From Scroll to Soul: Design Features of Social Media Platforms and Their Impact on Users' Mental Well-Being

MSc thesis
Management of Technology

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TU Delft

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by

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Preface

In an era where social media is intertwined with our daily lives, the question of its impact on mental well-being has never been more relevant. Driven by a personal inability to envision a world without social media, yet recognizing its potential detrimental effects on mental health, I chose to explore the possibility of a social media platform designed with the well-being of its users in mind. This research, forming the cornerstone of my MSc degree in Management of Technology, investigates design interventions within social media platforms that could enhance mental well-being. The findings of this study are intended as a guide for social media platform developers, offering insights into responsible social media platform design.

I owe a tremendous debt of gratitude to my graduation committee. Thank you Caroline Figueroa for your enthusiasm, care, and invaluable advice; thank you Lavinia Marin for the exciting discussions we had that helped steer this thesis; and thank you Mark de Reuver for your constructive feedback.

The irony of researching mental well-being while navigating the rigorous demands of a Master's thesis was not lost on me. I want to thank my family for their unconditional love and support, and for always making sure I was well-fed. I would like to thank my friends for the fun yet productive study dates we went on. Lastly I would like to thank Mees for providing both encouragement and support during the most challenging moments and for all the happy distractions.

On a final note, I would like to dedicate my thesis to my baby nephew Arya, who was born only a couple days before I had to hand in my thesis. We already love you so much.

Mani Jaff
Rotterdam, February 2024

Summary

Background. Mental health problems are on the rise among adolescents and young adults, and there is growing evidence pointing to social media as a potential influence. As technology becomes more intertwined with everyday life, affecting communication, work, and information consumption, the design decisions made by social media platform developers play a crucial role in impacting users' mental well-being. These design choices fundamentally sculpt the digital environments and interactions that people encounter daily.

Problem. While general negative effects of social media platforms are known, academic literature points out that that certain design features of social media platforms, such as likes and direct messaging, can distinctly influence mental well-being, yielding both beneficial and detrimental outcomes. However, there is a gap in understanding the specific effects of different features, and a comprehensive overview identifying the most significant ones for developers to prioritize is absent (Dawot & Ibrahim, 2014; Montag et al., 2019; Ong & Lee, 2022). This thesis aims to bridge this knowledge gap by analyzing different design features of social media platforms and their psychological impacts. The goal is to enable the creation of design interventions, which are strategies and actions aimed at enhancing (leveraging) users' mental well-being through the most significant design features. These interventions are intended for social media platform developers to incorporate into their social media platform design, creating a more mental well-being enhanced social media environment. As a result of this, the main research question has been formulated as follows:

"What social media design features can social media platform developers leverage to enhance the mental well-being of young adults?"

Research approach. Both White and Miller (2022) and Yang and Bai (2022) highlight that integrating values of ethical importance into the design of social media platforms could help in creating a social media environment that is more inclusive, accessible, and user-friendly for all users. That is why Value Sensitive Design (VSD) has been employed as the analytical framework for this research, which emphasizes the integration of values into the technological design process. While in available academic literature VSD has not been applied to social media platforms in the context of mental well-being, by doing so, interventions using design features can be proposed, which are called design requirements in VSD. This methodology employs a threefold approach, which can be applied in sequence, concurrently, or iteratively, covering three essential steps: conceptual investigation, empirical investigation, and technical investigation of the technology in question. This commences by firstly finding the relevant design features that significantly impact users' mental well-being through a literature review. Then, the aim is to find the values related to mental well-being in the context of social media platforms. This is done through expert interviews and a focus group. Furthermore, during the empirical investigation, a novel social media platform is to be introduced named Dime, which has been designed with its impact on mental well-being in mind. The design features found during the literature review are evaluated for Dime, leading to a list of design interventions which are aimed at enhancing users' mental well-being. Knowing both the relevant design features, values, as well as possible interventions, design requirements are proposed which are aimed at enhancing users' mental well-being on social media platforms.

Analysis. Key findings suggest that certain design features have profound implications for users' mental well-being, namely news feed, interactive features, notifications, direct messages (DMs), algorithmic recommendations, privacy settings, groups and communities, and multimedia integration. Furthermore, a list of 13 values have been identified surrounding mental well-being in the context of social media. These values have been divided up into higher and lower level, allowing for focusing design efforts on those values that are most critical in achieving the desired outcomes. Following this, the values were mapped to illustrate their interrelationships. In the context of Value Sensitive Design (VSD), it is important to examine potential conflicts between values. This typically occurs when the promotion of one

value inadvertently restricts another, resulting in an inter-value conflict. However, while for the higher level values it is not directly evident that there are any conflicts, conflicts arise not from direct opposition, but rather from the absence of a particular value that would otherwise harmonize with another. As such, the conflicts are between a *lack of authenticity* and *connection*, between a *lack of personalization* and *autonomy*, and finally between a *lack of control* and *autonomy*. This means that due the lack of the values of *authenticity*, tension is indirectly created with the value of *connection* by failing to support it. The same holds for the lack of both *personalization* and *control* with *autonomy*.

Redesign. As a result of the found conflicts, this thesis proposes a set of design interventions formulated as design requirements that aim to resolve these conflicts. As such, for the lack of *authenticity*, three design requirements have been proposed:

1. Remove quantitative aspects of interactive features;
2. Remove beauty or appearance enhancing multimedia integration, but keep filters which are for the purpose of entertainment;
3. Incorporate instantaneous content creation options.

Furthermore, because the values of *personalization* and *control* are inherently linked through a cause-and-effect relationship, they have been addressed together. As a result, four design requirements have been proposed:

1. Customizable reminders where users can select the content and tone of the reminders they receive;
2. Adjustable level of algorithmic recommendations;
3. Transparent notifications system that allows users to easily customize their preferences;
4. Implement additional news feed where the order of the content is chronological, without algorithmic sorting.

The proposed design requirements are aimed at enhancing the lack of the values, which in turn support the identified value conflicts. Thus enhancing *authenticity* leads to supporting *connection*, and enhancing *personalization* and *control* leads to supporting *autonomy*.

The subsequent formulation of these design requirements suggested alterations to only five of the eight design features, leaving direct messages (DMs), privacy settings, and groups and communities unchanged. This could either be because interventions for those features are linked to other values which are not necessarily conflicting, or they simply have not been mentioned often during the interviews and focus group.

Future research. Practical recommendations highlight the need for ongoing research, particularly in testing the long-term effects of these design interventions and expanding demographic study beyond young adults to gain a more comprehensive understanding of the impact of social media design on mental well-being. Future research could also explore non-design based interventions, like offline meetups, for their potential to improve mental health. Furthermore, there is a need for collaboration between social media developers and researchers to empirically test and refine these interventions, emphasizing the need for partnerships that navigate confidentiality and proprietary challenges effectively.

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Introduction

1.1. Problem background

Mental well-being concerns in young adults

Mental well-being issues are becoming increasingly prevalent among adolescents and young adults, with growing evidence that social media may be a contributing factor. In a study conducted by the American Psychological Association, significant increases in mood disorders and suicide-related outcomes within these age groups have been found, particularly among females and those from wealthier backgrounds. In the study, data was drawn from surveys answered by adolescents aged 12 to 17, and adults aged 18 and older. The results revealed a concerning trend of rising psychological distress amongst young adults aged 18 to 25, while older adults aged 65 and above displayed a decline in these issues (Twenge et al., 2019).

These findings included depressive symptoms, with an increase of these symptoms among young adults of 63%, where rates remained stable for adults aged 26 and older. Furthermore, another study conducted by Pew Research Center has found that American teens are extremely aware of these mental health issues, with anxiety and depression reported as greater concerns than bullying, drug addiction, and poverty (Vogels et al., 2022). In order to find the potential explanations for these generational disparities, researchers considered various cultural trends. Because during this time frame unemployment decreased and drug and alcohol use remained stable, it was put forth that economic and substance abuse factors may not be the primary drivers. A hypothesis suggested by the researchers is the parallel rise of social media usage. Apart from reduced face-to-face interactions, frequent social media users are also more vulnerable to cyberbullying, which has been linked to depression, self-harm, and suicidal thoughts. It was pointed out that the increase in major depressive episodes among adolescents coincided with the widespread ownership of smartphones and a rise in digital media engagement amid the age group since 2011 (Vogels et al., 2022).

Importance of well-being in technology design

It is important for designers and technology practitioners to prioritize the impact on mental well-being in information application and service design for several reasons. Firstly, technology plays an increasingly central role in our lives, influencing how we communicate, work, and access information. As such, the design choices made by practitioners have a profound effect on users' mental health, as they shape the digital experiences and interactions that individuals engage with daily. By focusing on mental well-being, designers can contribute to the creation of digital environments that promote positive mental health, reduce stress, and foster a sense of well-being among users (Yang & Bai, 2022). Additionally, addressing mental health considerations aligns with ethical and social responsibility principles, emphasizing the need to minimize potential harm associated with technology use. Lastly, as the impact of technology on mental health gains prominence, organizations that prioritize user well-being in their designs are likely to gain a competitive edge and foster stronger user trust and loyalty (Stray & Hadfield, 2023). In essence, the emphasis on mental well-being in information application and service design is both an ethical imperative and a strategic advantage in the modern technological age.

Research gap

Different social media platforms offer distinct characteristics due to different feature design, settings, and platform cultures. Ong and Lee (2022) discuss how social media companies use several design features to make their platforms addictive. These features reinforce addictive behavior and are incorporated into social media platforms universally. Furthermore, the article explains how certain design features of social media platforms can negatively impact mental health. For example, the use of social rewards, infinite scrolling, and user investment can reinforce addictive behavior and lead to negative mental health outcomes such as anxiety, depression, and loneliness. Additionally, the advertising business model that utilizes user data to present tailored content to users can contribute to negative mental health outcomes by promoting unrealistic expectations and social comparison. It is important to note that not all design features are inherently harmful and that the impact of these features on mental health can vary depending on individual factors and patterns of use (Montag et al., 2019). In addition, Dawot and Ibrahim (2014) mentions that certain design features of social media platforms can have both positive and negative effects on mental health. For example, features that promote social support and connection, such as group chats and online communities, can have positive effects on mental health by reducing feelings of loneliness and isolation. On the other hand, features that promote social comparison, such as likes and followers, can have negative effects on mental health by increasing feelings of anxiety and low self-esteem. Additionally, features that promote cyberbullying and harassment can have negative effects on mental health by causing emotional distress and trauma. While articles give examples of the different possible design features that potentially affect mental well-being, there is no overview available listing the most impactful ones which social media platform developers could focus on so that modifications yield the greatest benefits for users' mental well-being (Dawot & Ibrahim, 2014; Montag et al., 2019; Ong & Lee, 2022). While studies have pointed out that excessive use of smartphones and social media can lead to negative effects on mental health, such as anxiety, depression, and reduced well-being, the causal relationship between these effects and design features is still unclear and requires further investigation. While the overarching impact of social media on mental health is well-documented, there is a gap in understanding which specific design features contribute to these effects. This research aims to bridge this gap by examining various design features of social media platforms and their psychological implications. These design features are pivotal in shaping user experience and can influence behaviors and emotions, potentially contributing to mental well-being issues. This thesis does not extend to the empirical demonstration of clinical outcomes. The identification and analysis of specific clinical outcomes, such as diagnosable conditions of anxiety or depression, require extensive longitudinal studies, clinical assessments, and resources beyond the scope of this research. Instead, this thesis aims to contribute to the ongoing discussion by examining what design features might influence mental well-being, highlighting areas for future research and potential interventions within the design of social media platforms.

Analytical framework

Value sensitive design (VSD) can aid in designing social media platforms by integrating values of ethical importance from the start in the design process of new products and systems. Yang and Bai (2022) mention that in the case of social media platforms, VSD can help to reconcile the relationship between different stakeholders, so that direct stakeholders and indirect stakeholders can effectively participate in the process of technology design. VSD can also help to identify the exclusive values related to mental health into every stage of social media design. By considering the values and needs of users, value sensitive design can help to create social media platforms that are more inclusive, accessible, and user-friendly for all users. While Yang and Bai (2022) suggest VSD should be implemented into the design process of social media platforms, there is no framework or methodology available on how to designers can approach this for mental well-being. This is perhaps due to the challenge of defining mental well-being due to its multifaceted character and social media's dynamic nature. Van der Maden et al. (2023) highlight challenges such as selecting the appropriate theoretical paradigm for well-being, modeling well-being and its fluctuations, and the difficulty of measuring well-being in a context-sensitive manner. Meanwhile, White and Miller (2022) suggest that social media platforms should be designed with an understanding of the potential negative impacts they can have on mental health. They propose that designers should consider the ways in which their platforms can create suboptimal feedback loops that lead to addiction, depression, and other mental health concerns. By designing platforms that promote healthy feedback loops and minimize the potential for addiction and other negative outcomes, designers

can create social media platforms that are more beneficial for users' mental health. This might involve incorporating features that encourage users to take breaks from the platform, limit their time spent on the platform, or engage in activities that promote well-being. While VSD is not mentioned by White and Miller (2022), they do state that by incorporating values of ethical importance into the design process, designers can work to mitigate potential negative impacts and create platforms that promote positive outcomes for users. By applying VSD, this research aims to dissect the subtle yet profound ways in which design choices on social media platforms can either worsen or ease mental health concerns.

1.2. Research objective

In academic literature, discussions on digital well-being often revolve around the concept of interventions, which are strategies and actions aimed at enhancing users' mental health and emotional well-being in digital environments. These interventions are typically discussed in the context of psychological and behavioral outcomes, with an emphasis on mitigating the negative impacts of digital technology use (Twenge et al., 2019; Wishart et al., 2022). The objective of this research is to comprehensively explore what specific design features of social media platforms influence users' mental well-being, and to explore how interventions for digital well-being can be effectively implemented through the strategic use of design features on social media platforms. This involves a detailed analysis of various design features to understand their impact on mental well-being. Using VSD as an analytical framework, the study aims to bridge the gap in existing literature by providing a nuanced understanding of the relationship between design features and mental health outcomes. Additionally, at least two research studies indicate that VSD could be an effective method for integrating values into the design of social media platforms, particularly concerning mental well-being (White & Miller, 2022; Yang & Bai, 2022). What remains unexplored, however, is the direct implementation of VSD in the context of social media design and mental well-being. Conducting such a study would be instrumental in addressing the existing knowledge gap about the practical application of VSD in enhancing the mental health aspects of social media platforms. The goal is to offer insights and recommendations for designing social media platforms that are in line with mental well-being, which can be used by social media platform developers and thereby contribute to healthier digital environments. Social media developers are professionals who design, create, and maintain social media platforms and applications (Zenone et al., 2022).

In light of this identified knowledge gap, the primary goal of this research is defined as follows:

To utilize Value Sensitive Design in order to develop design interventions using design features that are found to have a significant impact on users' mental well-being, aiming to create a more mental well-being enhanced social media environment.

1.3. Research scope

In order to keep the focus of the research within subject matter, a number of relevant dimensions are to be identified in the scope. This includes the deliverable, subject matter, and boundaries of the research.

- As mentioned previously, the deliverable is to produce a detailed analysis of what specific design features of social media platforms impact mental well-being, and to formulate design interventions using these design features.
- The research is bounded by its emphasis on the design features of social media platforms, specifically in the context of mental well-being. It will not delve into broader sociological or economic aspects of social media use. The research is also limited by the scope of VSD as the primary analytical framework, focusing on how design can align with values related to mental well-being. The values related to mental well-being will also be explored during the literature review.
- The target group for the framework can be understood in two different ways. Firstly, the recommended design interventions are intended to be used by social media platform developers in order to create a mental well-being-enhanced social media environment. On the other hand, the implementation of these interventions is intended to be experienced by the users rather than the developers. Users, in this context, are young adults aged 18-25 years old. This age group is known to be heavily engaged with social media, making them particularly susceptible to its influences. Their experiences provide vital insights into the direct impact of social media design on mental well-being.

- Further aiding in developing design recommendations will be a use-case provided by Dime, a start-up dedicated to developing a novel social networking application designed to enhance users' social connectedness and overall well-being (Dime, 2023). Dime has incorporated interventions into their platform design aimed at enhancing mental well-being, which will serve as a contextual background for this thesis and to be discussed during empirical investigation.

1.4. Research questions

The main research question has been formulated as follows:

"What social media design features can social media platform developers leverage to enhance the mental well-being of young adults?"

Prior to applying VSD, it is essential to fully grasp its principles. Chapter 2 offers an in-depth theoretical examination of VSD, equiping the reader with a comprehensive understanding of VSD's role and potential in design, laying the groundwork for its practical implementation.

In order to answer the main research question, a number of sub-questions have been drafted:

Research sub-question 1

"What are the most relevant design features of popular social media platforms that significantly influence users' mental well-being?"

Understanding the most relevant design features of popular social media platforms is crucial to answering the main research question. This sub-question focuses on identifying which specific features of social media design have a significant impact on young adults' mental well-being. By conducting a literature review, the research can pinpoint problematic design features, which will be explored in chapter 3. This knowledge lays the foundation for developing design recommendations that social media developers can use to enhance the positive aspects of user experience, directly addressing the main objective of creating a more mentally beneficial social media environment for young adults.

Research sub-question 2

"What values are at stake when it comes to the design of social media platforms and its effect on mental well-being?"

While values are not directly mentioned in the main research question, VSD involves identifying and integrating stakeholder values, both direct and indirect, into technology design. For this research, design interventions will revolve around values in the context of social media platforms and mental well-being, which need to be found first through an empirical investigation. In order to answer the second sub-question, expert interviews will be conducted, as well as a focus group where Dime will be used as a use-case. Incorporating expert interviews and focus group discussions with the Dime use-case into this research is a methodological approach aligned with the principles of VSD. This approach enables the examination of real-world implications of design decisions from multiple perspectives: those of developers, mental health experts, researchers, and users. Conducting interviews and a focus group supports the main research question, providing insights into how design features of social media platforms can be optimized to enhance the mental well-being of young adults.

Research sub-question 3

"What interventions could be integrated into the design of social media platforms that aim to enhance users' mental well-being?"

The expert interviews and focus group also aim to answer the third research question. Exploring interventions to enhance mental well-being through social media design directly addresses the main research question and is essentially linked to VSD. By identifying specific interventions, the research aims to translate the previously found values and interventions related to mental health into concrete design requirements. In other words, VSD design requirements are interventions aimed by enhancing mental well-being through social media platforms' design features. This process ensures that the resulting social media platform features are not only technically sound but also ethically aligned with

enhancing young adults' mental well-being. It bridges the critical gap between values and practical design, making it a key component in achieving the primary goal of creating a user experience which enhances mental well-being.

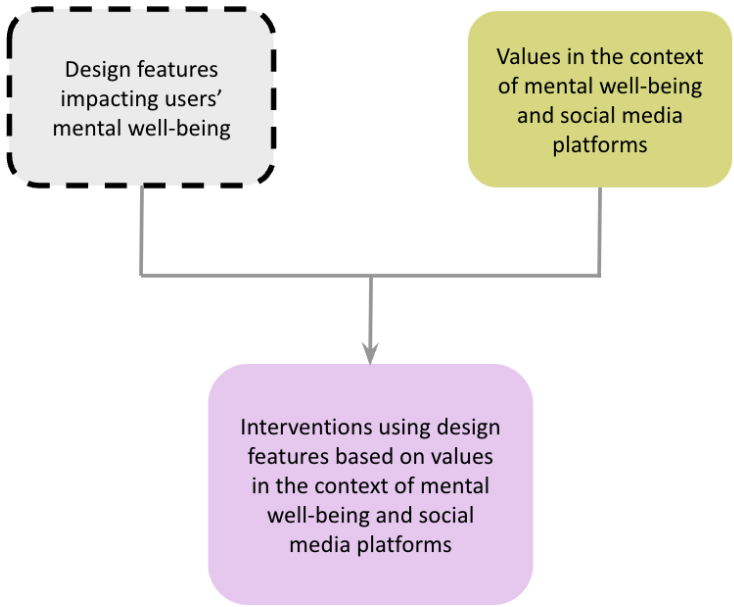

Figure 1.1: Conceptual diagram of the relationship between design features, values, and interventions

1.5. Research relevance

Managerial relevance

My current MSc Management of Technology (MOT) curriculum emphasizes how technology can be leveraged to design and create products and services that not only enhance customer satisfaction but also boost a firm's productivity, profitability, and competitive edge. Relating this to the topic of this research, as the link between technology and mental well-being becomes more pronounced, social media companies that focus on user well-being in their product and service designs are likely to achieve a competitive advantage (Stray & Hadfield, 2023). Essentially, integrating mental well-being into technology design serves not only as an ethical obligation but also as a strategic asset in today's tech-driven world. The findings of this study are intended as a guide for social media platform developers, offering insights into responsible social media platform design.

Academic relevance

The investigation into the influence of social media design on young adults' mental well-being carries substantial scientific relevance. This research addresses a gap in understanding how design features within digital platforms impact psychological health. This study's findings have the potential to inform more ethically and psychologically sound design practices in social media, enriching the field of technology management with new insights into the crossover of digital interfaces and mental well-being. Furthermore, a number of courses as part of the MOT curriculum have been particularly helpful in providing prior knowledge to writing this thesis. The course "Technology Dynamics" has been instrumental in understanding the societal impact of technological choices, guiding the focus on user-centric design in social media. "Research Methods" provided the tools for methodical inquiry and critical analysis, vital for this thesis' empirical approach. Additionally, "Social and Scientific Values" deepened the understanding of ethical considerations in technology management, aligning with this thesis's focus on VSD. This research contributes to MOT by demonstrating how technology can be managed not just for economic gains, but also for societal well-being, particularly in the context of mental well-being in the digital age.

