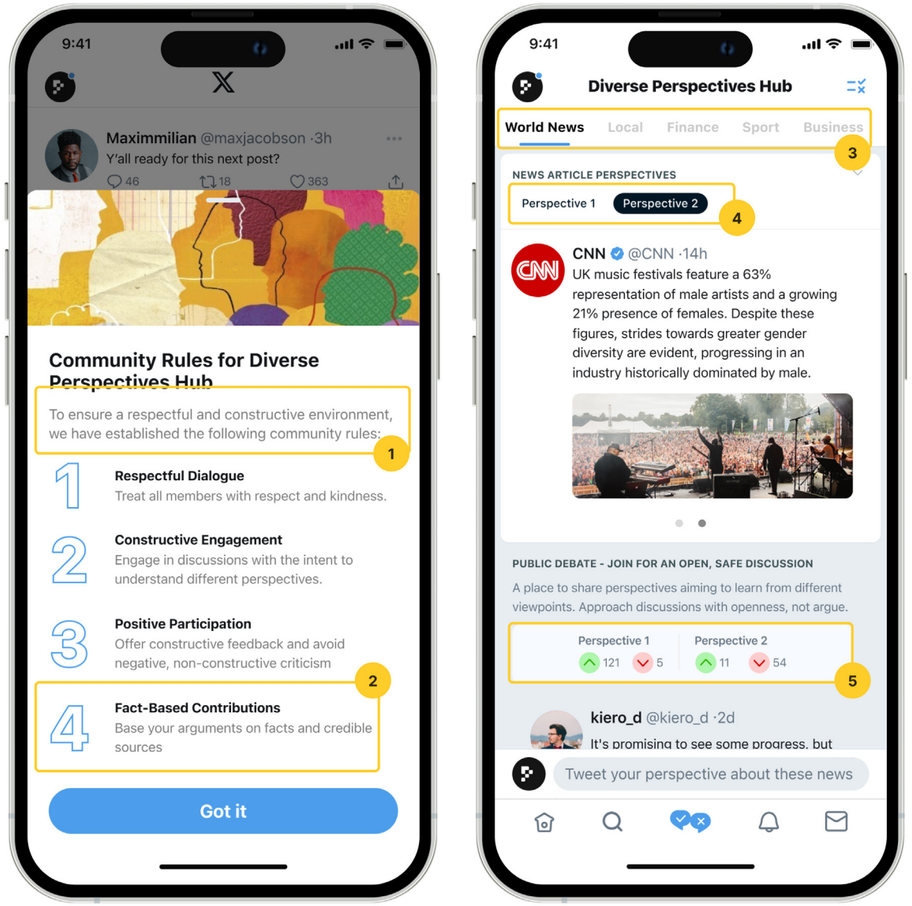


Figure 28. Insights on dedicated discussion space

6.6 Takeaways from the Session

This section synthesizes key takeaways from the user evaluation session, highlighting the essential insights, preferences and concerns expressed by participants. Key takeaways are explained below in detail.

- **The importance of clear wording:** Participants were confused about terms like "others" and "perspectives," seeking clearer definitions and better clustering of these terms. Questioning if "debate" is the right term; perhaps "hearing voices" is more appropriate. They mentioned that "join" implies active participation, while "explore" allows a space for observation which they preferred "explore" over "join" for encouraging passive observation.

Overall, during the session the discussions showed that clear and precise wording is essential for user understanding.

- **Seeking for statistical information:** Participants desired statistical information on user engagement to get a better idea about the reach of the news and discussions.

- **Clear presentation of perspectives and moderation in the discussion space:** Users emphasized the need for clear presentation of perspectives with statements and the presence of a moderator to manage discussions. Determination of the perspectives and how they are clustered are questioned during the session.

- **Concerns about transparency and the nature of X:** There were significant concerns about transparency, data tracking, privacy, and the potential bias of exposed news sources. Participants also doubted if healthy discourse was possible on a platform they classify as toxic. (See section 6.5.1.4)

- **Conveying the right message:** Participants mentioned that cross and check symbols in the icon should be reconsidered to avoid implying right and wrong opinions. Moreover, the icon of the space and the up/down voting system gives the impression of right or wrong state.

- **Preference of a seamless experience:** Users prefer a seamless experience and do not want to see these nudges after a while.

- **User unfamiliarity:** As the participants were regular X users, they found it challenging to imagine changes in the comment section with different icons and unclear navigation. Users asked for clarity on where they will be directed after clicking on this new feature.

- **Long-term testing is required:** Although all the participants engaged with the nudges, they mentioned that they were curious as it was their first time seeing this feature. The feature's effectiveness over long-term use should be tested.

6.7 Reflection to the Session Outcomes

As outlined in Chapter 6.3, the design proposals and user evaluation session aimed to answer the following questions:

What if we introduce frictions during incidental news consumption to encourage users to explore diverse views?

How can we promote healthy discourse online? What are effective ways to achieve this?

The session revealed that users prefer a seamless, effortless experience, which contrasts with the design's goal of introducing friction to encourage reflection and informed news consumption. While users engaged with the nudges and reflected that these disruptions heightened their awareness of content, they preferred these features to be temporary. This finding suggests that future designs should integrate these frictions in a manner that is contextually relevant and aligns with user preferences to minimize resistance. Being rejected by users does not necessarily mean that these features should be discarded; rather, designers should explore ways to implement these frictions in a user-acceptable manner and effectively communicate their necessity.