1.6. Reading guide

This chapter introduces the research problem and outlines the study's objectives. Chapter **??** provides an explanation of the chosen analytical framework, namely Value Sensitive Design (VSD), and how it is applicable to social media platforms in the context of mental well-being. Following in chapter 2, an overview of the research approach is given, including the selected sources and how they are related to VSD. Subsequently, chapter 3 analyses social media design features and their corresponding effect on mental well-being. Chapter 4 consists of a stakeholder analysis. Next is chapter 4.3, where the novel social media platform Dime is discussed, along with their interventions. Furthermore, chapter 5 will analyse the semi-structured interviews and focus group and derive a list of values. Then, in chapter 6, following the list of previously defined values, design requirements will be developed from the discussed interventions. Chapter 7 discusses the research findings as well as its limitations. Finally, chapter 8 concludes this research with answers to the research questions, as well as opportunities for future research. The bibliography and appendices will serve as supplementary material to this thesis. Table 1.1 gives an overview of the key terms used in this research, along with their respective definitions.

Table 1.1: Defintions of key terms

Key term(s)	**Definition**
Design feature	A specific, built-in functionality or characteristic that influences user interaction and experience on the platform
Design requirement	A specification that emerges from the integration of human values into the design process. In this research, this will result from interventions using social media design features
Intervention	Strategies and actions aimed at enhancing users' mental health and emotional well-being
Social media platform developers	Professionals who design, create, and manage social media platforms and applications
Value Sensitive Design (VSD)	A theoretical and methodological approach to designing technology that accounts for human values throughout the design process
Value	Refers to what people find important in their lives

2

Research approach

This chapter offers a comprehensive overview of the analytical framework relevant to this thesis. It begins by explaining Value Sensitive Design (VSD), an analytical framework for embedding values into the design of technical artifacts. The chapter also addresses constructing a values hierarchy, as well as shortcomings of VSD. Next, the chapter outlines the research methods for data collection, which is followed by an overview of the research, incorporating VSD's phases into the research.

2.1. Analytical framework

This section offers a comprehensive overview of the analytical framework relevant to this thesis. It firstly begins by examining the role of values in technology, followed by an explanation of the three investigation stages of VSD. Next, the it is explained how to get from a value to a design requirement.

2.1.1. Value Sensitive Design

In its most restricted definition, the term ”value” is often understood as the financial worth of an item. However, in the context of this research, a more expansive interpretation of ”value” is adopted, where it signifies what individuals or groups consider important in their lives (Friedman et al., 2013). Table A.1 in appendix A.1 gives an overview of human values of ethical importance which are often implied in system design. Value sensitive design (VSD) emphasizes the integration of ethical considerations into the technological design process. This involves a tripartite methodology, whether conducted sequentially, simultaneously, or in a repetitive cycle, encompassing three key areas: conceptual, empirical, and technical investigations of a studied technology. It highlights the idea that those involved in creating technology should be acutely aware of the ethical implications of their work. VSD underscores the moral awareness and ethical responsibilities of designers and researchers, urging them to recognize how their decisions might impact the well-being, rights, and aspirations of all stakeholders (Hendry et al., 2021).

Conceptual investigation

Conceptual investigations, which require the least context-specific knowledge, involve an analysis to clarify the fundamental issues of a technology, project, or innovation and identify the values involved. Key questions in this phase include identifying the values at stake, understanding how stakeholders are impacted by these values, and determining how to balance competing or conflicting values in the design process. To address these questions, it is crucial to carefully consider the relevant stakeholders. An initial question like ”who are the stakeholders affected by the design?” can be a starting point for the analysis. VSD differentiates between two types of stakeholders: direct stakeholders, who interact directly with the system, and indirect stakeholders, who are affected by the system's use (Friedman et al., 2013). Addressing questions in conceptual investigations typically involves consulting existing literature.

Empirical investigation

While conceptual investigations provide a foundational understanding, they often need to be supplemented with empirical research to fully grasp the human context surrounding a technical artifact. Em-

pirical investigations are essential for evaluating the effectiveness of a design and can encompass any observable, measurable, or documentable human activity. This includes a wide array of quantitative and qualitative social science methods such as observations, interviews, surveys, experimental manipulations, document collection, and measurements of user behavior and physiology (Friedman et al., 2013).

Technical investigation

Technical investigations encompass two distinct approaches. The first approach centers on examining how the existing features and fundamental mechanisms of technology either support or impede human values. The second approach is more proactive, involving the design of systems specifically to uphold the values identified during the conceptual investigation phase. While technical investigations, particularly the first type, might appear similar to empirical investigations due to their involvement with technology and empirical activities, they differ significantly in their primary focus. Technical investigations concentrate on the technology itself, carefully inspecting its properties and mechanisms. In contrast, empirical investigations are concerned with the people, groups, or broader social systems that interact with, utilize, or are impacted by the technology. This distinction lies in the unit of analysis, with technical investigations targeting the technological aspect and empirical investigations focusing on the human and social dimensions (Friedman et al., 2013).

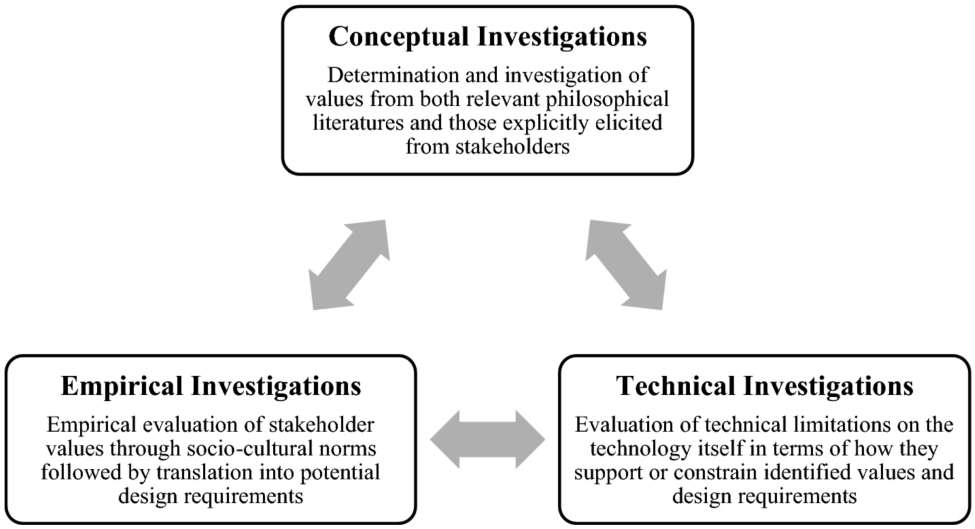

Figure 2.1: VSD tripartite framework (Umbrello, 2020)

2.1.2. Values hierarchy

Once the values have been identified, they are to be translated into design requirements. The process of converting values into specific design requirements is an area that has not received adequate attention in VSD. Design requirements outline the necessary properties, attributes, or functionalities that a designed artifact, system, or process must have. For VSD to effectively integrate values into design, these requirements must be informed, at least in part, by values (Van de Poel, 2013). In academic literature on the effect of social media on mental well-being, the term ”intervention” is used which refers to a strategic modification or enhancement aimed at supporting user mental or psychological well-being. This involves altering design features, user interfaces, or implementing specific strategies. The objective of this study is to develop design requirements based on these interventions. Van de Poel (2013) introduced the concept of a ”values hierarchy” as a method to incorporate values into design. This method transforms abstract values into concrete design requirements, ensuring that the design adequately represents the moral values involved. A concise overview of Van de Poel (2013)’s values hierarchy is presented next.

In a values hierarchy, the top layer consists of values, the bottom layer of design requirements, and typically, there is an intermediate layer of norms. According to Van de Poel (2013), the term ”norm” here refers to various prescriptions for, and limitations on, actions. Particularly significant in design are

end-norms, which are norms aimed at achieving or pursuing a specific end. End-norms are important in design because design focuses on creating technical artifacts or their blueprints. These end-norms might refer to properties, attributes, or capabilities that the designed artifact should have (Umbrello, 2020). The foundational layer of a values hierarchy is made up of design requirements. These requirements are highly specific and context-sensitive, offering more detail compared to norms. A design requirement delineates particular applications of a norm, specifying the goals or objectives to be pursued, or outlining the specific actions or methods necessary to attain these objectives. The structure of a values hierarchy is illustrated in figure 2.2, showing the three fundamental layers. In this research, design requirements come from interventions which leverage design features of social media platforms. These design requirements are devised to operationalize the norms and values identified as central to enhancing user mental well-being, translating their abstractness into tangible design requirements. The objective of this research is to create a values hierarchy for mental well-being in the context of social media, where values and norms are identified, and design requirements are formulated based on design features' interventions.

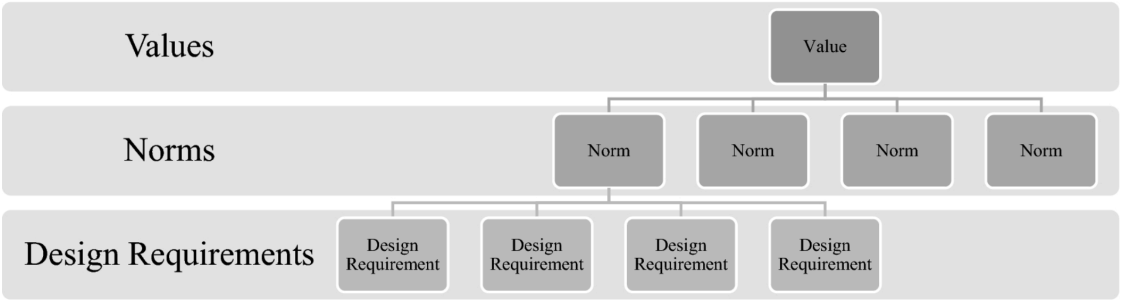

Figure 2.2: Layers of a values hierarchy (Van de Poel, 2013)

Constructing a values hierarchy can be approached both from the top-down and bottom-up. In the top-down method, the process begins by identifying core values and subsequently developing design requirements. Conversely, the bottom-up approach starts with specific design requirements and works upwards to identify overarching norms and values.

While the top-down approach is favored, it is important to acknowledge its limitations concerning the representation of values. In this research, existing literature is examined to compile a comprehensive list of values, norms, and design requirements. However, there is a possibility that certain values may not be as prominently featured in the literature, either due to lesser appeal to the participants or a lack of awareness among stakeholders. Consequently, relying solely on a top-down approach might lead to a skewed representation of essential values. To address this, design features and interventions will be discussed during interviews and focus group, which will then be linked to the corresponding values through a bottom-up approach. This step serves a dual purpose: it not only validates the values initially identified but also acts as a supplementary method to ensure a more inclusive and accurate representation of values in the analysis. This is also known as grounded justification, which suggests that the justification or reasoning is based on foundational, often lower-level elements. It implies that the basis for decisions, actions, or principles is not abstract or theoretical, but rather rooted in concrete or practical considerations (Van de Poel, 2013). Figure 2.3 displays the values hierarchy in the context of this research.

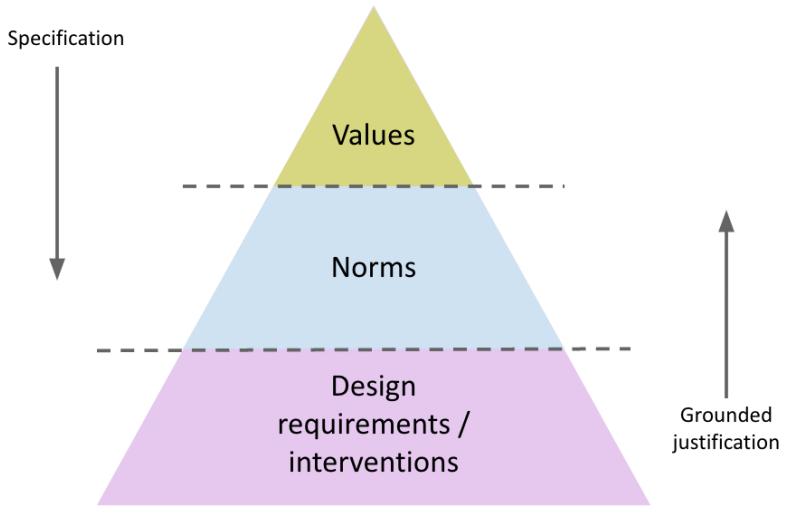

Figure 2.3: The values hierarchy in this context consists of human values, norms, and design requirements, inspired by Van de Poel (2013)

2.1.3. Shortcomings of VSD

It is important to acknowledge that VSD comes with its own set of limitations and challenges. Firstly, VSD can be a demanding process in terms of time and resources, necessitating in-depth engagement with stakeholders and thorough elicitation of values. Secondly, implementing VSD in practical scenarios can be complex, as it often involves navigating a landscape of diverse and occasionally conflicting values and design requirements (Van de Poel, 2013). Another significant limitation is that while VSD may offer solutions to conflicting values, it does not inherently include mechanisms for monitoring, evaluating, or measuring the effectiveness of these solutions, which is crucial for ongoing improvement and relevance. It carries the challenge of anticipating the impact of technologies that themselves cannot be fully anticipated due to their emergent and dynamic nature (De Reuver et al., 2020).

In order to address the limitation of VSD not inherently including monitoring, evaluation, or measurement of its solutions, it is suggested to expand the application of VSD iteratively throughout the entire life cycle of these platforms. This extended use of VSD will enable consistent observation of any unintended value impacts and facilitate necessary technological modifications (Umbrello & Van de Poel, 2021). This approach is particularly important due to the inherent uncertainties that come with introducing new technologies into society, such as with social media platforms and their dynamic character (Van de Poel, 2015). However, the design requirements proposed in this thesis for enhancing mental well-being through social media platforms are inherently speculative - the actual real-life impact and appearance of these strategies remain unobserved due to the hypothetical nature of the proposals. This is due to collaboration between academics and major tech companies being hindered by the companies' concerns over confidentiality, which limits the opportunity to test and refine these interventions in a practical setting (Stray & Hadfield, 2023). Furthermore, due to this thesis' limited time frame, building potential prototypes containing the proposed interventions is also not possible.

2.2. Research design

This section outlines the research methodologies employed in this study in order to answer the research sub-questions. As previously introduced in the first chapter, the sub-questions that this thesis aims to address are as follows:

SQ1: *"What are the most relevant design features of popular social media platforms that significantly influence users' mental well-being?"*

SQ2: *"What values are at stake when it comes to the design of social media platforms and its effect on mental well-being?"*

SQ3: *"What interventions could be integrated into the design of social media platforms that aim to enhance users' mental well-being?"*

2.2.1. Selecting sources

This section details the types of sources that will be incorporated into this research in order to answer each of the research sub-questions. The chosen research methods for this study are qualitative in nature. VSD has not previously been applied to social media platforms in the context of mental well-being, giving this project an exploratory character in this aspect. Instead of relying on statistical validation for the sub-questions, the research prioritizes opinions, statements, and assumptions to expand the current application of the framework. The data required for answering these questions falls into distinct categories. Firstly, data will be drawn from existing literature. Another type of data, assumed to be unavailable in written literature, pertains to stakeholder opinions on potentially unfamiliar topics. It is presumed that stakeholders may not have previously engaged in discussions about underlying values. As a result, existing written literature may not provide adequate or significant insights into these stakeholders' perspectives on core values regarding social media use and mental well-being.

Literature review

Literature studies primarily serve to organize and synthesize existing knowledge rather than to discover new information. In this research, a literature study is utilized to consolidate scientific knowledge regarding the theories and applications of VSD, as detailed in the previous sections of this chapter. Additionally, to address the first sub-question of the research, a literature review is conducted. This review is vital for understanding the key design features of popular social media platforms that significantly influence young adults' mental well-being. By examining existing literature, the study aims to identify both beneficial and problematic design features of social media platforms, which will be discussed in chapter 3. This understanding is crucial for developing interventions that can improve the user experience on social media platforms, aligning with the primary goal of fostering a more positive mental health environment for young adults.

Moreover, the literature analysis will be instrumental in constructing a conceptual list of mental well-being values as part of the conceptual investigation phase in VSD. This step is essential for identifying and understanding the conflicts and interactions among different values, setting the stage for a more thorough exploration in the empirical investigation phase.

Semi-structured interviews

While various methods exist for analyzing written texts, only two research methods - surveys and stakeholder interviews - are deemed appropriate for garnering insights into stakeholder opinions on unfamiliar topics like VSD. However, in order to answer research sub-questions two and three, face-to-face interviews are preferred over surveys. Face-to-face interviews provide the flexibility to tailor each discussion to align with the stakeholder's background. Unlike surveys, where questions are predetermined and rigid, interviews offer the adaptability to steer conversations towards the most informative content.

Focus group

Next to expert interviews, a focus group will be conducted in order to answer research sub-questions two and three. Focus groups involve structured group discussions where participants can express their views and interact with each other, offering detailed data. This interactive setting is particularly suited for exploring the nuanced values of users on the design of social media platforms and their impact on mental well-being. The group setting encourages participants to build on each other's responses, leading to a deeper understanding of user opinions, preferences, and considerations regarding mental well-being in the context of social media design.

2.2.2. Research overview

The following diagram displays an overview of the research conducted in this thesis. It summarizes the research sub-questions, along with the respective research methodologies and to which VSD phase they correspond. Furthermore, per research question it can be seen in which chapter they are covered.

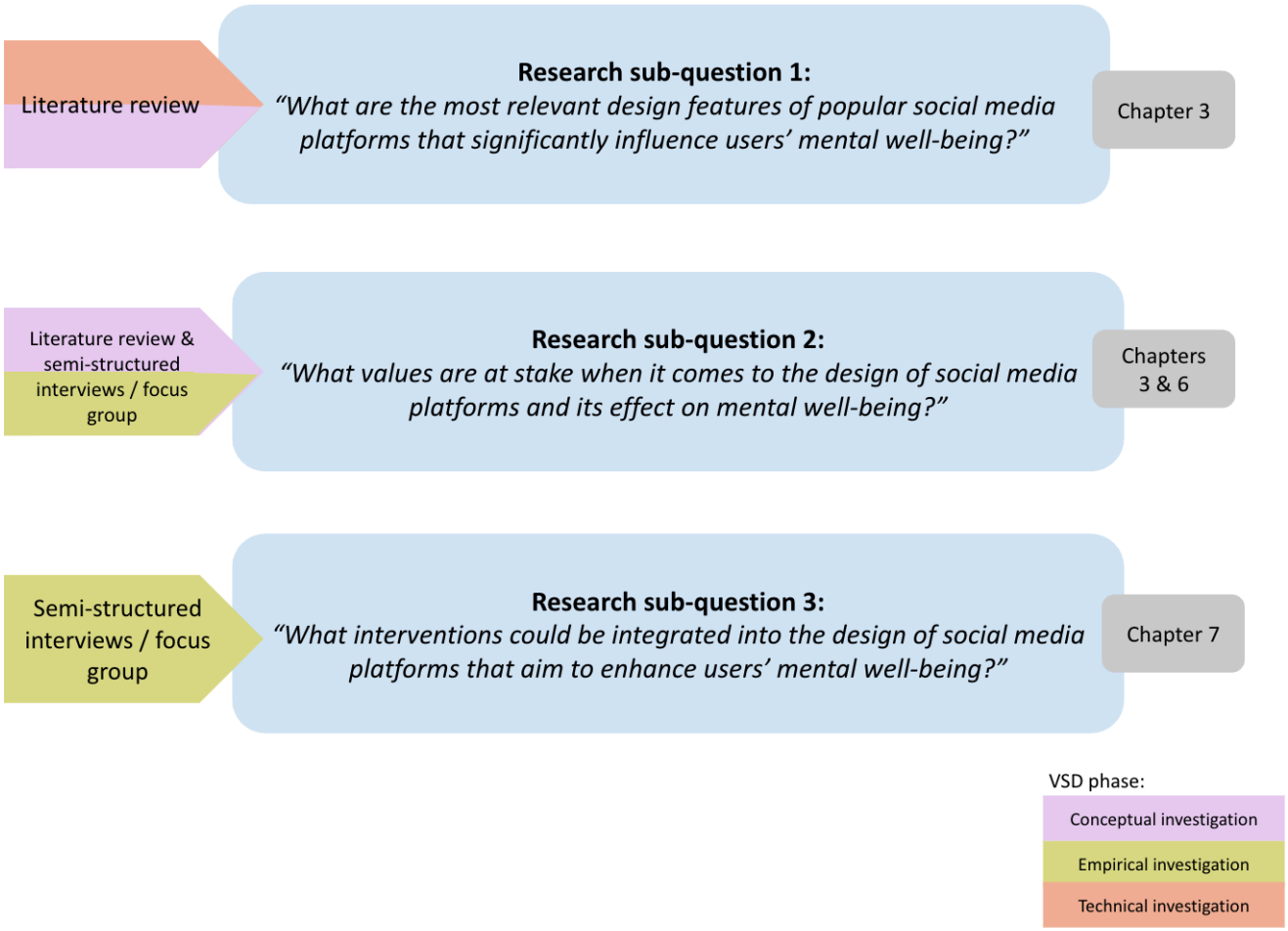

Figure 2.4: Diagram of research overview

2.3. Conclusion research approach

This chapter outlines the analytical framework for this thesis, focusing on Value Sensitive Design (VSD) as a method for integrating ethical values into technology design. It discusses VSD's tripartite methodology — conceptual, empirical, and technical investigations — to ensure technology reflects important human values. Furthermore, creating a values hierarchy is discussed, where the aim in this thesis is to create a hierarchy of values through both top-down and bottom-up approaches related to mental well-being in the context of social media platforms. This will be done through translating these values into concrete design requirements through interventions with design features.