Participants also doubted the possibility of fostering healthy discourse on X, describing it as a toxic environment where people fight, which they even found the idea of having a healthy respectful discourse in X unrealistic. This surprising insight highlights participants' perception of X as a toxic place, despite all of them being regular users and enjoying their time at the platform.

The designs aimed to create a new space for respectful engagement, introducing a discussion space as a new feature to the platform. Participants questioned the value proposition of this new feature as they found it closely related to the already existing features such as Communities or Spaces. Additionally, since the discussion environment was designed as a conversation starter and was not fully developed, insights on promoting the quality of online discourse remain unresolved. Participants were unable to fully engage in the discussion environment, resulting in feedback that primarily reflected user preferences and concerns.

Outcomes of this chapter, including detailed reflections on user preferences, the impact of design frictions, and the challenges of fostering healthy discourse on social media platforms, will be further discussed in Chapter 8.

“Friction exists in many different forms and is not always a feature of design. Descriptively it can be, and normatively, sometimes it should be. Companies have implemented friction-in-design measures, often to serve their own interests and sometimes to promote a societal goal.”

(Frischmann & Benesch, 2022b)

CHAPTER 7

DESIGN RECOMMENDATIONS

In this chapter, the findings from the user evaluation session are discussed and translated into design recommendations for future research. As previously mentioned, the analysis was conducted in two parts: overall insights that cluster all insights from different design alternatives, and intervention-based insights. Due to the overlapping nature of these clusters and insights, the design recommendations are presented as a whole.

The recommendations are organized into three sections: disruption-related recommendations, which focus on the moment of incidental news exposure and the introduction of frictions; discussion space-related recommendations, which delve into users' expectations about an online discussion space; and redesign proposals, which aim to provide further insights and guidance for future practice and research by visualizing the recommendations in a conceptual way. This chapter includes:

7.1 Disruption Related Recommendations

1. The terms used in the future design should be clear and consistent.

The terms used in the design should be clear and consistent to avoid confusion and enhance user understanding. As mentioned in the previous chapter, participants frequently questioned the meanings of terms like “perspective,” “others,” and “views.” These terms were intended to represent diversity but caused confusion due to their vague and overlapping definitions.

To address this issue, it’s important to refer to the literature for suitable terminology. According to Helberger et al. (2016), there is no universally accepted definition of “diversity” and “pluralism” in media consumption. The British Ofcom’s (2012) report on measuring media plurality noted that an ideal outcome involves consumers actively sourcing information from multiple outlets, implying a need for diverse media consumption. However, Helberger et al. (2016) argues that these definitions still lack clear criteria for designing diversity-sensitive recommendation services.

This thesis adopts Habermas’s (2006) notion of the public sphere, which suggests that exposure to diverse viewpoints is achieved by making a range of opinions on a given topic visible or by bringing different viewpoints into contact through system design. (Helberger et al.,2016) This approach provides a more structured framework for defining diversity.

Therefore, instead of using “others,” which can marginalize people, the design can use “people” to refer to all users inclusively. Additionally, using “viewpoints” to describe people’s opinions can reduce confusion, as supported by both the literature and user feedback.

By adopting these clearer and more consistent terms, the design can better convey its intention to promote diverse viewpoints and improve user engagement.

2. Providing statistical/numerical information during the disruption is appreciated and seeked by participants when it is absent.

Participants expressed a preference for the inclusion of statistical or numerical information during disruptions. They appreciated seeing data such as the number of people engaged with the news or discussions. As mentioned, this information provides context and enhances their understanding of the news reach and engagement, giving them an incentive to participate or not. This is closely related to the psychological effect and nudges associated with social norms. According to Mirsch et al. (2017b), about social norms, people usually look at others’ behavior for guidance on how to act in uncertain situations. Although the initial design proposed using a single nudging method for each alternative, the feedback suggests incorporating social norms into the design proposals based on participants’ preferences.

Therefore, future designs should incorporate relevant statistical/numerical data to meet user expectations and enhance the user experience in the moment of disruption.

3. Using “Explore” over “Join” for Call-To-Action(CTA) Button is preferred.

Participants indicated that the term “explore” communicates the ability to observe without the need for active participation, making them more inclined to click it. Conversely, they associated the term “join” with active participation and expressed hesitation to click. Therefore, using “explore” as the CTA is recommended to encourage user engagement by offering inviting and less demanding option.

7.2 Discussion Space Related Recommendations

4. Concluding statements should be created to define news perspectives.

As discussed in previous sections, participants found it challenging to read news articles and identify distinct perspectives due to the time and effort required to understand and differentiate them. They suggested using concluding statements to summarize the perspectives related to news. This recommendation aligns with examples in the literature (see Chapter 3.6). Both ConsiderIt (Kriplean et al., 2012) and OpinionSpace (Faridani et al., 2010) encourage users to reflect on other perspectives by directing questions and employing techniques like rating statements or creating pro/con points. This approach, supported by both literature and participant feedback, shows that providing concluding statements or questions helps users easily grasp available perspectives and form opinions.