Furthermore, this chapter details selecting qualitative research methods due to the exploratory nature of applying VSD in this context, and choosing sources that include both direct and indirect stakeholders. It discusses employing a literature analysis to identify key design features affecting mental well-being, semi-structured interviews to gather stakeholder opinions, and focus groups to delve into user perspectives on social media design. This comprehensive approach aims to inform design requirements from interventions utilizing design features that enhance mental well-being on social media platforms.

3

Social media platforms

This chapter aims to find an answer to research sub-question 1, as well as setting the context for the analysis, and providing a list of conceptual values as part of VSD's conceptual investigation. The chapter starts by defining social media, focusing on the most popular social media platforms amongst young adults. Then, the definition of mental well-being is operationalized in terms of values based on an article by Orth et al. (2022). The effect of social media on mental well-being is further explored, highlighting the need for understanding which design features affect mental well-being and in what manner. Lastly, the design features are systematically gathered and analyzed, focusing on the concept of affordances and the potential mental well-being values they impact (Davis & Chouinard, 2016; Maier & Fadel, 2009).

3.1. Defining social media

According to the Merriam-Webster dictionary, the first known use of the term ”social media” was around 2004, defined as ”forms of electronic communication through which users create online communities to share information, ideas, personal messages, and other content” (Merriam-Webster, n.d.). While social media platforms have technically existed since the late 1970s, it was not till the mid 2000s when they gained mainstream popularity, primarily caused by platforms such as MySpace, Facebook, and YouTube. The popularity of social media continued to grow as more people joined these platforms and as the platforms themselves evolved with new features and functionalities (Maryville University, 2020). Social media has become an integral part of how people communicate, share information, and connect with one another in the digital age.

When it comes to defining the term ”social media”, there are a number of factors which may make the definition vague, due to the dynamic and ever-evolving nature of online platforms. Social media consists of a wide spectrum of digital spaces, each with its unique features and purposes, from text-based communication to image and video sharing. These platforms often blur the lines between social media, content sharing, and messaging, making it challenging to provide a concise definition. For example, White and Miller (2022) refer to social media as online platforms that allow users to create and share content, connect with others, and engage in social interactions. Similarly, Hall et al. (2020) define social media as ”internet-based platforms that allow users to create, share, or exchange information, opinions, and content, as well as to participate in social networking”. In an article by Boyd and Ellison (2007), the given definition of social media is more detailed, namely as ”web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system”. Other literature give similar definitions of social media, from which it can be concluded that social media is a multifaceted concept consisting of various online platforms and services that enable users to create and share content, engage in social interactions, and often participate in social networking. These platforms facilitate the exchange of information, opinions, and content among users and typically involve the construction of public or semi-public user profiles.

3.2. Major platforms

Social media platforms have emerged as pivotal spaces for communication, entertainment, and information exchange. These platforms, each with their unique features and user communities, have redefined how we connect and interact in the virtual world. the following list gives the most popular social networks worldwide as of October 2023, which have been ranked by number of monthly active users (Dixon, 2023):

1. Facebook - 3 billion users
2. YouTube - 2.5 billion users
3. WhatsApp - 2 billion users
4. Instagram - 2 billion users
5. WeChat - 1.3 billion users
6. TikTok - 1.2 billion users
7. Facebook Messenger - 1 billion users
8. Telegram - 0.8 billion users
9. Snapchat - 0.75 billion users

In this research, it is important to clarify the scope of the focus. While messenger services like WeChat and WhatsApp are also considered social media platforms, they will be excluded from this analysis. The rationale behind this decision lies in the differences in functionality and user interaction these platforms offer compared to traditional social media platforms like Facebook and Instagram. Messenger services primarily facilitate private, direct communication between users, whereas platforms like Facebook and Instagram are designed for broader, more public content sharing and engagement.

Furthermore, the list presents the most popular social media platforms worldwide, but this does not represent the most popular social media platforms amongst young adults. In a study conducted by Pew Research Center (Auxier & Anderson, 2021), the most popular platforms used specifically amongst young adults aged 18-24 contains a different order of social media platforms. The usage of these social media platforms varies significantly across different age groups. For example, while a substantial 65% of adults aged 18 to 29 report using Snapchat, this figure dramatically drops to a mere 2% among those aged 65 and older. The following list is an overview of the most popular social media platforms amongst young adults in ranking order (Auxier & Anderson, 2021):

1. YouTube
2. Instagram
3. Facebook
4. Snapchat
5. TikTok
6. X (formerly Twitter)

While YouTube dominates in terms of overall user reach, other platforms, particularly Instagram, Snapchat, and TikTok, hold significant appeal among young adults. Notably, a substantial majority of individuals aged 18 to 29 report using Instagram (71%) and Snapchat (65%), with about half indicating they use TikTok (55%) (Auxier & Anderson, 2021). While YouTube and Facebook have a broader user base, Instagram, Snapchat, and TikTok have a more concentrated following among young adults. This demographic specificity makes these platforms more relevant for studying the mental well-being of young adults, as they are the primary users.

3.3. Defining mental well-being

Defining mental well-being is a complex task as it encompasses an all-round array which contributes to an individual's overall mental health and quality of life. In a paper by Schønning et al. (2020), the complexity of defining and measuring mental health and well-being is highlighted. The paper defines mental health and mental well-being in various ways, depending on the studies included in the scoping review. For example, some studies define mental well-being as the absence of mental illness, while others define it as a positive state of well-being. Similarly, some studies define mental well-being as happiness, while others define it as a combination of positive emotions, life satisfaction, and a sense of

purpose (Schønning et al., 2020). In an article by Meier and Reinecke (2020), mental health is defined as ”more than the absence of mental disorders, but a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community”.

Given this divergent range of defining mental well-being, even in philosophy different theories of well-being are given, which are either hedonist theories, desire theories, or objective list theories. Hedonist theories equate well-being with the experience of pleasure or happiness, while desire theories define well-being in terms of the satisfaction of an individual's desires. On the other hands, objective list theories propose that well-being consists of a variety of specific elements or goods that are valuable in and of themselves (Crisp, 2021). According to philosopher T.M. Scanlon, who holds an objective list view, a unifying theory of well-being is unlikely to be attainable. He suggests that the factors contributing to well-being are highly dependent on individual contexts and personal circumstances. This implies that what constitutes well-being can vary significantly from person to person and situation to situation, making it difficult to develop a universal theory. Scanlon further suggests that certain values or elements are indeed constituents of well-being. In other words, while he may not provide a systematic framework or hierarchy for these elements, he acknowledges that they play a role in constituting well-being (Crisp, 2021). Given that mental well-being is a complex concept, the objective list theory naturally accommodates this complexity by allowing for a range of different elements or factors that contribute to well-being. This aligns well with the understanding that mental well-being is not just about the absence of mental illness but includes various aspects of mental health. Furthermore, this approach also allows for contextual adaptability, which is helpful when trying to find values related to mental well-being and social media use, as social media has a constantly changing nature. An adaptable approach to well-being can incorporate these changes, understanding how new aspects of social media usage impact mental well-being, as well as ensuring that technology design does not overlook less apparent but significant impacts on various groups.

For a comprehensive understanding of well-being in relation to a system like social media, it must be accurately modeled and measured (Kross et al., 2021). This involves not only theoretical considerations but also methodological ones. The issue with traditional well-being assessment tools is that they might not adapt well to contexts that are transforming quickly, such as those impacted by novel technologies (Van der Maden et al., 2023). These traditional tools aim for consistency but may fail to capture the dynamic nature of well-being in these rapidly evolving environments. Liscio et al. (2021) propose that obtaining a methodology for obtaining relevant contextualized values in rapidly changing environments such as social media platforms is crucial. To create measures of well-being that are sensitive to specific contexts, it is essential to maintain ongoing engagement with the community. This process involves regularly reviewing and revising the tools used for evaluating well-being in these particular contexts; however, sources recognize that an ideal strategy for this purpose is still not fully developed (Van der Maden et al., 2023). As a starting point for this research, and in order to operationalize the definition of mental well-being during the analysis of this research, a list of conceptual values will be used, as it is in line with the conceptual investigation of VSD. Both objective list theory and VSD recognize that values and definitions of well-being are not static but evolve over time and across contexts.

The values used as an initial contextualization of mental well-being come from an article by Orth et al. (2022), which is a systematic review of literature on existing mental well-being instruments published between 2000 and 2020 in order to pinpoint operational definitions of mental well-being concepts. Likewise to Meier and Reinecke (2020), Orth et al. (2022) recognize that mental well-being encompasses more than the absence of mental illness and should include indicators of mental well-being. The reason why this paper is chosen is because it is already a synthesized review of mental well-being instruments, significantly streamlining the research process by consolidating extensive analyses into a singular, accessible source. Furthermore, because mental well-being is broken down into a list of values, it allows for adaptability in applying mental well-being to the context of social media platforms. As a result of their review, a list of 24 values have been ranked and formulated in relation to mental well-being. These values are beneficial for this research as it provides an analysis of mental well-being instruments from the past two decades, capturing the evolving nature of mental well-being values over time but also ensuring that this research is grounded in a wide range of validated measures and contemporary perspectives in the field. An overview of the 24 values is given in table 3.1. These mental well-being values will be drawn upon in the analysis chapters 5 and 6.

Table 3.1: A list of values related to mental well-being, as part of the conceptual investigation (Orth et al., 2022)

Mental well-being values			
Connection	Life satisfaction	Self-acceptance	Resilience
Happiness	Personal growth	Environmental mastery	Social contribution
Hope	Autonomy	Engagement	Social coherence
Purpose	Physical functioning	Mindfulness	Social actualization
Self-efficacy	Self-esteem	Coherence	Social acceptance
Personal expressiveness	Coping	Self-control	Perseverance

3.4. Effect on mental well-being

The effect of social media on the mental well-being of young adults is difficult to isolate. While social media can offer valuable opportunities for social connection, information sharing, and support, it also presents potential challenges. As mentioned by White and Miller (2022), an increasing number of empirical research has established links between social media use and the indication of addiction and depressive symptoms. There is a prevailing sense that social media platforms may distort our perception of reality, foster feelings of low self-esteem, and erode overall life satisfaction - feelings broadly acknowledged and shared among a significant portion of the population. Even certain former influencers have turned critical of social media, highlighting the danger of crafting a self-image that is far from reality. In response, several platforms have initiated experiments with design interventions aimed at safeguarding users' mental well-being, including measures such as limiting the visibility of "likes" on posts (White & Miller, 2022).

The question arises what it is about social media platforms that causes users to experience negative effects on mental well-being. Burr et al. (2020) discuss the lack of theoretical and empirical understanding of the goals of well-being, which is one of the most important gaps identified in the literature. This gap could result from, among other things, uncertainty about the causal relationship between the use of social media platforms and a psychological effect (e.g., increased anxiety or depression). While it is true that many articles claim that social media negatively affects mental well-being, the causal relationship between social media use and mental health is still uncertain due to several reasons. One reason is that the studies on this topic often rely on self-reported data, which may be biased or incomplete. Another reason is that the relationship between social media use and mental health is complex and contains many facets, and it is difficult to isolate the effects of social media use from other factors that may contribute to mental health problems. Finally, there is a lack of consensus on how to define and measure mental well-being, which makes it difficult to compare and generalize findings across studies (Burr et al., 2020). Picking up on the latter reason, namely defining mental well-being, in section 3.3 it was concluded that mental well-being's definition is context dependent, and for this research has been operationalized in the terms of values found in table 3.1.

While design features of social media platforms are not the only factors contributing to adverse impacts on mental well-being, numerous articles highlight their significant role in the issue. White and Miller (2022) mention that design features of social media can affect mental well-being. It is argued that social media platforms are designed to maximize engagement and that this can have a corrosive effect on the mental health of users. They suggest that design features such as notifications, likes, and infinite scrolling can contribute to feelings of addiction and anxiety, and that the constant stream of information and social comparison can lead to feelings of inadequacy and low self-esteem. Furthermore, Buchi and Hargittai (2022) also discuss the role of design features of social media in affecting mental well-being. For example, they cite research that suggests that certain design features of social media platforms, such as the use of likes and comments, can have both positive and negative effects on users' emotional and psychological well-being. On the one hand, receiving likes and positive feedback can boost users' self-esteem and sense of social connectedness. On the other hand, the pressure to present a curated and idealized version of oneself on social media can lead to feelings of anxiety, social comparison, and FOMO (fear of missing out), which can negatively impact users' mental health. The article also notes that social media algorithms, which are designed to maximize user engagement and attention, can contribute to the spread of misinformation, polarization, and online harassment, which can further harm users' well-being.

While research suggests a correlation between social media's design features and mental health concerns, a clear overview and understanding of which platform design features directly impact these

issues remains to list (Buchi & Hargittai, 2022; Montag et al., 2019; Ong & Lee, 2022; White & Miller, 2022). The next section aims to address this gap by systematically gathering and analyzing information about various design elements of social media platforms. By identifying and understanding these design features, this research seeks to clarify their roles in either exacerbating or alleviating mental well-being challenges, thereby contributing to a more nuanced understanding of the relationship between social media design and mental well-being, allowing for actionable interventions to be recommended during the formulation of design requirements.

3.5. Design features

In order to systematically gather and analyze different design features of social media platforms and identify the most impactful ones on mental well-being, a literature review is to be conducted. This is done in three phases; searching for, screening, and selecting relevant literature.

Searching

The research begins with a literature review on the impact of social media platforms on the mental well-being of young adults, utilizing the database Google Scholar. Table 3.2 outlines the primary keywords selected to refine the research focus and identify relevant studies. As the literature review progressed, additional related keywords were incorporated into the table. At the same time, while reading several articles, synonyms came to light which are in line with the keywords. The keywords were combined using the Boolean operators ”AND” and ”OR” to enhance the search strategy and refine the results.

Table 3.2: Key words and their respective synonyms used during the searching phase

Key word(s)	**Synonyms**
Mental well-being	Mental health, mental state, digital well-being
Social media	Social media platfoms, virtual space, digital space
Design features	Design elements, design components, interface characteristics
Impact	Effect, influence
Young adults	Adolecents, early adults

Screening

During the initial screening, articles focusing on specific aspects of mental well-being, such as psychological well-being or subjective well-being, were excluded to ensure the research encompassed mental well-being in its entirety, without limiting the scope to particular dimensions or interpretations. Additionally, articles that discussed design features without detailing their specific impacts were likewise eliminated from consideration. The primary sources include five academic articles specifically exploring the relationship between social media design and mental well-being. Furthermore, the review incorporates a study from the Pew Research Center which offers valuable insights into broader trends and patterns in social media’s impact on mental health, providing a contextual backdrop for the academic findings (Vogels et al., 2022). Moreover, using the backward snowballing method on the initial article references led to the discovery of one additional relevant source. This includes a specialized website that discusses design interactions responsible for the social media mental health crisis. This website, considered as grey literature, was selected for its practical and applied focus, offering a real-world perspective on how design features in social media platforms contribute to mental health issues.

Selecting

Table 3.3 gives an overview of the selected sources in order to find the design features that affect mental well-being. The sources were then analyzed for which design features are mentioned to have an impact on mental well-being, and are shared amongst each of the most common social media platforms mentioned in section 3.2. These features are noted down in table 3.4, along with a description and the sources mentioning the features.

Table 3.3: Literature used for overview design features

Author(s)	Year	Title
Beyari, H.	2023	The Relationship between Social Media and the Increase in Mental Health Problem
Chancellor, S., De Choudhoury, M.	2020	Methods in predictive techniques for mental health status on social media: a critical review
Montag, C., Lachmann, B., Herrlich, M., Zweig, K.	2019	Addictive Features of Social Media/ Messenger Platforms and Freemium Games against the Background of Psychological and Economic Theories
Li, L., Romero-Hall, E., Petersen, E.	2020	Most versus least used social media: undergraduate students' preferences, participation, lurking, and motivational factors
White, B., Miller, M.	2022	Filtered States: Active Inference, Social Media and Mental Health
Vogels, E.A., Gelles-Watnick, R.	2023	Teens and social media: Key findings from Pew Research Center surveys
Circ Cular	2023	9 Design Interactions Responsible For The Social Media Mental Health Crisis

Table 3.4: Common design features found to have an impact on mental well-being

Feature	Description	Sources
News feed	Presents a continuous stream of updates from friends, followed accounts, advertisers, and algorithmically suggested content	(Montag et al., 2019) (Beyari, 2023) (Hall et al., 2020) (White & Miller, 2022) (Vogels et al., 2022)
Interactive features	Includes likes, comments, shares, follow, and reactions, which serve as immediate feedback mechanisms for shared content	(Chancellor & De Choudhury, 2020) (Montag et al., 2019) (Beyari, 2023) (Hall et al., 2020) (White & Miller, 2022) (Vogels et al., 2022) (Circ Cular, 2023)
Notifications	Designed to alert users about interactions, keeping them engaged with the platform	(Hall et al., 2020) (White & Miller, 2022) (Vogels et al., 2022) (Circ Cular, 2023)
Direct messages (DMs)	Allows for private conversations	(Chancellor & De Choudhury, 2020) (Beyari, 2023) (Hall et al., 2020) (Vogels et al., 2022) (Circ Cular, 2023)
Algorithmic recommendations	Tailored to enhance user engagement, algorithmic recommendations present content that aligns with a user's past behavior, preferences, and personal information	(Montag et al., 2019) (White & Miller, 2022) (Vogels et al., 2022) (Circ Cular, 2023)
Privacy settings	User-controlled options that allow individuals to manage who can see their content, interact with them, and access their personal information	(Montag et al., 2019) (Vogels et al., 2022)
Groups and communities	Dedicated spaces where users with common interests or backgrounds can connect, share, and interact with each other	(White & Miller, 2022) (Hall et al., 2020) (Circ Cular, 2023)
Multimedia integration	Features like photo and video filters, GIFs, stickers, and AR effects enhance content creation	(White & Miller, 2022) (Vogels et al., 2022) (Circ Cular, 2023)

In order to have a structured approach to understanding and analyzing how design features of social media platforms influence mental well-being, the design features will be categorized as affordances. An affordance is defined as ”the range of functions and constraints that an object provides for, and places upon, structurally situated subjects” (Davis & Chouinard, 2016). In the context of social media, affordances refer to the functions, possibilities, and limitations that the design of a platform offers to its users. The relationship between users and the platform is dynamic. As users interact with various features, their experiences and behaviors can change over time. This aligns with the concept of affordances being a dynamic link between subjects (users) and objects (features of social media) (Davis & Chouinard, 2016). Furthermore, understanding the affordances per design features can serve as a guide to formulating design requirements that are in favour of mental well-being.

There are several academic articles available that either describe how to list affordances or offer a framework to do so. While the end-goal is the same in each of these articles (listing affordances), the approach in doing so tends to differ per article (Davis & Chouinard, 2016; Maier & Fadel, 2009; Ostern & Rosemann, 2021; Reviglio, n.d.). The chosen methodology for listing the affordances closely aligns with the methodology highlighted by Maier and Fadel (2009), who propose a relational theory of design in order to explain the connections between designers, users, and artifacts. The methodology start with defining what an affordance is - possibilities for action that an object or environment offers to an individual. In the context of this research, these are the design features that enable or encourage users to perform certain actions or behaviors. Then, for each of the previously defined design features, the type of action or behavior it affords on mental well-being is to be explained. The methodology highlights that these steps are necessary in order to determine ”negative affordances” - an affordance which is potentially harmful - in order to be able to propose design recommendations that counteract the negative affordances (Maier & Fadel, 2009). This is particularly helpful during the formulation of VSD’s design requirements, as it facilitates the identification of key values within these connections. As such, for each design feature, the affordance will be explained, as well as the potential impact per feature on mental well-being.

News feed

- **Affordance:** The news feed in social media platforms affords users the ability to access a continuous stream of information. This includes updates from friends, followed accounts, advertisements, and algorithmically suggested content. The design feature primarily affords the actions of browsing, consuming, and interacting with content (Vogels et al., 2022).
- **Effect on mental well-being:** The personalized nature of the news feed, driven by algorithms, can create filter bubbles and echo chambers, potentially leading to the reinforcement of existing beliefs and the spread of misinformation, which can have negative effects on mental well-being. Additionally, Hall et al. (2020) highlight concerns about the potential for social comparison and feelings of inadequacy that may arise from viewing carefully curated and often idealized content in the news feed, which could either come from ”influencer” accounts users follow, as well as their close friends. Furthermore, the potential for excessive use of the news feed can contribute to issues such as social isolation and reduced emotional support, which can also affect mental well-being. The constant stream of information, primarily due to endless scrolling, can create a sense of anticipation and the potential for near-endless novelty (White & Miller, 2022). Endless scrolling leads to content continuously loading as the user scrolls down, creating an environment that encourages prolonged engagement on the platform without a natural stopping point. Additionally, White and Miller (2022) suggest that ongoing and consistent engagement with inauthentic content on social media platforms can lead to the pinning of expectations in place, potentially affecting users’ predictive systems and their ability to flexibly adjust expectations in the face of real-world evidence. This, in turn, can contribute to symptoms of depression and impact mental well-being.