5. The process of creating and categorizing news perspectives should be clearly defined.

As highlighted in the user evaluation, not all news articles contain distinct perspectives. For those that do, it is essential to clearly define how these perspectives are created and by whom. The discussion space should be limited to news with specific perspectives or statements, acknowledging that it is not suitable for all types of news. One participant suggested using an AI bot to cluster news and create perspectives, controlled by moderators. This approach is considered applicable and relevant by the researcher but must be transparently communicated to users to address potential transparency concerns.

6. There should be a moderator to control the discussion space and foster a healthy discourse.

To ensure the discussion space enables healthy discourse, there is a need for moderators controlling and managing the space. All elements and decisions within the discussion space, including the role of moderators and the systems used, should be clearly communicated to users emphasizing the importance of transparency. While the session did not uncover specifics about the selection and roles of these moderators, these points will be discussed in detail in Chapter 9.

7. The future design should avoid features that imply right and wrong sides.

Participants expressed that offering only two options and differentiating them with colors like green and red, or using up and down votes, implies a judgment of right and wrong. This contradicts the goal of creating an inclusive space that brings together diverse viewpoints and fosters healthy, understanding discourse. To achieve this aim, the design should avoid communicating any notion of right and wrong sides and should focus on inclusivity.

8. The value propositions of a new feature should be clearly defined and explained to users.

During the user evaluation, participants, who were regular X users, found it challenging to differentiate the proposed discussion space from the existing comment section. They are familiar with the current interface and experience, so it’s crucial to clearly articulate how this new feature adds value. Highlighting the additional value will make users more eager to explore, understand, and utilize the new space effectively.

7.3 Redesign Proposals

Redesign proposals have been created based on user evaluation insights and design recommendations. These proposals aim to advance the research and offer suggestions. They are considered as research outcomes for further exploration and do not represent final designs. The proposals will be detailed in two sections: disrupting incidental news exposure and the dedicated discussion space.

Disrupting Incidental News Exposure focuses on the moment of incidental news consumption and aims to introduce frictions at that moment. This approach seeks to slow down the consumption process, encouraging users to reflect on the content they are consuming.

Dedicated Discussion Space revolves around the next step after disrupting users, encouraging them to reflect on the consumed content and nudging them to explore more. This space is designed to foster healthy discourse and provide a platform for users to engage with diverse perspectives in a structured environment.

By addressing these two aspects, the redesign proposals aim to create a more informed and reflective user experience, promoting a healthy online discourse online.

7.3.1 Disrupting Incidental News Exposure

As discussed in Chapter 5, during the initial design phase four alternatives are developed to explore different methods of introducing friction, each representing a distinct psychological effect and nudge. Following the analysis, all these alternatives were retained and improved based on user experience and feedback.

Participants expressed a desire for statistical and numerical information during the disruptions, which relates to social norms. Consequently, this type of nudge has been incorporated into all design alternatives during the redesign phase. Along with the initial nudging methods, each redesign proposal provides information about the people engaging with that news.

The redesign approach does not propose a single solution but offers ways of introducing friction into the interaction by ensuring a more comprehensive experience.

The images provided illustrate the redesign proposals, featuring both the initial designs and the new proposals. This side-by-side comparison highlights the differences between them, allowing for a clear understanding of the improvements made.

7.3.1.1 Framing & Social Norms

The redesign aims to maintain the friction that blocks the tweet and provides clear information, addressing the confusions caused in the initial design. The text is revised to offer clear information, enhancing user understanding. When users click the “show” button, they are presented the news with alternative perspectives from other news sources and the number of people sharing their opinions. This approach aligns with the psychological effects and nudging methods of framing and social norms.

To avoid confusion, terms like “perspective” and “support” are omitted based on the design recommendations. The redesign intends to slow users down by initially blocking the news content and providing information about it. After the friction, users see a screen displaying possible alternatives and the number of people engaged, encouraging a reflective engagement with the content.

Figure 29. Framing & social norms redesign proposal

7.3.1.2 Priming & Social Norms

Based on the user evaluation session and design recommendations, the redesign proposal removed the term “others” to foster inclusivity. To enhance exposure to diverse news sources, an additional screen was added with the prompt, “Do you want to increase your exposure to diverse perspectives? Swipe to explore multiple news sources.” This aims to nudge users to prepare for exploring more content, as suggested by the priming effect.
On the next screen, users can see multiple news sources by swiping and information about the number of people sharing their viewpoints across these sources. This redesign incorporates both the priming effect and social norms by encouraging users to engage with diverse perspectives and providing information about the number of people engaged. This dual approach aims to increase user awareness and engagement with a broader range of news content.

7.3.1.3 Social Norms

As mentioned in the design recommendations, the CTA button has been changed from “Join” to “Explore” to communicate the ability to observe without active participation. The text has been rewritten for clarity and consistency. Instead of emphasizing that people are active, which raises transparency and tracking concerns, the design highlights that people are sharing their viewpoints.

By making these changes, the design uses social norms to encourage user engagement while addressing user concerns about privacy and transparency. This redesign aims to create a more welcoming and less intimidating environment for users to explore diverse perspectives.

Initial Design

Redesign Proposal

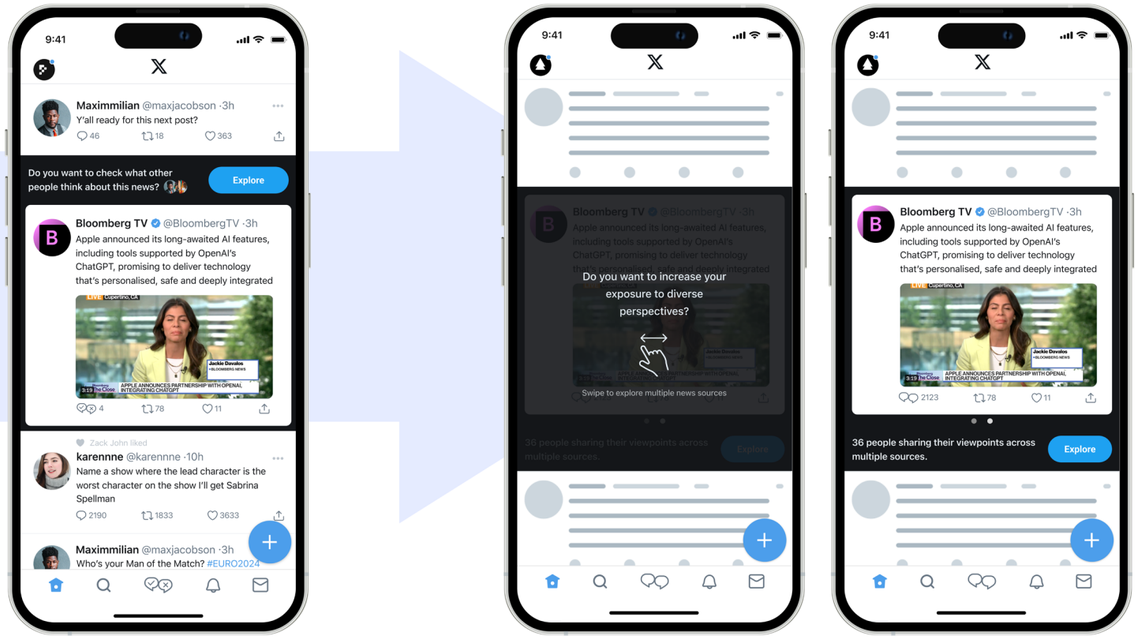


Figure 30. Priming & social norms redesign proposal

Initial Design

Redesign Proposal

Figure 31. Social norms redesign proposal

7.3.1.4 Loss Aversion & Social Norms

The initial design was created to block the news and provide information, nudging users by using the concept of loss aversion. However, as stated in Chapter 6.5.2, users found this design frustrating and did not want to interact with it, despite appreciating the statistical information about the number of people engaged.

The redesign proposal addresses these issues by directing a question to encourage users to think about the content, using phrases like "hear diverse viewpoints" or "people are sharing." Two redesign proposals were developed for these two nudges. The variations involve minor sentence adjustments, placement of the information, and providing information about people's involvement in both numerical and statistical ways.

As mentioned in the design recommendations, participants preferred to see a glimpse of the ongoing discussion in the discussion space. This redesign proposal addresses this preference by framing a question and nudging users to form an opinion. This approach aims to make the interaction less frustrating while still leveraging social norms and loss aversion to encourage reflective engagement.

Figure 32. Loss aversion & social norms redesign proposal

7.3.2 Dedicated Discussion Space

The initial name, Diverse Perspectives Hub, has been changed to Diversity Hub to avoid confusion regarding the term "perspectives." As discussed in Chapter 6.5.1.4, participants suggested that only verified accounts should be able to join the discussion space. However, since verified accounts are limited to those with a premium subscription (About X Premium, n.d.), this criteria was revised to allow only personal accounts to join, aiming to prevent bots and fake accounts from participating. Fact-based contributions were removed from the criteria, as the focus of the discussion is on viewpoints, making fact-based contributions irrelevant. (Figure 33)

An additional onboarding screen has been designed to explain how the discussion space works, aiming to provide transparency. (Figure 33) The space consists of three main elements: users, moderators, and an algorithm. The onboarding page covers relevant information about these elements and offers an option to learn more about the algorithm. Once users review these rules, they can access the discussion space. The rules can also be accessed via an icon in the left corner of the home page.