Interactive features

- **Affordance:** Interactive features on social media platforms, such as likes, comments, shares, follows, and reactions, afford users the ability to provide and receive immediate feedback on shared content. This design feature primarily affords the actions of engaging, validating, and connecting with others (Montag et al., 2019).
- **Effect on mental well-being:** Interactive features on social media platforms, such as likes, comments, shares, follows, and reactions, significantly influence mental well-being through various mechanisms. These features create a feedback loop that drives user engagement, but delays in social feedback can lead to uncertainty and affect mental health (White & Miller, 2022). The nature of these interactions, such as the like button, can elevate social status, yet their absence can also lead to emotional dysregulation and cognitive distortions, as well as create illusions of social rejection (Circ Cular, 2023). The neuroscientifically proven power of positive social feedback mechanisms, such as likes or reactions, is notable, but they also contribute to addictive behaviors and reinforce social comparison and reward mechanisms (Montag et al., 2019). While these interactive features enhance content visibility and the dynamics within online communities, they can also contribute to social comparison, self-esteem issues, while at the same time facilitate positive interactions and social support.

Notifications

- **Affordance:** Notifications on social media platforms are designed to alert users about various interactions, such as likes, comments, or new content from followed accounts. This feature primarily affords the actions of prompting engagement and maintaining user connection with the platform.
- **Effect on mental well-being:** Notifications on social media platforms, particularly those related to social validation like follows, reactions, or replies, play a complex role in affecting mental well-being. These notifications can produce dopamine hits, creating an illusion of social rejection when absent, and their intermittent nature serves as a strategy to retain user attention (Circ Cular, 2023). For teens, the impact is pronounced, with many feeling pressured to respond immediately and experiencing anxiety or stress when notifications are absent. This constant stream can lead to feelings of overwhelm and contribute to addiction-like behaviors (Vogels et al., 2022). Moreover, the design of notifications, with enticing visual and auditory cues, triggers alert and compulsive behavior. Features like shining buttons or exciting sounds prolong the anticipation of discovering the nature of incoming content, intensifying the user's engagement with the platform. The use of smartphones amplifies this effect, making the alertness from notifications more intermittent and impacting mental states (White & Miller, 2022). Notifications also significantly shape user engagement and behavior. They act as prompts for users to return to the platform and interact with content, influencing attention and the overall user experience. However, excessive or intrusive notifications can lead to negative consequences such as distraction, information overload, and addiction-like behaviors (Hall et al., 2020). While notifications provide valuable updates and help maintain social connections, they can also contribute to stress and reduced productivity, exemplifying their double-edged nature.

Direct messages (DMs)

- **Affordance:** Direct messages on social media platforms afford users the ability to engage in private conversations. This feature primarily facilitates personal interactions, differing from the public nature of other social media interactions.
- **Effect on mental well-being:** Direct messages serve as vital channels for private communication and interactions, often contributing positively to social support and interpersonal relationships (Hall et al., 2020). This aspect of direct messaging can lead to enhanced mental well-being by fostering meaningful connections and providing a platform for private, supportive exchanges. However, it can also act as a rapid vehicle for cyberbullying, with negative comments and directed abuse posing mental health risks. Despite clear anti-bullying stances by many social networking sites, the effectiveness of addressing these issues remains a concern (Circ Cular, 2023). Furthermore, the pressure to respond immediately to direct messages can be overwhelming for some users, particularly teens. This urgency can lead to feelings of anxiety, stress, and even contribute to addictive behaviors, particularly when the influx of messages is constant. Conversely, not receiving direct messages can also induce stress and feelings of social exclusion (Vogels et al., 2022).

Algorithmic recommendations

- **Affordance:** Algorithmic recommendations on social media platforms afford the personalization of user experience by presenting content that aligns with a user's past behavior, preferences, and personal information. This feature primarily facilitates tailored content delivery, aiming to enhance user engagement.
- **Effect on mental well-being:** Algorithmic recommendations can contribute to the addictive nature of social media by creating a personalized and potentially endless stream of content. This tailored content can lead to prolonged and habitual use, raising concerns about its implications for mental health. The personalized nature of these recommendations often results in a "filter bubble" effect, where users are exposed predominantly to content that reinforces their existing beliefs and opinions, potentially contributing to polarization and social division (Montag et al., 2019). The constant exposure to tailored content can lead to a never-ending chase for pleasure, potentially depleting dopamine levels and elevating anxiety and depression (Circ Cular, 2023). This effect is fueled by cognitive distortions and a modified reality, as users are frequently presented with content that echoes their views, reinforcing existing biases and sometimes spreading misinformation

through engagement driven by bots and algorithmic manipulation (Circ Cular, 2023). Furthermore, the invisible nature of these algorithmic ranking systems, which learn and adapt to users' habits and preferences, plays a crucial role in feeding addiction and maintaining user engagement. By showing users what they want to see, these systems keep them hooked, leading to potential cognitive distortions and contributing to mental health issues (Circ Cular, 2023).

Privacy settings

- **Affordance:** Privacy settings on social media platforms afford users the ability to control who can see their content, interact with them, and access their personal information. This feature primarily facilitates the management of personal boundaries and information disclosure on social media platforms.
- **Effect on mental well-being:** While teens seem to display a lack of worry about the amount of personal information available to social media companies, the sharing of personal information can lead to privacy breaches, identity theft, and exposure to online harassment or cyberbullying, all contributing to negative effects on mental well-being (Vogels et al., 2022). Furthermore, the collection and utilization of this data by social media platforms can lead to feelings of vulnerability and a diminished sense of control over personal information (Montag et al., 2019). This situation not only impacts users' sense of security and privacy but also contributes to the addictive nature of social media. By personalizing content and recommendations based on collected data, these platforms enhance user engagement, potentially leading to prolonged usage and its associated effect on mental health (Montag et al., 2019).

Groups and communities

- **Affordance:** Groups and communities on social media platforms afford users dedicated spaces to connect, share, and interact with others who have common interests or backgrounds. This feature primarily facilitates specific engagement, community building, and targeted information exchange.
- **Effect on mental well-being:** Groups and communities on social media platforms can provide a sense of belonging and social support, contributing positively to mental health by fostering connections and support, especially for individuals who might feel isolated or marginalized (Circ Cular, 2023). However, these groups also have the potential to spread misinformation, polarizing content, and contribute to negative mental health outcomes, such as cyberbullying, pressure to conform, and exposure to harmful content (Circ Cular, 2023; White & Miller, 2022). Moreover, understanding the dynamics within online communities, such as the role of lurkers —individuals who observe but do not actively contribute — is crucial. Lurkers, who often form the majority in these communities, may have various reasons for their passive participation, ranging from poor online communication skills to a desire for privacy. While traditionally seen as passive or non-participative, lurking can be a strategic and valuable form of online behavior, allowing users to remain connected while maintaining their privacy (Hall et al., 2020).

Multimedia integration

- **Affordance:** Multimedia integration on social media platforms, encompassing features like photo and video filters, GIFs, stickers, and AR effects, affords users enhanced content creation capabilities. This feature primarily facilitates creative expression and personalization of content.
- **Effect on mental well-being:** These features, while enhancing content with creativity and personalization, can lead to negative mental health outcomes, such as body image issues and body dysmorphic disorder. The use of beautifying filters, in particular, has raised concerns about their effects on self-esteem and body image, especially among young people (Circ Cular, 2023). The pursuit of idealized beauty standards, often propagated by such filters, can contribute to unrealistic expectations and body dysmorphic disorder, a concern highlighted by the trend of individuals seeking cosmetic surgery to mimic appearances in filtered images (Circ Cular, 2023). Furthermore, the allure of these multimedia tools can also contribute to the addictive nature of social media. The personalized and engaging nature of content created with these features encourages prolonged and habitual use of the platforms. This extended engagement can potentially lead to addictive behaviors and a shift in focus away from real-world interactions, affecting overall mental well-being (White & Miller, 2022).

3.6. Conclusion social media platforms

In this chapter, how design features of social media platforms influence mental well-being is explored by firstly defining mental well-being. Here it is stated that mental well-being is context dependent, and given the dynamic nature of social media platforms, the definition of mental well-being is operationalized in terms of values, which are found in table 3.1. The analysis extends to key features of social media platforms which have a significant impact on mental well-being, which are found to be the news feed, interactive features, notifications, direct messages (DMs), algorithmic recommendations, privacy settings, groups and communities, and lastly multimedia integration.

These design features are then explored in the concept of affordances. Affordances, as defined by Davis and Chouinard (2016), are the range of functions and constraints that an object offers to structurally situated subjects. In the context of social media, they refer to the functionalities, possibilities, and limitations offered by a platform's design to its users. This concept underscores the dynamic relationship between users and the platform, evolving as users interact with various features.

The methodology for categorizing and analyzing these affordances aligns with Maier and Fadel (2009), who propose a relational theory of design. For each of these design features, its affordance and potential impact on mental well-being is explained. This structured approach to understanding the influence of social media design features on mental well-being is essential for developing design requirements that promote positive mental health outcomes.

Next step

Now that the critical design features affecting mental well-being have been identified, the next step involves examining potential interventions utilizing these features. This examination includes a detailed look at the interventions Dime has incorporated into their social media platform's design for each of these features, a subject that will be delved into more deeply in section 4.3.

Furthermore, it is still unclear which values are actually at stake when it comes to the design of social media platforms and its effect on mental well-being (research sub-question 2). Before delving into the values, the subsequent chapter will conduct a stakeholder analysis to identify both direct and indirect stakeholders and determine which of them will be selected for the interviews and focus group.

4

Stakeholder analysis

This chapter outlines the stakeholders relevant to the creation and utilization of social media platforms. Then, the interview questions and focus group protocol are discussed, along with an overview of the interviewees and participants. Then, following an interview with one of Dime's founders, each of the design features found in section 3.5 are discussed for Dime, along with what interventions Dime has implemented. These interventions are considered foundational context for this research, which are to be discussed during the expert interviews and focus group.

4.1. Stakeholders

During the conceptual investigation of Value Sensitive Design, the stakeholder analysis identifies both direct and indirect stakeholders related to social media platform design. As mentioned earlier, VSD underscores the importance of engaging with both direct and indirect stakeholders as a crucial aspect of both the design process and the philosophical exploration of values. Direct actors are those who participate actively in the design and usage of social media platforms. In contrast, indirect actors are those who, despite having a vested interest, are not directly engaged in the platforms' design or use. During the literature review in chapter 3, a record of mentioned stakeholders was kept. Stakeholders with similar functions or impacts are grouped together to avoid confusion and overlap, ensuring a clear and comprehensive understanding of all entities involved in or affected by the dynamics of social media platforms.

Social media users

Young adults: This group represents the primary focus of this research. They are active users of social media and their experiences, interactions, and mental well-being are directly influenced by the design features of these platforms. In a study focused on the motivational processes and potential negative consequences of social media use by Throuvala et al. (2019), the following themes emerged on why young adults use social media:

1. Symbiotic relationship with peers: Constant communication and making new friends through social media.
2. Digital omnipresence: The need for control and managing impressions online.
3. Emotional regulation: Using social media to counter boredom, enhance mood, and provide escapism.
4. Self-presentation: Managing online identity and impressions, often idealized.
5. Peer comparison and validation: Seeking social acceptance and validation through social media interactions.
6. Functional communication: Using social media for practical communication, research, and multitasking.

General users: This broader group includes users of all ages and backgrounds.

Social media platform developers (Zenone et al., 2022)

Designers: These professionals are responsible for the visual and interactive elements of social media platforms. They play a crucial role in determining how users interact with the platform and how information is presented.

Developers: These are the technical experts who build, maintain, and update social media platforms. They turn design concepts into functional features.

Product managers: They oversee the development of social media features, while balancing business objectives with user needs. They play a key role in deciding which features are developed and how they align with the platform's goal.

In summary, social media developers are professionals who design, create, maintain, and manage social media platforms and applications. When it comes to the manner of how social media platforms are currently designed, Zenone et al. (2022) argue that the design and purpose of social media platforms themselves are drivers of health outcomes, and that the role of social media platforms and the companies that design them is rarely considered in health research. The business structure of social media platforms dictates their overarching goals and priorities, which in turn shape the needs and preferences of social media developers. Developers are tasked with creating features and designs that align with these business objectives. For instance, if a platform's revenue is ad-driven, developers might prioritize creating tools for advertisers, driving user engagement. Thus, the platform's business model influences the design and development priorities, aligning with the needs and preferences of its developers.

Mental health professionals (Circ Cular, 2023)

Psychologists/psychiatrists: Experts in mental health who can provide insights into the psychological effects of social media use and offer strategies for promoting mental well-being.

Researchers: Academics and scientists who study the effects of social media on mental health. They contribute empirical data and theoretical frameworks to understand these impacts.

Regulatory bodies and policy makers (Circ Cular, 2023)

Government agencies: These bodies are responsible for regulating content and practices on social media to protect users and ensure ethical standards.

Policy makers: Individuals or groups involved in creating policies that govern social media use, focusing on issues like privacy, data protection, and mental well-being.

Industry experts (Circ Cular, 2023)

Social media analysts: These experts study trends, usage patterns, and the broader impact of social media on society.

Technology ethicists: Professionals focused on the ethical implications of technology, including issues of privacy, data use, and the societal impact of social media.

Advocacy groups and NGOs

Mental health advocacy groups: Organizations dedicated to promoting mental health awareness and support. They often highlight the impact of social media on mental well-being.

Digital rights groups: These organizations focus on protecting users' rights in the digital space, advocating for privacy, security, and freedom of expression.

Parents and guardians (Vogels et al., 2022)

Concerned about the impact of social media on their children's mental well-being and development. They seek to understand and manage their children's social media use.

Advertisers and marketers (Circ Cular, 2023)

These stakeholders use social media for marketing purposes. They utilize the platforms' data to precisely target specific demographics, interests, and behaviors. As such, a key metric for both social media platforms and marketers is engagement, as it drives the success of content strategies and advertising campaigns.

Content creators and influencers (Circ Cular, 2023)
Those who create content for social media. They have an impact on user engagement, trends, and the overall culture of social media platforms. This stakeholder group is often reliant on social media platforms as a means of financial income.

The stakeholders have been categorized into a power-interest grid, displayed in figure 4.1. The power-interest grid is an effective method for categorizing stakeholders based on their interest and power in a given issue. This approach segments stakeholders into four distinct groups: 1) *players*, who have both significant interest and power, 2) *context setters*, with high power but minimal interest, 3) *subjects*, who are highly interested but have little influence, and 4) *the crowd*, with low levels of both interest and power (Bryson, 2004).

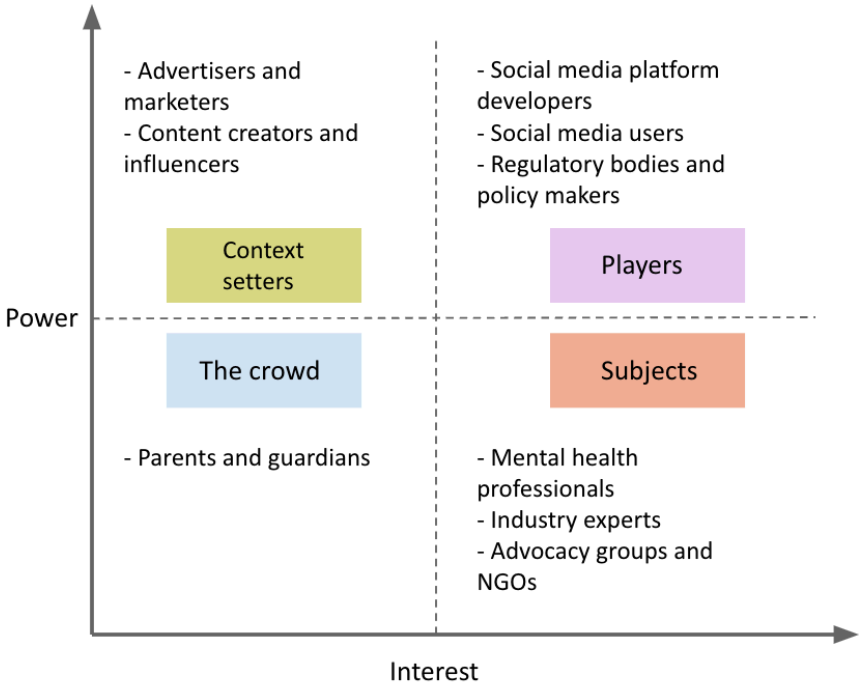

Figure 4.1: Power-interest grid of the stakeholders in the context of social media's effect on mental well-being

4.2. Interviews and focus group

To address research sub-questions two and three, both expert interviews and a focus group will be utilized, with a distinct emphasis on the focus group as the primary source of data. The expert interviews will serve to provide supplementary background information, enriching the context for the design aimed at users. This approach allows for a deep dive into user-centric insights through the focus group, while expert perspectives offer a foundational understanding to inform and support proposed design interventions. The following section outlines what kind of questions were asked during the interviews and focus group to better understand stakeholder values in relation to mental well-being, social media design features, and potential interventions.

4.2.1. Interview questions

As VSD emphasizes the importance of involving both direct and indirect stakeholders, ideally multiple people from each stakeholder group identified in figure 4.1 would be interviewed, yet due to this research's limited time and scope, this is not possible. Instead, the interviewees can be categorized into two distinct groups: those specializing in social media platforms and those in digital well-being/social media & mental health. This dual approach is key to achieving a holistic understanding of the research topic. Table 4.1 gives an overview of the interview respondents.

Table 4.1: Overview interviewees empirical investigation

Interviewee	Expertise
P1	Digital well-being researcher
P2	Social media and mental well-being researcher
P3	Digital interventions researchers
P4	Digital platforms and well-being researcher
P5	Digital platforms and design researcher
P6	Co-founder of novel social media platform ”Dime”

Two channels were used to find the interview experts. Firstly, a public LinkedIn post was created where it was mentioned that social media platform developers and digital well-being experts are needed for this MSc thesis research. The post reached over 2,500 impressions, and experts were found through names recommended by people who saw the post. Furthermore, because VSD is the main analytical framework, the attempt was to also find experts with a background in designing for values. In order to do so, experts were reached out to from the Delft Design for Values Institute, a collaboration between five of TU Delft's faculties, focusing on integrating values into the design process of technologies. On their experts page, people were reached out to who have an expertise in both well-being and digital platforms (Delft Design for Values Institute, n.d.). Potential interviewees from other stakeholder groups such as policy makers and industry experts were also reached out to on LinkedIn, but unfortunately with no response.

Interviews with the platform experts will provide insights into the technical and operational nuances of these platforms. Concurrently, conversations with digital well-being professionals will deepen the understanding of social media's psychological and social effects. This dual strategy ensures a balanced perspective, encompassing both the technical complexities of social media design and the resultant human experiences. The differentiation in questions for each expert group is essential to extract specialized knowledge relevant to their fields. Questions for social media platform experts focus on technical, design, and operational aspects of these platforms, aiming to understand the intricacies of their construction and functioning. On the other hand, questions for experts in digital well-being and mental health are tailored to explore the psychological and social effects of social media usage.

In the semi-structured interview format, the sequence of questions is strategic. Initially, interviewees are questioned about their views on the connection between social media usage and mental health, including the influence of specific design features. Subsequently, a predefined list of these features is presented for further discussion, aiming to assess if interviewees could independently identify relevant features before being guided by the list. The questions then shift to the objectives of social media developers, exploring possible design interventions and recommendations that prioritize mental well-being. Notably, questions directed at platform developers were divided into two segments, encompassing both tailored questions for Dime's co-founder and broader queries for other platform developers. Chapter 4.3 gives a detailed overview of Dime's purpose and design features based on the interview. An overview of the interview questions can be found in appendix B.

The six interviews conducted for the thesis were deemed sufficient as they allowed for reaching a point of data saturation. Through these discussions, recurring themes and insights began to emerge, indicating that additional interviews with similar experts were unlikely to yield fundamentally new information relevant to our research questions. However, it is acknowledged that interviewing additional stakeholders, such as policymakers, could potentially uncover different themes and insights.

4.2.2. Focus group protocol

In this research, Dime, a novel social media platform, will be introduced as a case study in the focus group. This platform was chosen because it incorporates interventions with specific features they claim are aimed at enhancing user mental well-being, making it an ideal case study to explore the effectiveness and impact of such interventions. Furthermore, Dime also addresses a practical consideration: it may be challenging for users to conceptualize hypothetical design interventions within the familiar context of existing social media platforms. Dime, equipped with tangible materials and footage that can be directly presented to users, offers a visual example for discussion. This direct exposure enables participants to better understand and evaluate the design interventions. The insights gained from the discussion about Dime are expected to be generalizable to other social media platforms because the

underlying principles and challenges in designing for mental well-being are likely to be similar across different platforms. By focusing on Dime, the study can delve into specific design interventions and their potential impact, providing a template or model that can be applied to other social media platforms.

The focus group includes 6 people aged 18-25 years old who regularly use social media platforms. Because the aim is to include people aged 18-25 years old, posters were spread amongst the TU Delft campus explaining and asking people to join the focus group. Furthermore, outreach was broadened to a wider audience via LinkedIn and Instagram postings. This approach aimed to diversify the group beyond just students. As a result, two of the six participants are not university students. Table 4.2 displays the focus group participants.