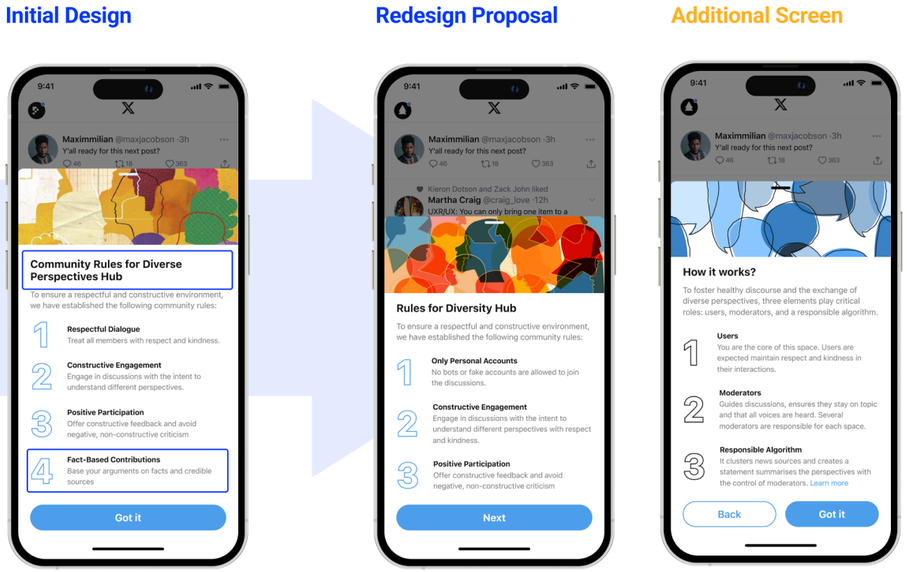


Figure 33. Changes on the onboarding screen

Figure 34 illustrates the changes made to the initial design proposal and presents the redesign. As emphasized in the design recommendations, concluding statements have been added to define specific perspectives. Users can click on perspectives to read the related statements and swipe through different news sources. The discussion space is designed to bring together people from different viewpoints, regardless of the news source they encounter or believe. Up and down votes have been removed based on the design recommendations, as they suggest right and wrong sides and do not align with the inclusive aim of this discussion space. The same revision was made to the icon of the diversity hub, located in the navigation bar, and the wording was fixed and clarified as discussed.

An additional screen has been designed to display current discussions, serving as the home page for this feature. The discussions are titled to give a broad idea of the topic, showing the number of participants involved, online participants, and the number of relevant news sources linked to the discussion. The number of moderators and their accounts can be found, as well as alternative perspectives offered in this space. Showing current discussions was recommended by a participant in the user evaluation session and included in the design proposals to provide users a broader picture. (Chapter 6.5.2.3)

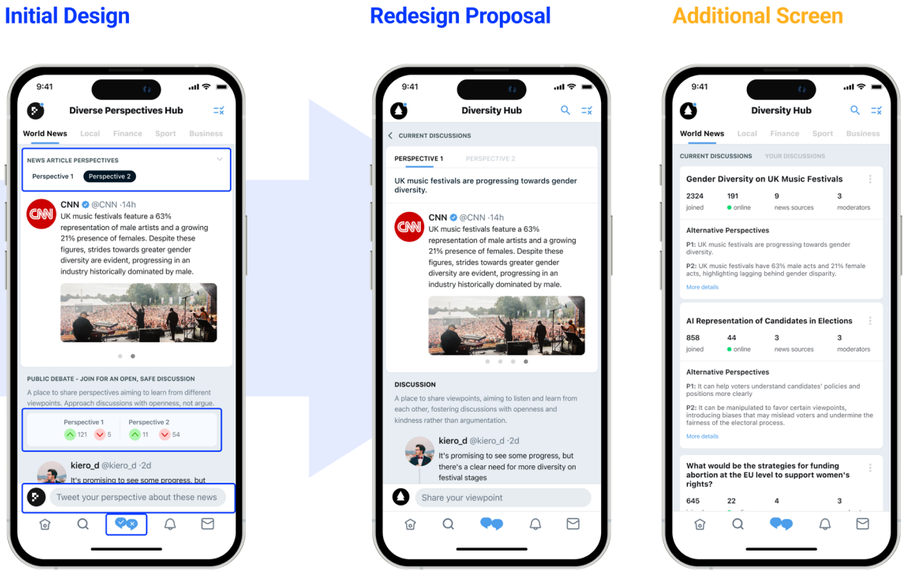


Figure 34. Changes on the discussion space

CHAPTER 8

DISCUSSION & CONCLUSION

In this chapter, the findings from user evaluations and design recommendations are discussed. The chapter revisits the research questions, reflects on the insights gained, and outlines the research limitations. Finally, it suggests directions for future research and offers a personal reflection on the project, concluding with the thesis's contributions to fostering a well informed society through the design interventions. This chapter includes:

8.1
Discussion about the Process

This thesis focuses on the impact of social media personalization algorithms at the moment of incidental news consumption, considering the occurrence of echo chambers and their effects on both individuals and society. Due to the complexity of the topic, it encompasses many overarching subjects. The research questions provided in Chapter 2 evolved during the process as new perspectives and layers were introduced. While the literature review aimed to answer the initial research questions, it also brought forth additional related topics and layers. The theoretical foundation involved social media personalization systems, the occurrence of echo chambers, and incidental news consumption.

The thesis began with a design activist approach, which challenges the current system and seeks to implement changes. This approach introduced current EU regulations, such as the Digital Services Act (DSA), and democracy models into the discussion. Reviewing these elements in the literature helped finalize the research questions and provided a base for the next steps.

The design activist approach influenced the literature review and the exploratory steps of the project. A power map was created to identify and engage with key power holders who could influence and facilitate change within the existing system. Stakeholder interviews were conducted with various power holders, including a politician, non-profit organization members, a policy advisor, and a PhD candidate working on the AI Act. These interviews provided invaluable insights on a broader level. (see Chapter 4.2) Due to the complexity of the topic and the variety of stakeholders reached, the interviews were conducted with experts from different fields. This variety shaped the discussion topics based on the stakeholders' expertise, which created a challenge in clustering the insights and drawing conclusions. As some topics were discussed with only one participant, the conclusions were sometimes based on a single perspective. Therefore, the statement cards were clustered multiple times to find patterns, and triangulation has been done to validate findings by integrating information from diverse sources (Carter et al., 2014). The interviews were positioned as exploratory research in this thesis. The insights of the interviews highlighted the missing perspective in the research: user perspectives.