Table 4.2: Overview focus group participants empirical investigation

Particpant	Age	Level of activity on social media
F1	22	Highly active: I check and interact on social media platforms several times throughout the day and often post updates
F2	25	Highly active: I check and interact on social media platforms several times throughout the day and often post updates
F3	24	Moderately active: I use social media daily, mostly to browse content and occasionally post or interact
F4	25	Somewhat active: I log in a few times a week to catch up on news and occasionally interact with posts
F5	25	Somewhat active: I log in a few times a week to catch up on news and occasionally interact with posts
F6	23	Moderately active: I use social media daily, mostly to browse content and occasionally post or interact

The focus group will begin with an icebreaker where participants share three reasons for their social media usage. This leads into a discussion on social media's impact on mental well-being, with a specific focus on user reactions to various platform features. Following this, a video introduction to Dime and its design features is presented. The session concludes with an exploration of potential opportunities and challenges, particularly gathering participants' opinions on proposed interventions. An overview of the focus group protocol can be found in appendix C.

4.3. Introducing Dime

Following an interview with one of Dime's founders, this section highlights possible interventions using design features which Dime has incorporated, which they claim are aimed at enhancing mental well-being. The section starts with general information about the platform's functionalities and purpose. Then, for each of the design features found in section 3.5, it is discussed what interventions Dime has implemented. These interventions are considered foundational context for this research, which are to be discussed during the expert interviews and focus group.

4.3.1. About Dime

Dime is an event-centric platform that aims to streamline and simplify the organization of social activities. It provides a way for individuals to discover what is happening in their vicinity and to invite others to participate in their events. This approach deviates from the usual dynamics of traditional social media platforms, focusing more on direct, participatory social interactions. While traditional social media is largely about broadcasting aspects of life and interests to a broader audience, Dime aims to focus on real-life social engagement. It centers on actively involving people in personal experiences and events.

Dime functions similarly to conventional social platforms, where users begin by creating a personal

profile. This profile enables them to discover ongoing events and places in their local area. Users have the flexibility to either visit these spots or extend invitations to others to join them. The platform enables users to connect with others at the same locations, regardless of their prior relationship status as friends or strangers, thereby enabling the creation of shared experiences.

Each user's profile on Dime provides a list of events they have participated in, with an option to mark these events as either private or public. Participants can upload multimedia content, such as photos and videos, for any event they attend. This content is archived under the respective event on their profile, accessible even after the event concludes. It allows users to collectively share and revisit memories from events with others who were present.

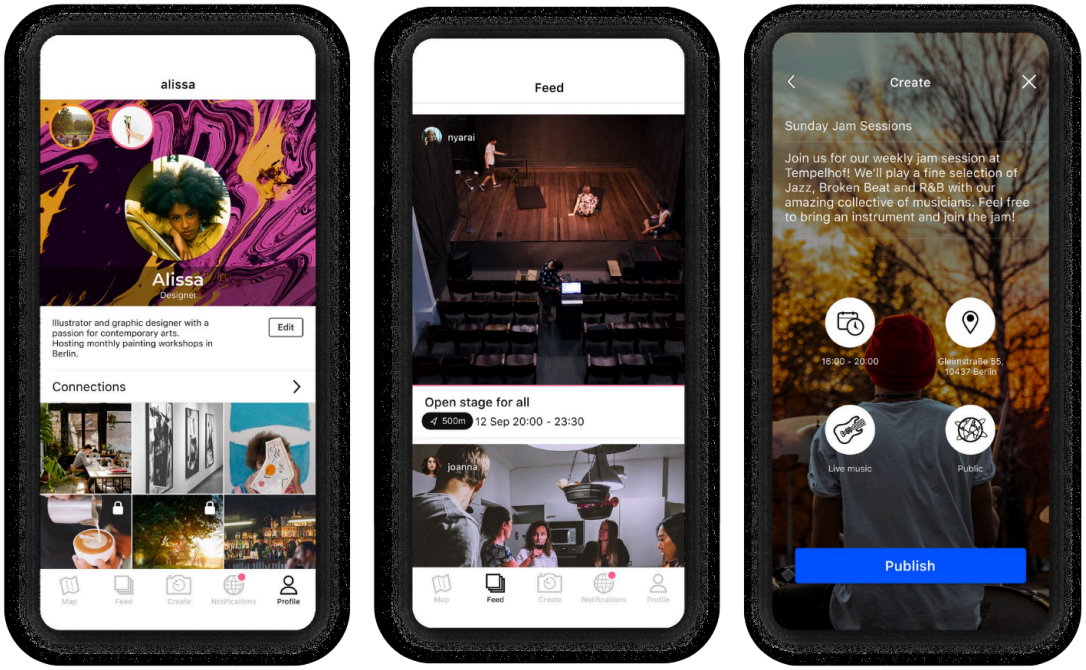

Figure 4.2: Dime's design from left to right: user profile, news feed, and event creation page

4.3.2. Design features of Dime

In section 3.5, a range of design features commonly found in social media platforms and their potential impacts on mental well-being are outlined. This analysis provided an understanding of how specific features within these platforms can influence users' mental well-being. Several design features previously outlined are present in both Dime and the major social media platforms referenced in section 3.2. However, Dime's approach to utilizing these features diverges from that of traditional platforms, and it has also entirely excluded certain features from its design. These choices, whether to utilize design features differently or completely omit them, are interventions they claim are aimed at enhancing mental well-being. This presents an opportunity to examine whether these interventions align with the values and needs of its users, particularly in the context of mental well-being.

During the interview with one of Dime's founders, each of the design features found in section 3.5 are discussed. At the end of this section, table 4.3 summarizes Dime's intervention per design feature, which form the contextual background for the interviews and focus group in order to be able to construct a values hierarchy for social media platforms in the context of mental well-being later on.

Newsfeed

One of the founders of Dime highlighted a distinction between their platform and traditional social media. He explained that conventional social media operates on a model of decentralized broadcasting, akin to the role magazines and television played in the 80s and 90s. In this model, every user becomes comparable to a magazine or TV presenter, broadcasting content to their audience. This approach has transformed the way information and content are disseminated, making it more personal and user-driven (Circ Cular, 2023).

In contrast, while Dime still features a news feed, its purpose diverges from that of traditional social media platforms. Where conventional social media platforms suggest content through algorithmic sorting, Dime has instead implemented a chronological news feed, where posts are prioritized based on their posting time rather than algorithmic predictions of user interest. The rationale behind this choice, as explained by Dime's co-founder, is to combat endless scrolling, a feature revolving around its contribution to compulsive usage patterns and negative mental well-being impacts, as explained in section 3.5.

Interactive features

When it comes to user interaction, Dime has chosen to completely omit interactive features from its platform, significantly deviating from conventional social media features which do have this feature. As such, there are no likes, no comments, and no reactions. Furthermore, while it is possible to follow people, the user profiles do not display the follower count of each profile. Instead, follower counts remain private, visible only to the individual user.

The platform does have an "attend" button, which is central to its user experience as the main purpose of the platform is to attend events. Dime is also exploring ways to verify actual attendance at events, although this is not the core focus at the moment.

The rationale behind completely omitting interactive features, as explained by the co-founder of Dime, is because they believe they are not relevant to user experience. The reasoning is that these features primarily foster comparison and can negatively impact users' self-esteem without contributing value to the platform's core objective: facilitating offline meetups. Thus, Dime aims to shift the focus towards real-world interactions, with the primary mode of engagement being participation in events.

Notifications

Discussing the Dime's approach to notifications, one of the founders emphasized a strategy that aims to minimize them as much as possible. They acknowledge that notifications can have both potential benefits and drawbacks. Dime's vision for notifications is to avoid sending any that users did not explicitly request. This is on contrast with the practices of platforms like Facebook and Instagram, which are perceived as using notifications to constantly lure users back onto their platforms.

In contrast, the types of notifications Dime plans to focus on are those related to social invitations, such as a friend invite to a birthday party or a concert. At Dime, they claim these types of notifications are socially and mentally positive, as they encourage real-life social activities and interactions.

They pointed out that ideally, users can customize the type and frequency of notifications they receive. However, Dime's current capabilities for customization are limited compared to larger platforms like Facebook, due to its status as a startup. They explain that startups often begin with a Minimum Viable Product (MVP) that offers fewer options than what might be available after a year or two of development.

Direct messages (DMs)

While at Dime, events do have a chat for the attendees to communicate with each other, the choice has been made to completely remove the feature of direct messaging, emphasizing the aim to maintain simplicity and avoid the pitfalls often associated with DMs on social media. Dime expressed concerns about the use of direct messaging for spam and harassment. This concern is rooted in a broader issue prevalent across many social platforms, where DMs become a conduit for unwanted and negative interactions (Circ Cular, 2023). In order to prevent these unwanted and negative interactions, Dime has decided to omit DMs from their platform.

Algorithmic recommendations

Unlike the most popular social media platforms, Dime does not use a complex algorithm to curate its feed, nor does it incorporate advertisements.

The guiding principle behind Dime's feed is simplicity, focusing on events and activities in the user's local area. The feed prioritizes events based on two main criteria: immediacy and proximity. Events happening at the current moment are given higher visibility in the feed compared to those scheduled for later. Similarly, events closer to the user's location are ranked higher. This means that the feed will look different for users in different cities, like Amsterdam, Rotterdam, The Hague, or Berlin, as it adapts to show events pertinent to the user's current location.

Dime customizes its feed to align with users' expressed interests and preferences. When users demonstrate a preference for certain event types or follow particular organizers, their feed adjusts to prominently feature related events and activities. This tailored experience is crafted based on the user's self-selected interests, not governed by an undisclosed algorithm. The rationale behind omitting an algorithm and letting users manually choose their preferences is because they claim it is not relevant for their platform and they want to foster simplicity.

Privacy settings

Dime offers two types of event settings: private and public. The privacy controls are designed to cater to different social scenarios and user preferences. For private events, the visibility is restricted exclusively to individuals who are directly involved or invited. On the other hand, public events on Dime offer a different level of visibility. Here, users have the option to control whether their friends can see their participation in these events. This setting allows users to either share their public event activities with strangers, their friends, or keep them private.

Unlike traditional social media platforms, where users can only set their entire profile as public or private, Dime offers more granular control by allowing users to apply these privacy settings specifically to events. If such a feature were adopted by conventional social media platforms, it would enable users to selectively make certain posts or videos public or private, independent of their overall profile settings. This means that even if a user's profile is public, they could choose to keep specific content private, offering more flexibility and control over their online privacy and content visibility.

Groups and communities

In contrast to conventional social media platforms, Dime does not offer the feature of forming groups and communities. Dime facilitates group interactions in a different manner; users can form groups through the organization of events and inviting others to join in real-life activities. Unlike other platforms, Dime does not provide a feature for establishing separate, standalone groups or communities. The rationale behind this is to keep Dime simple; given as an example, they claim that Facebook is oversaturated with too many functions such as marketplace, groups, events, and so on. At Dime, they believe it is not necessary for the platform's core function.

Multimedia integration

Dime avoids offering photo and video filters or augmented reality (AR) effects. The founders believe that these features can distort reality and contribute to unrealistic beauty standards, potentially misleading users. They argue that if users wish to apply filters to their content, they can utilize external apps or the built-in features of their smartphone cameras.

Table 4.3 gives a summary of Dime's interventions for each design feature. These interventions provide a contextual background which are to be discussed during the interviews and focus group. Section 3.5 explains the conventional representation of design features on social media platforms, discussing their affordances and the impact these have on mental well-being.

Table 4.3: Summary of Dime's interventions per design feature

Design feature	Dime's intervention
News feed	The order of content on the news feed is chronological
Interactive features	No interactive features, including the absence of a ”comments”, ”likes”, ”followers count”, or ”reactions”
Notifications	Moderation of notifications - no notifications about suggested accounts to follow or events to attend. Only notifications from people one is connected with
Direct messages (DMs)	No direct messages between users. Events do have a chat where all users attending can talk to each other
Algorithmic recommendations	No personalized feed based on data they collect about users unknowingly. Users do have the option to choose their preferences for certain events
Privacy settings	Profiles, as well as events, can either be made public or private
Groups and communities	No groups and communities can be formed outside of events
Multimedia integration	No photo or video filters will be available on Dime. Users can however edit photos or videos beforehand and then upload them onto Dime after

4.4. Conclusion stakeholder analysis

This chapter highlights the importance of understanding the diverse perspectives and values of stakeholders in the context of social media's impact on mental well-being. While VSD emphasizes the importance of including both direct and indirect stakeholders, due to the limited time and scope of this research, the interviewees are categorized into two distinct groups: those specializing in social media platforms and those in digital well-being/social media & mental health. Furthermore, a focus group is conducted involving young adults aged 18-25 who are regular social media users, in order to explore their reasons for social media usage, its impact on their mental well-being, and their reactions to different platform features. Furthermore, the Dime's interventions using the previously found design features are explored and listed, highlighting how Dime's design features diverge from traditional social media to potentially enhance users' mental well-being.

Next step

Dime's interventions for each design feature are to be discussed during the interviews and focus group to establish whether these interventions align with the values and needs of its users. Once interventions are linked to the relevant values, a values hierarchy is to be constructed, proposing design requirements from these findings.

5

Value analysis

The aim of this chapter is to identify the values surrounding mental well-being in the context of social media platforms following the interviews and focus group. The chapter starts with explaining the coding process from which 13 values have been identified, divided into higher and lower level elements. Then, each higher level value is explained. Following is the value dynamics, where the values are mapped in order to illustrate their interrelationships. By doing so, value conflicts can be identified, which will be discussed in chapter 6.

5.1. Value identification

The focus of this research is on finding the values regarding social media use in relation to mental well-being. Using ATLAS.ti software, transcripts from both the interviews, which covered social media use and mental well-being in a broad sense, and the focus group, which specifically explored Dime's interventions, were uploaded and analyzed together through the grounded theory approach. While the focus group provided the main body of information regarding specific design interventions and their implications, the interviews provide valuable background context, offering insights into the technical and psychological aspects of platforms and mental well-being. Notably, values identified were common across both data sources, justifying their combined analysis for an overall understanding of user values in relation to social media and mental well-being.

5.1.1. Coding process

Grounded theory is well-suited for VSD it allows for the exploration and identification of stakeholders' values in relation to technology use and design. Through its iterative and inductive approach, it can uncover the underlying values, needs, and opinions of users and other stakeholders. The grounded theory approach starts with collecting data and then coding the data through three phases: open coding, axial coding, and selective coding.

Open coding

Initially, quotes were labeled individually without attempting to establish connections between them through open coding. The codes for these quotes were given based on the topic that was being discussed. The initial round of codes can be found in the second column of the code book in appendix D.1.

Axial coding

To enhance the understanding of these codes, quotes corresponding to different labels were grouped into categories alongside quotes that shared similar foundations, also known as axial coding. As such, three types of codes have been identified, namely ”design feature”, ”intervention”, and ”value”, which can be found in the first column of the code book in appendix D.1. In the thesis, ”design feature” is categorized based on the compilation of design features identified from the literature review. Conversely, ”value” refers to the principles or standards that individuals consider important in their lives, which are observed through their expressions and reactions to various aspects of social media use and mental

well-being. This distinction helps to differentiate between the tangible aspects of social media design and the intangible personal or societal principles that guide user interactions and preferences.

Selective coding

Through the interviews and focus group, a total of 35 values have been identified, some mentioned significantly more often than others. Because 35 values are too many to explore, for this thesis, they will be divided into higher and lower level values based on their frequency of being mentioned. While this is not based on a specific theory, by doing so it becomes easier to focus design efforts on those values that are most critical in achieving desired outcomes, as they are mentioned the most. For instance, values like ”authenticity” or ”reflection” are to be considered higher level due to their groundedness - they have been mentioned significantly more often than values like ”user feedback” and ”sustainable design”, showcasing they have a greater influence on mental well-being in social media environments. The groundedness for each of the found codes can be found in the third column of the code book in appendix D.1.

The coding process will be written out as an example for the following quotation:

> *”[...] then you start comparing to others, and seeing if there’s more likes or less likes than somebody else.” - P1*

The initial code was identified as ”comparison”. This reflects the interviewee’s discussion about comparing oneself to others based on social media metrics such as likes. During the process of axial coding, ”comparison” was categorized under ”value”, as it represents an important topic regarding mental well-being on social media platforms. It was then classified among lower level values during the selective coding phase due to its lower frequency and significance in the data compared to other codes which were labeled under ”value”. For example, ”comparison” was identified as a lower-level value with a groundedness score of 9, while in contrast, the higher-level value ”connection” received a groundedness score of 43, indicating a much stronger presence and significance in the discussions around social media use and mental well-being.

Table 5.1 displays the 13 identified values as a result of the selective coding process. As such, for the higher level values, this led to a total of 163 quotations. Section 5.2 gives an overview of how the higher level values have been extracted from the interviews and focus group.

Table 5.1: Identified values during the empirical investigation

	Value	Description
Higher level	*Connection*	Forming bonds with others through shared interests, experiences, and interactions
	Reflection	Reviewing or analyzing past events, actions, or decisions
	Authenticity	The quality of being genuine, true, and honest in one's actions, expressions, and intentions. It involves presenting oneself and one's experiences truthfully, without pretense or imitation
	Autonomy	The capacity and right of individuals or groups to self-govern, make their own decisions, and direct their own lives without external control or interference
	Personalization	The process of designing or producing something to meet someone's individual requirements
	Engagement	Interaction with digital content, platforms, or devices. This includes actions like clicking, viewing, commenting, or sharing content on social media platforms
	Control	The power or authority to manage, direct, or influence something
Lower level	*Mindfulness*	Psychological process of bringing one's attention to the internal and external experiences occurring in the present moment; concern for or sensitivity to things of the spirit or soul
	Awareness	The state or ability to perceive, feel, or be conscious of events, objects, or certain effects
	Sustainable design	A type of design prioritizes longevity, flexibility, and relevance, ensuring that products and systems remain effective and beneficial over time, while aligning with evolving societal values and user expectations
	Communication	The process of exchanging information, ideas, thoughts, feelings, and messages between individuals or groups
	Comparison	The process where users evaluate themselves against the lives, achievements, and experiences of others as presented online
	User feedback	Information and opinions provided by users about their experiences with a product, service, or system

5.2. Value conceptualization

Having pinpointed the relevant values in the previous section, attention is now shifted towards their conceptualization. Van de Poel (2013) defines conceptualization as the process of defining, analyzing, or describing a value to clarify its meaning and, frequently, its relevance in specific contexts. In the following section, this is done for the higher level values as these are directly aligned with critical design objectives.

Connection

The most frequently mentioned value is *connection*, which is also the the value of highest frequency when defining mental well-being, as found in table 3.1. However, in the context of social media platforms, *connection* is defined as forming bonds with others through shared interests, experiences, and interactions, while in table 3.1 it is defined as the sense that one has satisfying relationships with others, believing that one is cared for, loved, esteemed, and valued, and providing friendship or support to others. Both definitions acknowledge the importance of relationships and interactions, yet the social media definition leans more towards the mechanisms of *connection* (shared interests, experiences) rather than the emotional depth or quality of these *connections*. This is further emphasized in an interview with interviewee P5:

"...you tend to see more people online than in person, and you also tend to learn more about people online than in person, cause unless they're sort of engaged in personal conversations or parties or something like that, it means you just don't get to to learn that much about people. And so when you learn about people online, you know, it's a particular slant. It's not directed at you. It's sort of put out in public. And I think that it can have a sort of totalizing effect on people." - P5

The interviewee suggests that people often encounter and interact with more individuals online than they do in their daily in-person interactions. This online engagement allows users to learn more about others, but in a way that is different from personal, face-to-face conversations. The information shared online is public and not directed at anyone specifically, which can create a somewhat skewed or "totalizing" view of individuals. The nuanced relationship between digital and physical presence is further highlighted by interviewee P2, stating:

"You can either be alone and feel very fine with it, but it's sometimes also that you feel like you're never alone because you always have your phone with you and people want stuff from you, and sometimes you just want to be like in close proximity of people, like actually feeling their warmth, so to say." - P2

The interviewee points out that while one can be physically alone yet feel connected through their phone, this digital *connection* often lacks the deeper fulfillment of physical proximity, like feeling someone's warmth. The remark was made on how the early stages of the internet and digital media perhaps underappreciated this aspect, as there was a strong fascination with the newfound ability to connect with others regardless of physical distance. However, the interview emphasizes the importance of not losing sight of offline *connections*. This highlights a growing recognition of the value of tangible, in-person interactions, even in an increasingly digital world.

Reflection

Reflection is defined as reviewing or analyzing past events, actions, or decisions, and is a value which is not occurring in the list of values related to mental well-being. This is put in the context of social media platforms by interviewee P1, emphasizing the importance of reflection in our interaction with technology:

"Look at yourself, or at least, see what technology is doing with you or what the use of social media is doing with you. Be a little bit more reflective in a sense, and it's also maybe something that technology can help with." - P1

Interviewee P1 urges that individuals actively examine and understand the effects of technology and social media on their lives. This introspection involves assessing how these digital platforms influence one's thoughts, emotions, and behaviors. By suggesting that users be "a little bit more reflective", the interviewee is advocating for a mindful approach to technology usage, where individuals consciously observe and analyze their online behaviors and the consequent impacts on their mental state. Interestingly, the statement also opens up the possibility that technology itself could aid in this reflective process, which will be further explored in the formulation of design requirements. Additionally to P1, interviewee P3 also mentions *reflection* as an important value, not just for users, but also for platform developers:

"What are our aims and what are our goals, and what is what is ethically OK to do, and what can we do to actually prevent things that might take people down down paths that are not mentally healthy. These would be conversations that would be important to have." - P3

Here, the interviewee advocates for thoughtful discussions around what is ethically acceptable in the domain of social media, acknowledging the potential for these platforms to lead users down paths that are detrimental to their mental health. This reflection involves not only understanding the direct effects of social media use but also actively seeking ways to prevent harm. Such conversations are deemed important in guiding the responsible development and management of social media, ensuring that they support rather than undermine mental well-being.