The next part of the research focused on users, exploring their perspectives on a micro level (see Chapter 4.3). Provotypes were designed to gather insights on users' understanding and approach to personalization algorithms, their acceptance of potential tools, and ways to promote self-reflection. This exploratory phase focused on both macro and micro levels of understanding the related topics.

Given the scope of this thesis focusing on X (formerly Twitter) as a social media platform, an investigation into the dynamics of X was conducted. This investigation covered the current features of X, ongoing discussions, and the potential of these features and problem areas. The literature review also examined existing design interventions to learn from them. At this phase, the dual framework of the thesis, focusing on both macro and micro levels, shifted to a micro level to intervene in users' experiences in a designerly way and promote diversity exposure.

The research guided the design decisions and the creation of design criteria. Designing frictions and nudging were found to be relevant methods and were incorporated into the initial design phase. The designs consisted of three main elements, all incorporating important aspects of the design proposal. The landing page was designed to communicate the value proposition of the feature, while four alternatives explored different nudging methods and related psychological effects, all designed as frictions. In the final phase, the discussion space was designed as a conversation starter to gather users' opinions, preferences, and concerns about these spaces. The first two elements of the design were interactive prototypes that users experienced during the session. The user evaluation session aimed to discuss all three elements equally, but it mainly focused on the dedicated discussion space, as participants were particularly curious about it and wanted to learn more. However, as the discussion space is designed as a conversation starter and lacks detailed features, the discussions evolved around questions, participants' preferences, and concerns.

Although the project began with a design activist approach, this perspective primarily influenced the exploratory phase. Over time, the project evolved and moved away from a strictly activist stance. While the project adopts a disruptive approach aimed at changing the current system for a better-informed society, the research outcomes no longer fully align with a design activist framework. The shift in focus means the project is not strictly considered a design activist initiative, despite its ongoing intention to challenge and improve the existing system.

8.2
Discussion about Recommendations & Implementation

Emerging key points during the user evaluation covered in this section in detail.

Firstly, participants questioned the value proposition of the dedicated discussion space. This could be attributed to the design being a conversation starter or its perceived similarity to traditional comment sections. The initial design, which included the landing page, disrupting incidental news exposure, and the dedicated discussion space, was communicated as a new feature to emphasize their interrelated functions. However, participants suggested integrating this feature with existing functionalities such as comment sections, Spaces, and Communities on X. While the decision to offer this as a standalone feature aimed to create a distinct environment separate from the mainstream nature of X, this effort was not fully appreciated by the participants. Regardless of whether the feature is standalone or merged with existing ones, the design proposals aim to reflect the value proposition of increasing exposure to diverse viewpoints and creating spaces where people with diverse viewpoints can come together. This value proposition can either be integrated into existing feature sets or proposed as a new standalone feature.

Another significant point raised was the inclusion of moderators in the discussion space. Participants mentioned that there should be a responsible person in this space and someone should keep this as a healthy discourse rather than a fight. However, the selection process of these moderators is not discussed during the session. Reflecting back to the discussion that has been made, there should be multiple moderators managing the space to provide a better judgment. These moderators could be selected from volunteers and supported by non-profit organizations advocating for online rights such as EDRi (European Digital Rights (EDRI), 2024), thereby supporting a better-informed society aligning with their advocacies.

Regarding the introduction of frictions to the incidental news consumption, participants mentioned that they are not willing to see these frictions all the time and they prefer a seamless experience. (See Chapter 7.4.1) Nowadays, digital networked technologies and their associated socio-technical systems aim to; optimize efficiency, remove friction, seamlessly interconnect various components and enhance the speed, scale, and scope of technologically-mediated interactions. (Frischmann & Ohm, 2024) Therefore, users expect their social media experiences to be

seamless and smooth explaining their stance against the frictions. However, it is crucial to recognize that some degree of friction is essential for thoughtful decision-making and social interactions. Friction can slow down the fast-paced, attention-deprived world, offering moments for reflection and reconsideration (Frischmann & Benesch, 2022b). Introducing friction during the incidental news exposure on social media is highly relevant due to the nature of the interaction being mindless, very brief and unconscious many of the times. Thus, while users might resist these disruptions, they play a vital role in fostering a well-informed society by encouraging users to pause and reflect on their interactions.

The introduction of a chronological feed, as discussed in the context of the Digital Services Act and the exploratory interviews in this thesis, represents a step forward but may not be sufficient on its own. This thesis advocates for the integration of frictions into endless social media feeds to increase exposure to diverse viewpoints and bring people together with diverse viewpoints. It conveys this advocacy by proposing specific design recommendations and proposals. While acknowledging that influencing regulations is a long-term process requiring comprehensive research, this work goes beyond its scope and hopes to serve as an initial step toward that goal.

In summary, this research indicates that not all social media experiences should be seamless. Incidental news consumption can benefit from being seamful, with thoughtfully introduced frictions providing opportunities for users to slow down and explore diverse perspectives. This approach aims to contribute to a well-informed society and a healthier democracy.

“No one advocates for speed bumps on all streets. Speed bumps are deployed selectively, typically by municipalities, to inject friction as needed to calm traffic and thereby serve the social goals of economic efficiency, public order, safety, and shared use of streets.”

(Frischmann & Benesch, 2022b)

8.3
Revisiting Research Questions

The research questions initially outlined in Chapter 2 were explored through a comprehensive literature review, an exploratory phase, and a user evaluation session. This chapter will revisit these questions, summarizing the findings and insights gained during the research process.

RQ1: How can we increase exposure to diverse viewpoints in incidental news consumption on X(formerly Twitter)?

In the scope of this thesis, the literature review about nudging and designing frictions have been seen as an opportunity and effective methods for intervening at the moment of incidental news consumption. Recognizing this opportunity, the initial design proposals incorporated these methods. Given that incidental news consumption occurs briefly and at the initial moment of interaction, it is crucial to intervene at this point to enhance exposure to diverse viewpoints. The design recommendations and insights from this thesis concluded that introducing friction during incidental news exposure increases users' awareness of the content they see and encourages them to reconsider the news they consume (See Chapter 7.4.1).

RQ2. How can design interventions bring users with different viewpoints together on X?

Personalization algorithms on social media platforms often lead to users encountering different content, making them unaware of the perspectives they might miss. Therefore, it is essential to create spaces where users can come together with diverse viewpoints. A dedicated design space was proposed as a conversation starter to gather insights about people's perceptions and concerns. This space aimed to present different news sources together, allowing users to engage in discussions regardless of the news source they encountered or believed in. However, the user evaluation session revealed several challenges with this approach. Due to the toxic nature of X (See Chapter 7.4.1) and the prevailing attitude of users to engage in combative interactions, participants found the idea unrealistic. They also struggled to see the main difference between this dedicated space and the existing comment section, which may be attributed to the incomplete nature of the design.

Consequently, this question remains partially unanswered. It has become evident that designing these spaces as conversation starters is insufficient. It is also necessary to bring people together in a way that fosters a genuine discussion environment to gather comprehensive feedback. Therefore, further development and testing are needed to refine these spaces and address the identified issues, ensuring that they effectively bring users with diverse viewpoints together and facilitate healthy discourse.

RQ3. What would designed discussion spaces that bridge echo chambers to foster healthy discourse look like?

The dedicated discussion space, designed as a conversation starter, was evaluated to understand users' preferences and concerns. The insights showed that users seek transparency in spaces that bring together different news sources and perspectives. It is crucial to clearly define and cluster news perspectives and ensure the presence of a moderator to manage the space. Participants preferred concluding statements that refer to news perspectives due to their convenience. To foster healthy discourse, the design should avoid features that imply right and wrong sides and should instead promote inclusivity. Further research can build on these insights to refine the design of discussion spaces that bridge echo chambers and promote healthy discourse.

8.4
Limitations of the Research

This thesis presents several limitations that should be considered when interpreting the findings and design recommendations.

First of all, the user evaluation session focused primarily on the initial experiences, reactions and perceptions of participants to the design proposals. This short-term evaluation did not allow for the assessment of long-term engagement, and user adaptation. Future research should include long-term studies to understand how users interact with these frictions and discussion spaces over time and how their behaviors and attitudes might evolve. The user evaluation was conducted with a small sample size of only six participants which were all university students. This limited sample size restricts the generalizability of the findings, as the insights gathered may not be representative of the broader user base of X. A larger and more diverse group of participants would provide more robust and comprehensive feedback, improving the reliability of the conclusions drawn. Controlled environment of the user evaluation session may not accurately reflect the real-world dynamics and complexities of X. The platform's toxic nature and users' tendency to engage in combative interactions present significant challenges that were not fully replicated in the evaluation setting. Future research should explore the applicability of these design interventions in the actual social media environment to better understand their real-world effectiveness.

Secondly, the dedicated discussion space was designed as a conversation starter rather than a fully completed design. As such, it was not thoroughly developed to the point where it could be tested comprehensively. This incomplete nature of the design limited the ability to gather fully representative feedback on their effectiveness and usability. Therefore, it only provided insights about users' preferences and concerns about designing these kinds of discussion spaces.

Lastly, participants in the user evaluation expressed skepticism about the feasibility of fostering healthy discourse on X, given its existing reputation for toxicity. This resistance to change highlights the need for additional strategies to address user perceptions and build trust in the new design spaces. Future research should explore ways to overcome these challenges and foster a more positive and constructive user environment.

8.5
Suggested Future Research

This thesis provides insights into the challenges and opportunities of designing interventions to disrupt incidental news consumption and foster healthy discourse on social media platforms. While the proposed designs showed potential, further research and real-world testing are essential to refine these interventions and address user concerns effectively. Several points are listed for the further research to develop on this research:

- **Conducting evaluations with larger and more diverse participant groups is necessary to gather more representative insights.**
This will help assess the long-term engagement and impact of the design interventions, ensuring their effectiveness across various demographics and user behaviors.

- **Future research should implement the design spaces in actual social media environments to evaluate their real-world applicability and effectiveness.** This will provide valuable data on how these interventions perform outside controlled settings and in the dynamic, often unpredictable

context of social media platforms.

• **Exploring strategies to overcome user resistance to frictions and build trust in the new design spaces is crucial.** Research should focus on developing methods to introduce frictions in ways that are acceptable to users, explaining their necessity, and demonstrating their benefits for a more positive and constructive public environment. Designers should explore ways to implement these frictions in a user-acceptable manner and effectively communicate their necessity.

• **Understanding the long-term impact of these design interventions is essential.** Future research should investigate how continuous exposure to these frictions affects user behavior, information consumption, and overall engagement with social media over time.