Authenticity

As seen in table 5.1, *authenticity* is described as the quality of being genuine, true, and honest in one's actions, expressions, and intentions. It involves representing oneself and one's experiences truthfully,

without pretense and imitation. While *authencitic*y is not directly mentioned as a value in the conceptual list of values surrounding mental well-being, it can be said that is part of another value mentioned in the list, namely ”personal expressiveness”. However, ”personal expressiveness” encompasses more than just authenticity. It includes the intensity and fulfillment derived from an activity, which extends beyond the mere honesty of expression to include how deeply the activity resonates with one’s core self and values. Respondent P5 explains how the lack of *authenticity* on social media platforms leads to a sense of disorientation amongst users:

> *”It’s very difficult - the way that authenticity is manipulated so effectively [...] so I think it can make a person sort of confused about their own identity because they see all these other identities presented, which seem so clear. And then it just gets a little bit confusing what you yourself are all about.” - P5*

The respondent suggests that the way *authenticity* is portrayed on social media, particularly by influencers and other big accounts on social media, is complex. While these promotions are not inherently inauthentic, they often blur the lines between genuine personal expression and commercial interests. This blurring makes it difficult to discern what is truly authentic. Seeing these polished and seemingly clear-cut identities online can lead to confusion about one’s own identity. The clarity and confidence with which people present themselves online, often for promotional purposes, can make an individual question their own identity and how they fit into this digital landscape. The speaker touches on the challenge of finding and contributing one’s own voice amidst the noise of seemingly well-defined online personas. This can be disorienting, especially when trying to carve out a unique space or identity in a medium where *authenticity* is often presented in a highly curated and sometimes commercialized manner. The overall effect of this manipulation of *authenticity* is a kind of disorientation. Users might find themselves struggling to understand their own identities and values in the face of overwhelming and often conflicting representations of *authenticity* on social media.

In addition to this, when asked what they dislike about social media platforms with regard to their mental well-being, participants in the focus group also expressed that the lack of *authenticity* plays a role.

> *”I dislike that I measure things differently through social media. So there’s like pictures I would tag on my phone as my favorite pictures, but I wouldn’t post them on Instagram because they’re not Instagram worthy or something like that.” - F2*

The individual feels compelled to curate their online image by only posting pictures that meet certain aesthetic or social standards (”Instagram worthy”). This behavior reflects a discrepancy between their genuine preferences and what they choose to share publicly, which was a shared feeling amongst all of the participants in the focus group. This curated presentation on social media can lead to an environment where authentic self-expression is compromised, as users prioritize external validation over genuine self-representation. This can affect mental well-being, as it creates pressure to maintain an idealized online persona that may not align with one’s true self.

Autonomy

Autonomy is defined as the capacity or right of individuals or groups to make their own decisions, and direct their own lives without external control or interference, and is also a value related to mental well-being in the conceptual list. Interviewee P2 explains how users’ *autonomy* is affected on social media platforms, which has a strong connection with the value of *control*:

> *”[...] now they (users) feel like they cannot control their own content enough because the whole algorithm behind it, is still so vague. Like we don’t know how it works. So we cannot really tweak it and there aren’t any filters that we can adjust.” - P2*

The issue highlighted here is the frustration users feel due to their limited *control* over the content they encounter on these platforms, primarily because of the opaque nature of the algorithms that curate and *control* these feeds. The interviewee identifies it as a lack of ”affordance”, which refers to the inability to interact with or control one’s digital environment effectively. They suggest that the inability to fully comprehend or influence the algorithmic selection process impedes users’ autonomy, the freedom to tailor their social media experience according to their preferences. Furthermore, participants in the focus group also mentioned that they feel like their behavior on social media platforms are heavily influenced by certain design features such as the algorithmic recommendations:

> *"I probably don't like how you can be kind of easily influenced by everything. Sometimes you'll be like, if I did not even see this on Instagram, I will have never even thought about it. [...] you don't have control over the type of content you consume." - F1*

The participant notes that exposure to certain content on platforms like Instagram can significantly influence their thoughts and decisions, leading them to consider ideas or actions that they would not have otherwise. This suggests that social media content can subtly guide users' thoughts and behaviors. When individuals feel that their choices or thoughts are heavily influenced by social media content, it suggests a reduction in their autonomous decision-making.

Personalization

Another value that often came to light during the interviews and focus group is *personalization*, which can be explained as the process of designing or producing something to meet someone's individual requirements. While *personalization* is not not directly mentioned in the conceptual list of mental well-being values, perhaps the value of "environmental mastery" is closely related. The purpose of *personalization* on social media is to create a more engaging and tailored user experience, while "environmental mastery" is about creating a life environment that aligns with personal values. A common theme amongst the interviews with those who are experts in digital well-being is that while the effect of certain design features on mental well-being can be generalized, on an individual scale, these effects vary per person.

> *"[...] in one of the projects that that we did, [...] we had messages that were shown to people, and then we divided the messages in two types of messages. One were messages that were quite persuasive, so they were saying, "oh, you should go and walk 500 metres now because you've been sitting for a while". So they were trying to push people towards a certain behaviour. And then we had another group of messages, which was just informative. So they're just telling people, "oh, you've been sitting down for half an hour" but not really trying to push them to do anything based on that or not encouraging them directly. And we notice that we had kind of mixed her feelings with our participants. We had some people that really liked the suggestions [...] and we had other people that were saying, "[...] that's something that I don't really appreciate." So I think personalization and taking into account people's needs and their preferences is very, very important when we think about these design features." - P3*

The core observation is that *personalization* is crucial because people respond differently to the same digital stimuli. This is illustrated through the differing reactions to the persuasive versus informative messages about physical activity. Some participants appreciated the direct suggestions, finding them helpful and actionable, while others perceived them as overbearing or intrusive. This variation in responses underscores the need for *personalization* in digital tools and platforms. The interviewee suggests that understanding and accommodating individual user preferences and needs is essential. Without such *personalization*, digital interventions may be ineffective or even counterproductive. Furthermore, another interviewee relates *personalization* to the value of *autonomy*:

> *"[...] one of the important aspects is the fact that it should be an autonomous choice. [...] For myself, I now limited my screen time on Instagram to half an hour, so I did that myself. If I get a reminder, I feel like, "oh shoot, already?"" - P2*

The interviewee mentions setting a personal limit on their phone screen time on Instagram to half an hour, a decision they made autonomously. This self-imposed restriction reflects a conscious effort to manage their digital consumption according to their own needs and preferences, rather than being externally controlled or influenced. It shows that *personalization* in the context of mental well-being on social media is not just about how content is tailored to the user by the platform and its algorithmic recommendations. It is also about users exercising their *autonomy* to *personalize* their own experience – in this case, by setting boundaries for usage.

Engagement

The next value is *engagement*. In the context of social media, *engagement* refers to the interaction with digital content, platforms, or devices. This includes tangible actions such as clicking, viewing, commenting, or sharing content. This form of *engagement* is externally observable and quantifiable. It is focused on the user's active participation with digital content and how they interact with various elements of social media platforms. *Engagement* is also a value of mental well-being, yet it is defined as

the capacity to become deeply absorbed and focused on one's activities, encompassing involvement and interest in life activities and tasks. This concept is more internal and subjective. It is about the quality of attention and interest one brings to their activities, and the sense of immersion and fulfillment derived from these activities. This is further elaborated on by interviewee P2:

> *"[...] when scrolling we do not really stop and think about the things that we're doing, because it's just so continuous and it has all these affordances that just kind of forces us to keep scrolling and scrolling and scrolling, and it plays very nicely into the gratification. [...] the fact that you can just keep on scrolling and it never ends, you need to have very strong self control and at the same time also be aware of what you're doing because even if you have that self control and you're able to stop, you might not even notice that you're doing it." - P2*

The interviewee notes that the process of scrolling through social media is continuous, which often prevents users from pausing to think about what they are doing. This continuity is facilitated by the design and "affordances" of the platforms – features that encourage and enable continuous engagement without interruption, playing into users' needs for instant gratification. The endless stream of content caters to a desire for constant stimulation and new information, which can be psychologically rewarding. The interviewee further highlights the need for strong *self-control* and *awareness* to counteract this continuous scrolling behavior. Even with *self-control*, it can be challenging for users to recognize their own engagement patterns. There is an implicit suggestion that the design of social media platforms can make it difficult for users to engage with content *mindfully* and intentionally, which was also mentioned by users in the focus group:

> *"[...] every time I see, "oh somebody posts something new", then you click on it and you don't just log off when you click on it. Then you are on the platform again for a few minutes. So I think that really affects how much time I spend on my phone, because every time I think, "ohh, I'd have to look again" or something." - F2*

The participant is mentioning how notifications influence their engagement on social media platforms. When a notification is received, it acts as a trigger that compels the user to open the app to see the new post. The interviewee acknowledges that these notifications significantly affect the amount of time they spend on their phone. Each notification creates a sense of curiosity or obligation to check the app ("ohh, I'd have to look again"), which cumulatively increases the total time spent on social media. This creates a cycle where notifications keep drawing the user back to the platform, prolonging their engagement beyond what they might have intended.

Control

The last higher level value is *control*, which has also previously been mentioned with the value of *autonomy*. *Control* is described as the power or authority to manage, direct, or influence something. Similarly to the value of *personalization*, when comparing *control* to the values of mental well-being, again "environmental mastery" is the most closely related, as it includes "controlling a complex array of external activities". Participants in the focus group discussed how the lack of *control* affects them:

> *"With regard to dislike, I guess also not knowing what's true and false anymore, because in the end you do seem to get misinformed, even if it's like in a small way. And then yeah, you get the right information in a different conversation. It makes me uncomfortable I guess." - F4*
>
> *"So there's a lack of control in that sense. You don't have control over the type of content you consume." - F1*

Participant F4 expresses a dislike for the difficulty in distinguishing true information from false on social media. This challenge leads to a situation where users often find themselves misinformed, even if it is in minor ways. The realization that one might not be getting accurate information, and then later discovering the truth in a different context, creates discomfort and uncertainty. Interviewee F1 highlights that this uncertainty leads to a sense of a lack of control. If users cannot reliably discern what is true or false, they effectively lose control over the type of content they are consuming. This lack of control stems from the fact that users are at the mercy of the information presented to them, which may be misleading or incorrect.

5.3. Value dynamics

To enhance the comprehension of how various values are interconnected and to establish the dynamics of these values, the frequency with which these values are referenced in conjunction is focused on. ”Conjunction” or ”co-occurrence” refers to the instances where two or more values are mentioned or discussed together within the data. This concept helps to identify the relationships between different values by tracking how often they are referenced simultaneously. A higher co-occurrence number indicates a stronger or more frequent association between the values, suggesting they are interconnected or influence each other in the context of this study. Figure 5.1 shows the co-occurence of each value, where if a value is discussed together with another value, it has a higher co-occurence frequency.

	Value - Conne... 43	Value - Reflec... 25	Value - Auton... 22	Value - Authe... 22	Value - Perso... 20	Value - Engag... 19	Value - Control 18	Value - Mindf... 16	Value - Sustai... 11	Value - Aware... 11	Value - Comm... 9	Value - Comp... 9	Value - User f... 9
Value - Connection 43		1	1	8	1	2	1	1	0	0	4	1	0
Value - Reflection 25	1		4	1	1	1	0	1	0	5	0	0	1
Value - Autonomy 22	1	4		1	7	0	7	2	0	2	0	0	1
Value - Authenticity 22	8	1	1		0	0	2	2	0	0	0	3	0
Value - Personalization 20	1	1	7	0		2	5	1	0	0	0	0	0
Value - Engagement 19	2	1	0	0	2		2	1	2	1	1	1	0
Value - Control 18	1	0	7	2	5	2		3	0	1	0	0	0
Value - Mindfulness 16	1	1	2	2	1	1	3		0	2	1	0	0
Value - Sustainable des... 11	0	0	0	0	0	2	0	0		0	0	0	2
Value - Awareness 11	0	5	2	0	0	1	1	2	0		1	0	1
Value - Communication 9	4	0	0	0	0	1	0	1	0	1		0	0
Value - Comparison 9	1	0	0	3	0	1	0	0	0	0	0		0
Value - User feedback 9	0	1	1	0	0	0	0	0	2	1	0	0	

Figure 5.1: Co-occurence analysis of the found values, mirrored across the diagonal

From figure 5.1, all identified values are mapped to illustrate their interrelationships. These values may sometimes be contradictory or complementary, with some values being subsets of others. Additionally, certain values can trigger the emergence of other values. These recurring value pairings will serve as the foundation for developing a value map. This map will illustrate the links between these values and explain the nature of their relationships. The analysis reveals a noteworthy interplay of values that frequently emerged in both the interviews and focus group discussions. Specifically, these include the pairing of *authenticity* with *connection*, *autonomy* with *personalization*, and *autonomy* with *control*, which are seen as having the highest co-occurence frequencies in comparison to the other value pairings in figure 5.1.

Figure 5.2 visually represents all of the possible connections between the found values. Four types of connections have been identified to explain the dynamics between the values, namely:

- ”is associated with”: This relationship is used where two values frequently occur together but do not necessarily cause one another;
- ”is part of”: This is assigned where one value is a component or a necessary aspect of another value;
- ”contradicts”: This relationship is used where two values are in opposition or where one value can undermine the other;
- ”is cause of”: This relationship is appropriate where one value directly leads to the emergence or strengthening of another.

The identification of connections between values involves a two-step process. Initially, instances where values were mentioned in conjunction were noted, suggesting a potential relationship without specifying its nature. Subsequently, the context of these mentions was analyzed to understand the nature of the relationship. For instance, when ”engagement” and ”sustainable design” were discussed together, the relationship was determined to be contradictory based on the context provided by quotes like:

”[...] tailoring for the good, I would say, versus tailoring just for engagement.” - P1

The quote suggests a comparison between designing social media features with two different focuses: one aims for user well-being (”tailoring for the good”), while the other prioritizes user engagement at the expense of other considerations (”tailoring just for engagement”). This highlights a conflict between values — promoting well-being through sustainable design versus driving engagement, potentially without regard to its impact on users’ mental health or well-being. The same process was followed for each of the value pairings in order create the value map in figure 5.2.

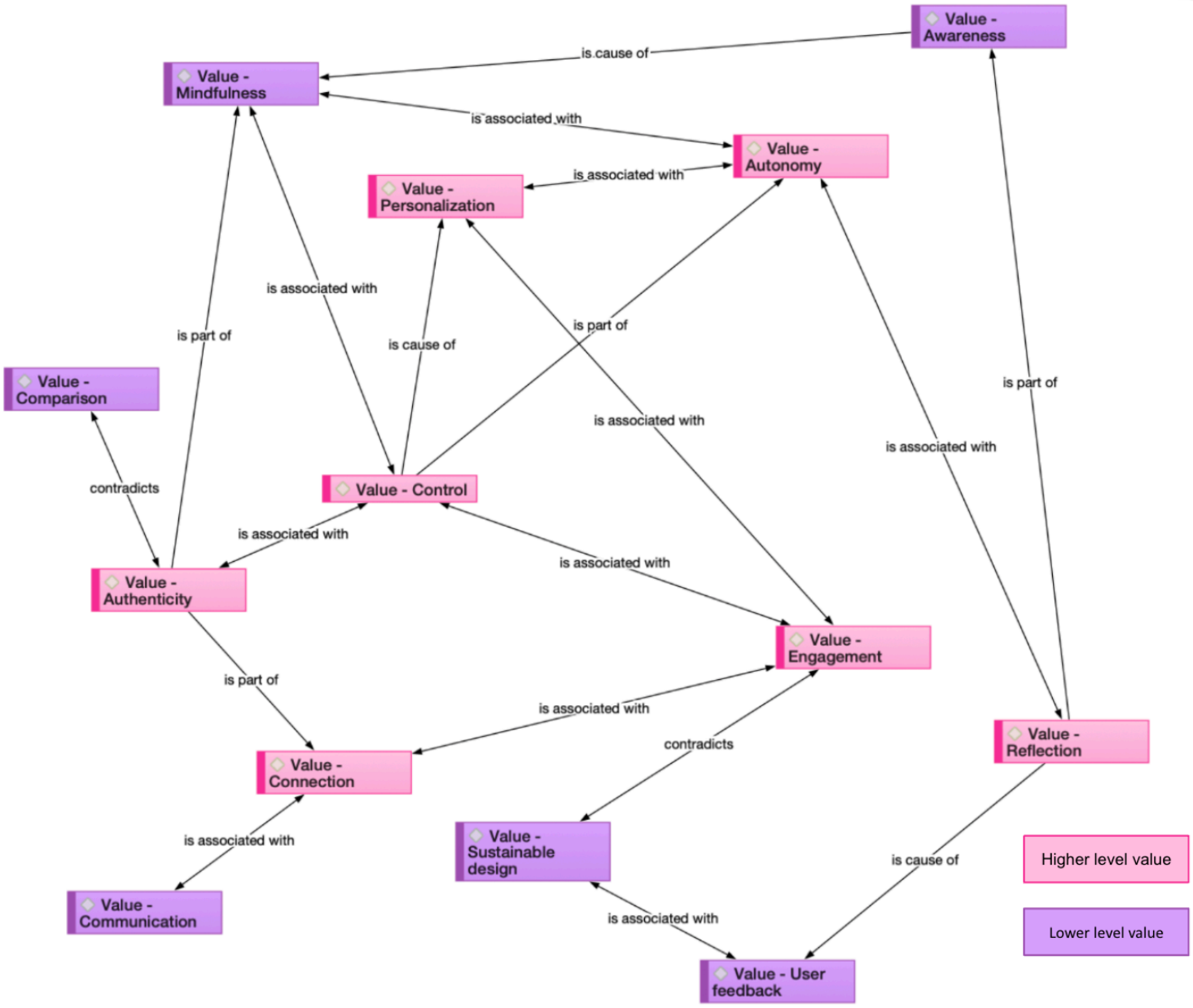

Figure 5.2: A map of the values, displaying their dynamics

In the context of Value Sensitive Design (VSD), it is important to examine potential conflicts between values. This typically occurs when the promotion of one value inadvertently restricts another, resulting in an inter-value conflict. In this analysis, two direct value conflicts have been identified yet only for lower level values, namely between *comparison* and *authenticity* and between *sustainable design* and *engagement*. However, while for the higher level values it is not directly evident that there are any conflicts, conflicts arise not from direct opposition, but rather from the absence of a particular value that would otherwise harmonize with another, which is explained in section 5.2 when examining the context of the given quotes. As such, the conflicts are between *a lack of authenticity* and *connection*, between *a lack of personalization* and *autonomy*, and finally between *a lack of control* and *autonomy*. As can be seen in figure 5.1, the pairings of these values are also most occurring in comparison to the other value pairings. That is why these value dynamics will be the main focus when formulating the design requirements.

5.4. Other findings

Aside from the values found as a result of the interviews, two other types of codes have also been identified, namely ”design feature” and ”intervention” (appendix D.1). Here, quotes have been assigned where design features are mentioned, along with for example values or interventions related to them where applicable. Furthermore, this is also done whenever interventions are mentioned, either by going through Dime’s interventions or others suggested by those interviewed or in the focus group. These codes will serve as a baseline for the bottom-up approach during the formulation of the values hierarchy, as explained in figure 2.3.

Design features and values

During the coding process, another type of code was identified, namely ”design feature”, which can be found in the codebook. This code is assigned when any of the design features found to have an impact on mental well-being is talked about. Figure 5.3 gives a ranked overview of the design features, along with the higher and lower level values that were mentioned in conjunction with the design features during the interviews and focus group.

	Design feature - Intera... 16	Design feature - Algori... 12	Design feature - Direc... 10	Design feature - Notifi... 10	Design feature - News f... 9	Design feature - Multime... 4	Design feature - Privacy s... 2	Design feature - Groups... 1
Value - Connection 43	5	0	3	0	0	0	1	1
Value - Reflection 25	0	0	0	0	1	0	0	0
Value - Authenticity 22	2	0	0	0	0	2	0	0
Value - Autonomy 22	0	5	0	3	1	0	1	0
Value - Personalizat... 20	0	6	1	1	0	0	1	0
Value - Engagement 19	2	0	0	1	0	0	0	0
Value - Control 18	0	7	0	3	1	0	0	0
Value - Mindfulness 16	0	0	1	7	2	0	0	1
Value - Awareness 11	0	0	0	0	1	0	0	0
Value - Sustainable... 11	0	0	0	0	1	0	0	0
Value - Communicat... 9	0	0	5	0	0	0	0	1
Value - Comparison 9	4	0	0	0	0	1	0	0
Value - User feedba... 9	0	0	0	0	0	0	0	0

Figure 5.3: Design features pairing with values

Taking the value of *authenticity* as an example, it was observed that design features such as ”interactive features” and ”multimedia integration” were often discussed in conjunction. Analyzing the contexts in which specific values and design features are mentioned together enables the formulation of targeted design interventions. This approach helps in understanding how various design features can enhance or hinder core values like *authenticity* within the user experience. This approach will be followed during the formulation of design requirements in the upcoming chapter.