• **Emphasizing the importance of transparency, inclusivity, and user engagement in developing design solutions is important.**
Ensuring that users are part of the design process can help create more effective and accepted interventions, promoting a more informed and diverse public discourse.

By addressing these areas, future research can build on this thesis, contributing to the development of social media environments that promote well-informed society and foster healthy discourse.

8.6
Reflection to the Project

At the beginning of this project, I set myself personal ambitions and aimed to deepen my understanding of transparency in AI, learn about users' perspectives of personalized systems, and explore future possibilities.

I was enthusiastic about delving into diverse design methodologies, such as research through design and design activism, with the aim of empowering users in their interactions with AI. Reflecting on these ambitions and the overall project journey, I am very happy with this thesis.

As the project progressed, I realized the complexity of the topic, which includes not only technological aspects but also social impacts on individuals and society. I soon found that the project ran the risk of getting out of hand due to myself feeling not in control of my own project. Taking steps in the beginning without planning it properly put the project in danger and I had to redefine and adjust the project's scope. Nevertheless, I am most proud that my years of study have taught me how to deal with issues during the process and find my interests while researching and designing in a structured and systematic way. I am very grateful for the input, critique, and support from my supervisors, who guided me throughout this journey.

Working on this project, I learned a lot as a designer. Throughout the process, I found myself interested in AI ethics and responsible AI practices, as I enjoyed their complexity and interdisciplinary connections. Understanding AI is not just about technology but also its impact on individuals and society broadened my perspective. I learned about EU regulations, policymaking, democracy models, and recommender systems. The complexity of the project and its connections to various disciplines were both challenging and rewarding. I gained practical experience by conducting user sessions, analyzing data, and integrating literature into my work. This process expanded my design research methods, including creating design proposals, leading user sessions, conducting interviews, and discussing my work.

I am grateful for the insightful conversations and the people who helped me gain a more realistic and holistic understanding of my work. Looking back, redefining the project to transform the research into a structured and systematic approach was one of the greatest challenges. Although there were challenges on the way, I am proud of my progress and the results I achieved.

Ultimately, I managed to adjust and adapt to the environment, engaging with scientific literature, methodologies, and data gathered through user sessions. I am pleasantly surprised by how much I have learned through this graduation project, in addition to my master's studies. I am proud to be graduating with an MSc degree from TU Delft. I look forward to discovering further ways in which design can bring benefits and to exploring new opportunities after my studies!

8.7
Conclusion

This thesis explores and addresses designing interventions that disrupt incidental news consumption and foster healthy discourse on social media platforms. By analyzing qualitative data obtained from expert interviews, provotypes and a user evaluation session, this research identifies both the challenges and opportunities in creating such interventions.

The literature review introduced interdisciplinary layers to this thesis including recommender systems, echo chambers, EU regulations, and democracy models. All these layers provided a guideline for the exploration of potential changes to the social media landscape and brought different topics together. Interviews with key stakeholders, including politicians, non-profit organizations, and policy advisors, offered valuable insights as an exploratory research and identified aspects that had been overlooked. The study shifted to a detailed investigation of the X(formerly Twitter), analyzing its features and potential problem areas. This led to the development of design proposals that introduce frictions in incidental news consumption to increase exposure diversity and bring people together with diverse viewpoints in healthy online discourse. The design process included creating interactive prototypes and a dedicated discussion space, intended to serve as a conversation starter for users to share their opinions and concerns.

Key findings from the user evaluation session highlighted actionable recommendations for future research as well as creating redesign proposals to further develop the research.
The key findings about the dedicated discussion space include that it is crucial to use clear and consistent terminology, such as "people" and "viewpoints," to enhance user understanding and engagement. Additionally, the design should include concluding statements to summarize news perspectives, clearly define and categorize these perspectives, and ensure transparency in the process. Moderators are essential for managing the discussion space and fostering healthy discourse, while the design should avoid implying right or wrong sides to maintain inclusivity.

To introduce friction to endless scrolling, users expressed a preference for incorporating statistical or numerical data during disruptions to provide context about the broader picture. The term "explore" is favored over "join" for Call-To-Action buttons, as it is perceived as less demanding and more inviting. Lastly, it is important to clearly communicate the value proposition of new features to differentiate them from existing ones and encourage user engagement. These insights aim to guide the creation of more effective social media features that promote diverse viewpoints and a well-informed public.

While the user evaluation session provides valuable insights, comprehensive evaluations with larger and more diverse participant groups are necessary to gather representative insights and assess the long-term impact of these interventions. The findings highlight the importance of transparency, inclusivity, and user engagement in developing design solutions that promote informed and diverse public discourse. By leveraging these findings, future research can focus on implementing

design interventions within actual social media environments to evaluate their real-world applicability and effectiveness.

Finally, this thesis advocates for the introduction of frictions into endless social media feeds to bridge echo chambers and enhance the diversity of viewpoints encountered. In other words, this research demonstrates that social media experiences do not always need to be seamless. Thoughtfully introduced frictions can provide moments for reflection and encourage users to engage with a broader range of perspectives, ultimately supporting a more informed and democratic society.

This work represents an initial step towards a more thoughtful and informed social media experience, contributing to a healthier democracy and a better-informed public. While the thesis acknowledges that influencing regulatory change is a long-term endeavor, it hopes to go beyond the scope of the thesis and be an influence to the future regulation practices.

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