Interventions and values

Similar to the coding of design features, another identified type of code is ”intervention”. This code is assigned when an intervention is mentioned during the interviews or focus group. These are interventions that either interviewees or users came up with themselves, or the specific interventions Dime has

incorporated into their design as discussed in the focus group. Figure 5.4 displays an overview of the interventions, along with the with the higher and lower level values that were mentioned in conjunction with the design features during the interviews and focus group.

	Value - Conne... 43	Value - Reflec... 25	Value - Authe... 22	Value - Auton... 22	Value - Perso... 20	Value - Engag... 19	Value - Control 18	Value - Mindf... 16	Value - Aware... 11	Value - Sustai... 11	Value - User f... 9	Value - Comp... 9	Value - Comm... 9
Intervention - User fee... 3	0	0	0	0	0	1	0	0	0	1	1	0	0
Intervention - User cho... 8	0	2	0	5	3	0	3	0	0	0	1	0	0
Intervention - Time ma... 7	1	2	1	1	0	1	3	4	0	0	0	0	0
Intervention - Social int... 12	8	0	2	0	0	0	1	0	0	0	0	0	0
Intervention - Reportin... 1	0	0	0	0	0	0	0	0	0	0	0	0	0
Intervention - Reminde... 13	0	11	0	4	2	0	0	1	4	0	0	0	0
Intervention - Reminde... 2	0	1	0	0	0	0	0	0	0	0	0	0	0
Intervention - Paid platf... 1	0	0	0	0	0	0	0	0	0	0	0	0	0
Intervention - No multi... 4	0	0	2	0	0	0	0	0	0	0	0	1	0
Intervention - No intera... 8	2	0	2	0	0	0	0	0	0	0	0	1	0
Intervention - No group... 1	1	0	0	0	0	0	0	0	0	0	0	0	0
Intervention - No direct... 8	3	0	0	0	1	0	0	1	0	0	0	0	5
Intervention - Monitor... 1	0	0	0	0	0	0	0	0	0	0	0	0	0
Intervention - Moderati... 6	0	0	0	3	1	0	2	3	0	0	0	0	0
Intervention - Moderati... 7	0	1	1	0	1	1	0	2	1	0	0	0	0
Intervention - Minimize... 1	0	0	0	0	0	0	0	1	0	0	0	0	0
Intervention - Instantan... 4	1	1	4	0	0	0	1	1	0	0	0	0	0
Intervention - Collabor... 1	0	0	0	0	0	0	0	0	0	0	0	0	0
Intervention - Chronolo... 4	0	0	0	0	2	0	1	0	0	0	0	0	0
Intervention - Access t... 1	0	0	0	0	0	0	0	0	0	0	0	0	0

Figure 5.4: Interventions pairing with values

Again, taking the value of *authenticity* as an example, it can be seen that multiple times the intervention labeled ”instantaneous content” was mentioned alongside it. This interventions is described as ”a design feature that encourages users to share their experiences in real-time, without significant delays or editing” based on the context it was discussed during the interviews and focus group (table D.1). This indicates a possible intervention linked to a specific value, which will be analyzed in the next chapter.

Table D.1 in appendix D.2 gives an overview of the interventions discussed during the interviews and focus group. For each intervention, if applicable, the design feature it includes is given. Furthermore, the table also shows whether it is an intervention of Dime, or whether the intervention was mentioned separately during the interviews and focus group.

5.5. Conclusion value analysis

In this chapter, an exhaustive analysis of the values associated with social media use and its impact on mental well-being is conducted. This analysis reveals an interplay of higher and lower level values that are pivotal in shaping the design and use of social media platforms. These values are not only essential in understanding the user experience but also critical in formulating design interventions aimed at enhancing mental well-being.

The investigation into value dynamics illuminates potential conflicts and complementarities among these values, offering a starting point for designing more mindful and well-being-oriented social media platforms. The findings reveal that it is not just a direct conflict of values that poses challenges to users, but significantly, the lack of essential values in social media platforms, namely the lack of *authenticity*, *personalization*, and *control*.

Next step

The insights gathered from the focus group discussions and interviews with users and experts facilitates both a top-down and bottom-up understanding of how social media design impacts user experience and mental well-being. This user-centered perspective is instrumental in guiding the formulation of design requirements that prioritize user well-being on social media platforms.

It is evident that addressing the value conflicts is essential for creating environments that support mental well-being. For each conflict, chapter 6 will delve into the design features linked to the value conflicts, as well as related interventions from Dime, in order to finally construct a values hierarchy which translates these interventions into design requirements, providing answers to research sub-question 3.

6

Redesign of social media platforms

Based on the identified value conflicts in chapter 5, this chapter aims to resolve these conflicts. For each conflict, interventions are discussed with corresponding design features, leading to design requirements. Then, a value hierarchy is constructed, visually displaying the value, norms, and proposed design requirements. This is then finalized with a table summarizing how the conflicts are resolved through the proposed design requirements.

6.1. Value conflicts

Chapter 5 identifies the values associated with social media use and mental well-being. The acceptance of design requirements by users and platform designers is dependent on the degree to which these proposed changes uphold the outlined values. Section 5.3 notes that the conflicts in this research arise from the lack of certain values. Consequently, the solutions proposed in this thesis aim to reduce or resolve these value conflicts. By addressing these conflicts, the solutions seek to support the coexistence of values, thereby increasing the likelihood that both users and platform developers will embrace the recommended design changes. Figure 6.1 presents a visual representation of the value dynamics, emphasizing the specific value conflicts that this chapter will explore in greater detail.

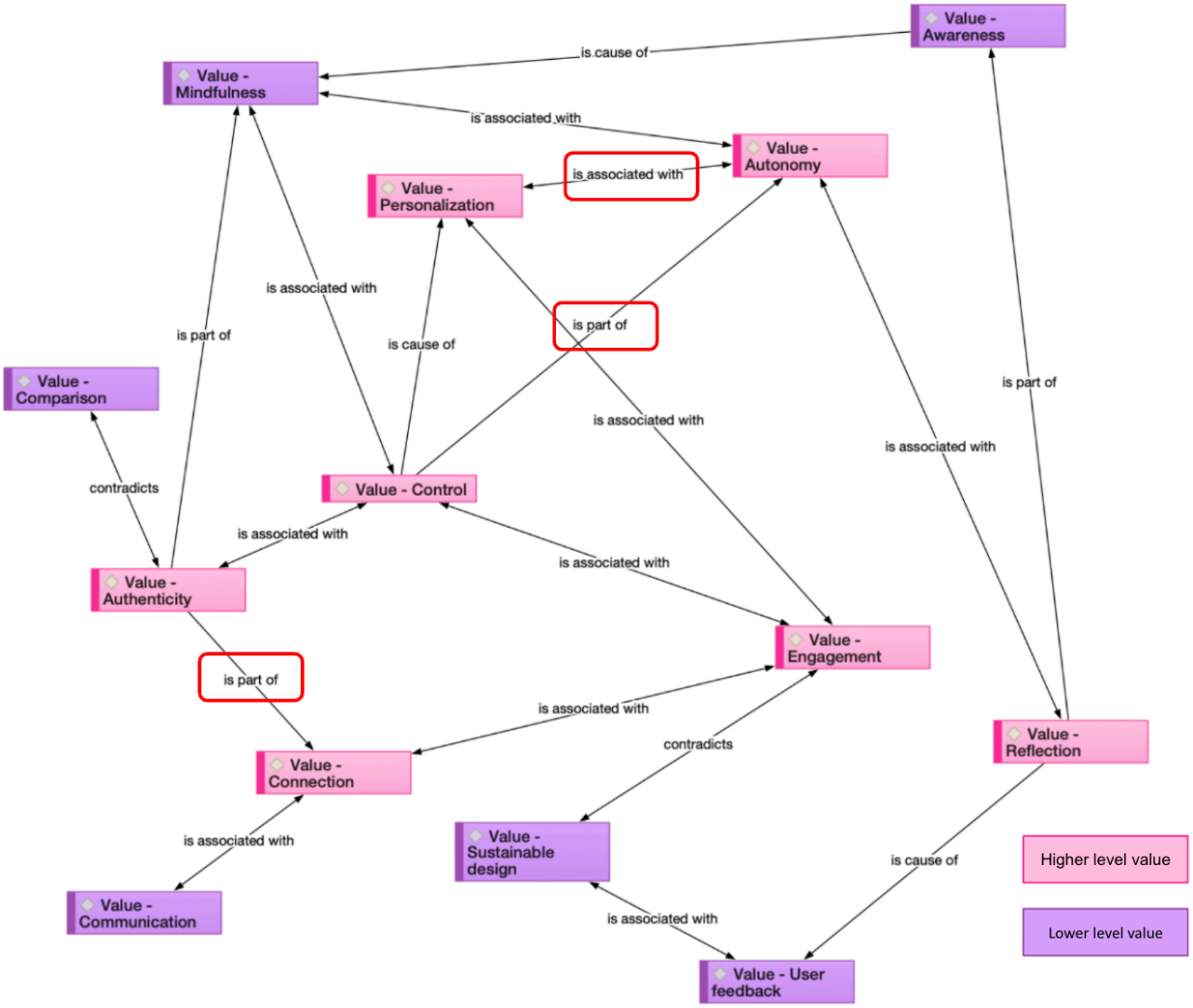

Figure 6.1: Value dynamics with conflicts circled

6.1.1. Lack of authenticity vs. connection

The relationship between *authenticity* and *connection* can be described as *authenticity* being a part of *connection*. When individuals present themselves truthfully, without pretense, the bonds formed with others are likely to be stronger and more meaningful, as authenticity is an aspect of deep and genuine connections. As explored in sections 5.2 and 5.3, the interviewees and focus group participants stated there is a lack of *authenticity* when it comes to social media platforms.

From interventions to design requirements

As seen in table 5.3, two design features have been mentioned alongside *authenticity*, namely ”interactive features” and ”multimedia integration”. In the focus group, when Dime’s intervention was introduced about not having any interactive features, the following was said:

> *”I also do like the feature that you don’t see how many connections you have, because then you’re more focused on making real connection rather than the amount of followers or followings you have.” - F3*

The participant is expressing appreciation for Dime’s intervention of concealing the quantity of social connections (such as followers or followings) a user has on a social media platform. The reasoning behind this preference is that when numerical metrics associated with connections are hidden, users are likely to focus more on the quality of their interactions rather than on accumulating a higher number of followers or likes. This feature is seen as promoting *authenticity* because it encourages users to engage in genuine exchanges and build real relationships, free from the influence of public metrics

that can often drive behavior towards seeking popularity over meaningful engagement. Essentially, the interviewee implies that by removing the visibility of these metrics, social media interactions become less about social proof and more about authentic social connections.

However, while focus group participants agreed that the quantitative aspect of interactive features affects *authenticity*, they did express that removing them as a whole is also not desirable:

> *"I think growing up as a teenager you see all your friends getting likes and comments. And suppose your friend gets more likes and comments - that will have an effect on you, especially when you're growing up in those early years." - F6*
>
> *"I think it depends. Sometimes people post their achievements and stuff so it's nice to get the congratulations and the likes for that. Whereas just posting it for a short while, that can be nice as well. But sometimes people post it just to get acceptance and things like that, so it can be both." - F1*

Participant F6 emphasizes the psychological impact that visible likes and comments can have, particularly on teenagers. By removing the visible count of these interactive features, they believe it would be a positive change, implying that it would reduce the pressure and competition for social validation. However, participant F1 adds nuance to the conversation by acknowledging the dual nature of these interactive features. They recognize that while receiving public congratulations (likes and comments) for personal achievements can be affirming and positive, relying on these features for acceptance can be problematic. In their view, likes and comments are not inherently negative; rather, it is the intent behind the post and the significance placed on these metrics that can lead to issues. Posting for genuine celebration is positive, but seeking validation and acceptance through numbers can skew the authenticity of social media interactions.

Furthermore, another design feature mentioned alongside *authenticity* is "multimedia integration". Interviewee P6 said the following about incorporating multimedia integration such as photo filters:

> *"I think it's kind of like abstracting away from reality or make you or things more beautiful than it is. And it can also be misleading. [...] we have we have all these things to do or experience on our platform and we hope that the stories reflect the reality of what is happening there." - P3*

The interviewee is expressing concern that multimedia integration features such as photo and video filters have the potential to distort reality. These tools can enhance or beautify the subject matter, which may lead to content that is more aesthetically pleasing but less authentic. The interviewee seems to suggest that while these features can enhance user engagement and creativity, there is a risk that they create an unrealistic portrayal of people, places, and events. The core of this sentiment is about the balance between creative expression and authenticity. However, while Dime has opted to completely remove multimedia integration, users in the focus group did express that by doing so, it could take away the fun for users:

> *"I don't think it will be as fun as it is. Because like for TikTok, there are so many different filters and effects you can use that kind of make the platform. And especially since you're able to do it with friends, [...] so I don't think a lot of people will be on TikTok if it wasn't there." - F1*
>
> *"But I don't like them on TikTok. I see a lot of like funny effects or something which I like. But now [...] when creators are talking they have this like beauty filter on or something and TikTok also automatically has like a beauty filter. Then I don't even see what I really look like. This I don't like because a lot of times I think it's difficult to see what is real or not." - F2*
>
> *"So as long as it's not a kind of filter which is beauty related in a sense then it should be fine." - F1*

Participant F1 feels that filters and effects contribute significantly to the fun and appeal of TikTok. They believe that the ability to use these features, particularly with friends, is a key part of what attracts users to the platform. The implication is that the variety and creativity afforded by these filters are essential to the user experience and the platform's success. While participant F2 acknowledges enjoying humorous effects, they do express discomfort with beauty filters. These filters can alter a person's appearance so much that it becomes difficult to recognize oneself, leading to a sense of detachment from reality. Participant F2 is concerned about the challenge in discerning what is real due to the pervasive use of such filters on social media platforms. Participant F1 suggests a distinction between different

types of filters. There seems to be an agreement that while some filters are purely for fun and do not distort reality in a significant way, beauty filters that alter one's appearance can be problematic. The underlying sentiment is that filters which do not relate to beauty and do not significantly alter one's appearance are acceptable and do not detract from authenticity.

Another intervention mentioned often by users in the focus group in relation to *authenticity* is "instantaneous content", which is not part of Dime's interventions. Instantaneous content refers to digital media that is captured and shared in real time, without significant delay, editing, or curation.

> *"I do also really like BeReal because [...] you don't spend so much time on the app. But also it's small, like I don't have 100 friends on there or something. I don't measure it on how many people I have there, just my friends which is a small group. And I see what they are doing, which is why I wanna use a social media platform. And I don't think like, "ohh maybe I'll post this picture just because you just posted it." - F2*
>
> *"I'll probably have to say BeReal as well. It's really simple as well. You just take a photo and then you post it and you don't really think much about it anymore."- F1*

During the focus group discussion, the social media platform BeReal was mentioned. Once a day, at a random time, BeReal notifies its users simultaneously to capture and share a photo. The notification is sent out unexpectedly, and users have a two-minute window to take and upload their photo. Unlike many other social media platforms, BeReal does not allow filters or edits. Users are encouraged to capture and share their current situation as it is, without embellishments. This approach challenges the norm of highly curated and edited content prevalent on other platforms. Participant F2 appreciates BeReal's smaller, more intimate social network. Unlike platforms where the number of friends or followers is often a measure of popularity, BeReal allows them to focus on a smaller group of actual friends. This smaller network aligns more with her desire for genuine social media interactions, seeing what her friends are actually doing in their daily lives. Furthermore, the interviewee also values the spontaneous nature of sharing on BeReal. The app's design, encourages genuine sharing without overthinking. Unlike other platforms where users might curate or plan posts for maximum impact or engagement, BeReal's approach is more about capturing and sharing a real moment as it happens. Interviewee F1 further echoes this sentiment, highlighting the simplicity of BeReal. The app's straightforward process of taking and posting a photo without much contemplation reduces the pressure to create highly curated content. This simplicity supports a more authentic representation of everyday life, as users share without the additional layer of crafting a particular image or persona.

Value hierarchy

Figure 6.2 summarizes the values hierarchy for *authenticity*. In VSD, a design requirement is a specification that emerges from the integration of human values into the design process. In this research, this will result from interventions using social media design features. As such, for the value of *authenticity*, design requirements have been formulated through analyzing the context in when values were mentioned together with either specific design features or interventions in the previous section. Furthermore, as explained in section 2.1.2, norms are various prescriptions for, and limitations on, actions which are aimed at achieving or pursuing a specific end. As the design requirements have been formulated based on the interventions of design features, as well as having conceptualized the value of *authenticity*, both a top-down and bottom-up approach has been applied to identify the norms. As such, the norms are actions which have been drawn from the definition of *authenticity* from table 5.1, which are in line with the proposed design requirements. In VSD, norms do not necessarily have to be directly measurable, but they should guide the design process towards respecting human values (Van de Poel, 2013). While direct measurement might be challenging for certain norms, their impact could potentially be assessed through user feedback, engagement metrics, and qualitative research methods that explore how well a design aligns with intended values.

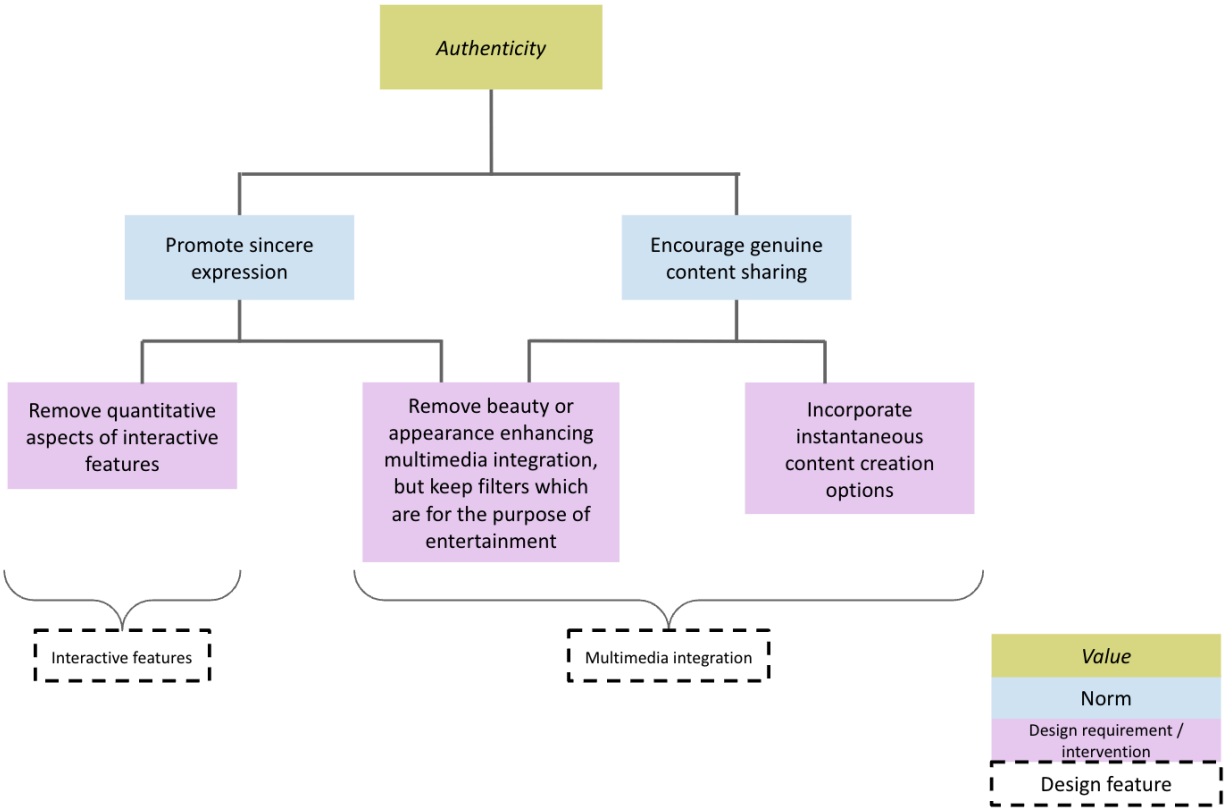

Figure 6.2: Value hierarchy for *authenticity*

Comparison with Dime's interventions

The following table summarizes how the proposed design requirements compare to Dime's interventions.

Table 6.1: Comparison of the proposed design requirements for *authenticity* with Dime's interventions

Design requirement	**Comparison to Dime**
Remove quantitative aspects of interactive features	Dime has eliminated interactive features; however, focus group participants highlighted the importance of these features for engaging with friends, expressing a preference for their presence. They suggested that removing the quantitative aspects while preserving the capacity for genuine interaction would be preferable
Remove beauty or appearance enhancing multimedia integration, but keep filters which are for the purpose of entertainment	Dime has chosen to exclude photo and video filters entirely. Yet, users acknowledged that although beauty-enhancing filters could detrimentally affect mental well-being, they found that playful and entertainment-oriented filters contribute to the enjoyment of social media platforms. Therefore, they favored retaining such entertaining filters over a total removal
Incorporate instantaneous content creation options	The suggestion to include options for creating content instantaneously originated from the focus group participants, not from Dime's existing interventions. This approach, which allows for sharing content in real-time without the option for edits, fosters the sharing of more authentic content

Value conflict resolution

While the proposed design requirements are aimed to enhance the value of *authenticity*, at the same time they also uphold the dynamics with the value *connection*. Based on the previous section, table 6.2 summarizes the proposed design requirements, how they enhance *authenticity*, and also how they affect *connection*.

Table 6.2: Summary of the proposed design requirements for *authenticity*

Design requirement	**Enhancing *authenticity***	**Effect on *connection***
Remove quantitative aspects of interactive features	By removing metrics like likes and follower counts, users are encouraged to focus on genuine self-expression rather than seeking validation through numbers	When the focus shifts away from quantitative metrics, users are more likely to engage with each other in a meaningful way. Connections become based on actual interests and interactions, rather than on the pursuit of popularity in terms of numbers
Remove beauty or appearance enhancing multimedia integration, but keep filters which are for the purpose of entertainment	Eliminating beauty filters helps in presenting a more realistic and unaltered image of oneself, while keeping entertainment filters allows for creative expression without distorting one's true appearance	When users perceive each other as they truly are, without the veil of beautifying filters, it lays the groundwork for more genuine and relatable connections
Incorporate instantaneous content creation options	Instantaneous content creation reflects real-life moments as they happen, without curated edits	Sharing content in real-time allows for a more immediate and authentic sharing of experiences

6.1.2. Lack of personalization and control vs. autonomy

As explored in sections 5.2 and 5.3, the interviewees and focus group participants stated there is both a lack of *personalization* and *control* when it comes to social media platforms, which conflicts with users *autonomy*. *Control* empowers users to make choices about their preferences and experiences. When users have *control* over how they interact with a platform, they can tailor these interactions to better suit their needs and preferences, leading to *personalization*. That is why the relationship between the two values is described as causal in figure 6.1. At the same time, *control* empowers users with the ability to make decisions regarding their interactions with a platform. When users have *control* over their preferences on social media platforms, they exercise *autonomy* by directing these aspects according to their personal values and needs.

From interventions to design requirements

As seen in table 5.3, the most commonly mentioned design feature along both values of *personalization* and *control* is "algorithmic recommendations". Interviewee P2 expressed as follows:

> *"Like we don't know how it works. So we cannot really tweak it and there aren't any filters that we can adjust. So yeah, I think the lack of the ability to person to kind of control our feed is also a lack of an affordance." - P2*

Interviewee P2 points out that users do not fully understand how the algorithmic recommendation systems work. This lack of transparency means users are unable to comprehend the criteria and mechanisms by which content is presented to them. The interviewee highlights that there is an inability to "tweak" or adjust the algorithm, indicating a lack of *control* over what content is recommended to them. On the most popular social media platforms from section 3, users receive content based on algorithms without the ability to significantly influence or personalize these recommendations according to their specific preferences. This lack of affordances for *control* and *personalization* means users are more passive recipients of content rather than active curators of their feed. This is further emphasized by interviewee P4:

”The whole reason that these algorithms are here is to take away the fact that we had to customize our own feeds. Then you should have a balance between having like super simple mechanics able to customize it.” - P4

Interviewee P4 notes that the primary reason for these algorithms is to eliminate the need for users to manually customize their feeds. Algorithmic recommendations are designed to learn from users’ past behaviors, preferences, and personal information to automatically present relevant content, simplifying the user experience by reducing the effort required to find content of interest. However, while acknowledging the convenience of algorithms, the interviewee also emphasizes the importance of having a balance. They suggest that platforms should offer simple mechanics for users who want to customize their experience without overwhelming them. This includes having straightforward options for basic *personalization* that any user can easily understand and use.

Aside from ”algorithmic recommendations”, another design feature mentioned often along side the values of *control* and *personalization* is ”notifications”. During the focus group, participant F2 said the following:

”[...] also a lot are so useless, [...] notifications like, ”look at what you missed” or something. This I don’t like when you see a sentence like that. It’s like you have to take a look at it. I thought I turned them off, and then still I’m getting them. It’s just sketchy.” - F2

Participant F2 finds many notifications to be irrelevant or ”useless”, indicating a lack of effective *personalization*. Ideally, notifications should be tailored to the user’s interests or connections, but in this case, the user is receiving alerts that are not meaningful to them, such as notifications about people they are not closely connected with. The participant’s main concern is the inability to *control* these notifications. Despite attempting to turn them off, they continue to receive certain types of notifications, like alerts about stories from acquaintances or prompts to check what they have missed. This lack of *control* is frustrating for the user, as their preferences and actions (turning off notifications) are not being effectively recognized or implemented by the platform. The respondent describes the experience as ”sketchy”, suggesting a lack of transparency in how the platform manages notifications and user settings. Furthermore, focus group participant F1 also added to this:

”[...] for example, sometimes on Instagram they give you like the suggestion of who to follow, and I find that a bit annoying. And then kind of it’s a turn off for Instagram and then I wanna turn off my notifications for that. So I think this will be better off for just the people that you’ve followed and that you’re connected to.” - F1

Participant F1 finds notifications suggesting who to follow on Instagram to be annoying. This reflects a disconnect between the platform’s algorithm-driven suggestions and the user’s personal preferences. The notifications about suggested follows are not perceived as relevant or useful by the user, indicating a lack of effective *personalization*. The participant expresses a desire to have greater *control* over the types of notifications they receive. They specifically mention wanting to turn off notifications for follow suggestions. They suggest that notifications would be better if limited to updates from people they have chosen to follow and are connected with. This preference highlights a desire for a more *personalized* notification system that aligns with their existing social connections, rather than algorithmically generated suggestions.

Another design feature mentioned is the ”news feed”. While it was stated there is a need for personalizing algorithmic recommendations, users also expressed that they would like a news feed which is of chronological order - one of Dime’s interventions. Participant F2 stated as follows:

”Ohh, maybe I would like it like on TikTok, you have this “for you” page, so it is an algorithm [...] and then also something like an ”explore” page because I really like that it doesn’t have an algorithm because then I would also see events that I would never see or attend. Then I can explore some other things.” - F2

Participant F2 appreciates the ”For You” page on TikTok, which is an algorithmically personalized feed tailored to the user’s interests and past behavior. Simultaneously, the participant expresses a liking for an ”explore page” that does not rely on an algorithm. This preference stems from the desire to encounter content outside of their usual interests or activities. The participant suggests having both types of feeds: one that is algorithmically personalized and another that allows for exploration without algorithmic influence.

Lastly, while not an intervention of Dime, during the interviews and focus group, respondents expressed that there is a need for *personalizing* reminders. This intervention is described as implement-

ing notifications or alerts within the social media platform that inform users about their usage patterns, which can be either through the design features of the ”news feed” or ”notifications”. The following was said by interviewee P1:

> *”For these kind of things, if you’re saying OK, you can only scroll for five minutes and then there’s gonna be a pop up. If that’s not something that people are actually willing to engage with, it’s not gonna do anything and it’s only gonna frustrate people. But if they if you have like again an option that say, OK, I want to be a little bit more aware of what I’m doing and how does how it makes me feel. If you can then just select the option, ”yes, I want my reflective moments in the design”, that would work better I think.” - P1*

Interviewee P1 suggests that implementing a rigid control mechanism, like a pop-up reminder after a set amount of scrolling time (e.g., five minutes), may not be effective if it is not aligned with what users are willing to accept or engage with. Such forced interventions might end up being counterproductive, leading to user frustration rather than promoting mindful use of the platform. The speaker emphasizes the importance of giving users the option to choose these reminders. By allowing users to opt-in for usage reminders, the platform respects both their *autonomy* and *control* over their experience. Furthermore, interviewee P2 added to this:

> *”So indeed you can set the time, but you cannot change the message, so that would already be like so helpful.” - P2*

The interviewee notes that while users can set the time for when they receive usage reminders, they do not have the ability to *personalize* the message of the reminder. This limitation indicates a degree of *control* over when they are reminded, but not over the content or tone of the message. It is suggested that being able to *personalize* the message of the reminder would be helpful.

Value hierarchy

Figure 6.3 summarizes the values hierarchy for both *control* and *personalization*. Similarly to the values hierarchy for *authenticity*, the norms have been identified through both a top-down and bottom-up approach. Initially coded as an ”intervention” during the analysis, the norm of allowing users to customize specific platform features was highlighted by numerous well-being and platform experts who stressed the importance of enhancing user customization on social media platforms. However, because this concept does not correspond directly with a singular design feature but rather serves as a guideline for designing features, it has been reclassified as a norm in this analysis. Furthermore, the norm of facilitating informed decision making ensures that users have access to clear and comprehensive information to make informed decisions about their use of the platform. This allows for transparency in how the platform operates, making it a key element of both values. Lastly, the norm of actively soliciting and incorporating user feedback was also firstly classified as an ”intervention” during the coding process, but was initially not directly tied to a specific design feature. This norm advocates for a platform design principle that prioritizes the user’s ability to influence and select the sequencing of content they engage with.

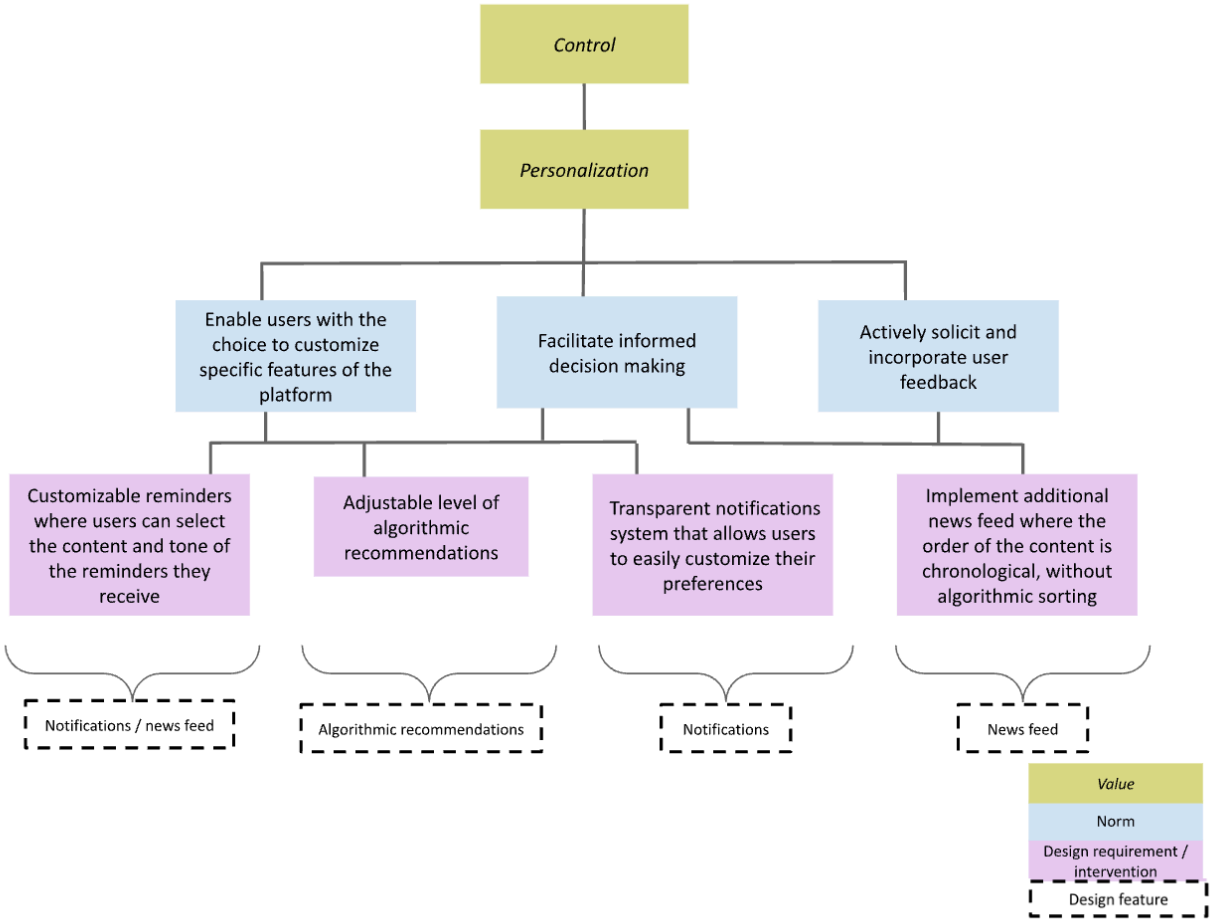

Figure 6.3: Value hierarchy for *control* and *personalization*

Comparison with Dime's interventions

The following table summarizes how the proposed design requirements compare to Dime's interventions.

Table 6.3: Comparison of the proposed design requirements for *control* and *personalization* with Dime's interventions

Design requirement	Comparison to Dime
Customizable reminders where users can select the content and tone of the reminders they receive	The focus group participants proposed the idea of customizable reminders, allowing users to personalize the content and tone of notifications regarding their usage patterns — a feature not currently offered by Dime. Dime lacks any form of reminders about user activity. The participants favored having these reminders but emphasized the importance of personalizing the content and tone, granting users the flexibility to tailor these notifications or news feed messages to their preferences
Adjustable level of algorithmic recommendations	Dime does not employ a personalized feed that curates content based on unknowingly collected user data. Nonetheless, users recognized the benefit of algorithms in tailoring content to their preferences, while also noting the potential for such content to become oversaturated and overwhelming. To address this, they proposed the option for users to adjust the extent of algorithmic recommendations, enabling them to determine the level of personalization they desire
Transparent notifications system that allows users to easily customize their preferences	Dime has intentionally limited the types of notifications users receive to prevent overwhelming them with excess information. Unlike typical social media platforms, Dime does not send notifications about suggested accounts to follow or events to attend. However, users have indicated a desire to select the notifications they receive, a feature that is not straightforward on traditional platforms. Therefore, the design requirement emphasizes the need for a transparent and customizable notification system, enabling users to effortlessly tailor their notification preferences
Implement additional news feed where the order of the content is chronological, without algorithmic sorting	Dime's news feed is organized chronologically, prioritizing events that are nearing their conclusion at the top of the page. Users appreciated this setup but also recognized the value in algorithmic recommendations for discovering content aligned with their interests. Consequently, they proposed the creation of two separate news feeds: one that offers an adjustable degree of algorithmic recommendations and another that displays content in chronological order from their connections

Value conflict resolution

While the proposed design requirements are aimed to enhance the values of *control* and *personalization*, at the same time they also uphold the dynamics with the value *autonomy*. Based on the previous section, table 6.4 summarizes the proposed design requirements, how they enhance both *control* and *personalization*, and also how they affect *autonomy*.

Table 6.4: Summary of proposed design requirements for *control* and *personalization*

Design requirement	**Enhancing *personalization***	**Enhancing *control***	**Effect on *autonomy***
Customizable reminders where users can select the content and tone of the reminders they receive	Reminders become more than generic notifications; they transform into personalized cues designed to meet and respect the individual requirements of each use	Users are given the power and authority to manage how they are notified and engaged by the platform	The platform empowers them with choice, a fundamental aspect of autonomy
Adjustable level of algorithmic recommendations	Allows users to tailor the extent to which their content feed is influenced by an algorithm	Users gain the power and authority to manage and direct the nature of their content consumption	Offering flexibility and choice, and empowering users with greater control over their social media environment
Transparent notifications system that allows users to easily customize their preferences	Enables users to tailor their notification settings according to their individual needs and desires	Users gain authority over how and when the platform communicates with them	Empowers users with informed choices, control over their digital environment, and the ability to tailor their social media experience
Implement additional news feed where the order of the content is chronological, without algorithmic sorting	As this is an additional chronological news feed next to a customizable news feed, it caters to the individual requirements of users who prefer a linear, time-based approach to content consumption	Gives users the authority to direct their engagement with the platform, choosing between a curated algorithmic feed and a sequential, chronological feed	Ensures that users' choices are based on a clear understanding of the platform's mechanics and policies

6.2. Conclusion redesign social media platforms

The aim of this chapter is to reimagine social media platforms through the lens of Value Sensitive Design (VSD), focusing on mitigating value conflicts identified in chapter 5 and proposing design recommendations to enhance *authenticity*, *personalization*, and *control*. By proposing the targeted design interventions, this chapter not only seeks to resolve these conflicts but also to reimagine the social media ecosystem as a more inclusive, user-centric, and well-being-oriented space.

The design recommendations outlined in this chapter — ranging from customizable reminders, adjustable algorithmic recommendations, and incorporating instantaenous content creation options — embody a strategic approach to enhance the values of *authenticity*, *personalization*, and *control*. These interventions are grounded in the empirical insights drawn from expert interviews and focus group discussions, ensuring that the proposed solutions are not only theoretically sound but also practically relevant and grounded in real-world user experiences.

Next step

Having found a set of proposed design requirements, the next step is to evaluate what the results mean within the context of this research, and how they compare to the findings of the literature review. This is further aided by an evaluation of the limitations of this study, including factors that might affect the generalizability of the results.

7

Discussion

This study investigated the design features of social media platforms that are recognized for impacting mental well-being, and proposed design requirements to alleviate their impact. This chapter discusses the research findings and how they compare to existing literature. Then, the limitations of this research are explored.

7.1. Research findings

The following section discusses the research findings and how they compare to the literature.

Design features

In the investigation of social media's impact on mental well-being, this research's analysis in chapters 5 and 6 provides insights into the relationship between design features, interventions, and values. The literature review initially identified a total of eight design features influencing mental well-being. However, the subsequent formulation of design requirements suggested alterations to only five of these features, leaving direct messages (DMs), privacy settings, and groups and communities unchanged. This selective approach to design alteration is underpinned by the insights derived from interviews and focus group discussions. Specifically, the analysis of direct messages highlighted *communication* as the main associated value, which has been categorized as a lower-level value in the context of this research. Figure 5.3 further reveals that privacy settings and groups and communities were among the least mentioned design features during these discussions. The decision not to alter certain design features points towards a strategic focus on those aspects of social media that are perceived to have a more direct or significant impact on mental well-being.

The literature review in section 3.5 explains the effect of the most significant design features on users' mental well-being. The following overview compares the suggested design requirements to these findings:

- **News feed:** By offering customizable reminders, users gain control over their engagement, potentially reducing the risks associated with excessive use. Furthermore, introducing an alternative, chronological newsfeed reduces exposure to algorithmically sorted content, which can help in combating the issues of echo chambers, filter bubbles, and social comparison by providing a less curated stream of information.
- **Interactive features:** By eliminating metrics like likes and shares, the intervention aims to reduce social comparison and the pressure for social validation, aligning with research findings that link these features to emotional dysregulation and addictive behaviors. This approach focuses on the quality of interactions rather than quantitative metrics.
- **Notifications:** By enabling users to tailor their notification settings, this intervention addresses concerns about anxiety, stress, and information overload associated with general alerts. It allows users to control their digital environment, potentially mitigating negative effects such as distraction and compulsive behavior, reducing the psychological burden of constant notifications.
- **Direct messages (DMs):** No proposed design interventions.

- **Algorithmic recommendations:** By allowing users to modify the extent to which their content is algorithmically curated, this intervention aims to mitigate the ”filter bubble” effect and the potential for misinformation spread. It offers a means to balance personalized content with a broader perspective, potentially reducing addiction-like behaviors and the adverse mental health impacts associated with highly personalized streams of content.
- **Privacy settings:** No proposed design interventions.
- **Groups and communities:** No proposed design interventions.
- **Multimedia integration:** By incorporating options for instantaneous content creation and removing beautifying filters, these interventions address concerns about body image issues and the pursuit of unrealistic beauty standards. This approach promotes more genuine and less appearance-focused interactions on social media, aligning with findings that highlight the negative impact of beautifying filters on self-esteem and mental well-being.

Common values

Table 7.1 provides a comparison between the values found in the context of mental well-being in social media environments and values from the literature review which are associated with mental well-being in a broader sense (see table 3.1).

Table 7.1: Comparison of found values

	Found value	Mental well-being value
Higher level	*Connection*	✓
	Reflection	
	Authenticity	✓
	Autonomy	✓
	Personalization	
	Engagement	✓
	Control	✓
Lower level	*Mindfulness*	✓
	Awareness	
	Sustainable design	
	Communication	
	Comparison	
	User feedback	

This analysis revealed that, from a total of 13 identified values, only 6 are common to both contexts. The small sample size of the study might have constrained the diversity and range of values captured, potentially overlooking values that could be more universally acknowledged in a larger or more varied population. Expanding the sample size in future research could enrich the understanding of universally held values related to mental well-being in social media contexts.

Furthermore, the found values in the context of social media platforms may reflect intrinsic attributes of these platforms, indicating that certain aspects of social media might inherently support or hinder mental well-being. This differentiation implies that social media platforms contain inherent values that can uniquely affect users’ mental well-being, separate from wider life situations.

Interventions

Table D.1 in the appendix summarizes the range of interventions discussed during the interviews and focus group. These interventions span a number of applications, from those directly connected to specific design features to broader strategies that go beyond traditional design features. For instance, the initiative by Dime to encourage social interaction through the facilitation of offline meetups or events underscores the potential for innovative approaches that extend beyond traditional design features. While the direct linkage of certain interventions to specific design features is clear, the exploration of broader, value-driven strategies presents an opportunity to understand how social media can foster environments supportive of mental well-being through indirect means. Although this research’s scope does not extend to a detailed examination of these broader interventions, the mention of Dime’s approach serves as an example of how platforms might integrate values into their design philosophies in non-traditional ways.

7.2. Limitations

This research acknowledges certain limitations that are important to consider when evaluating its progress and outcomes. Including these limitations is essential for suggesting areas for future improvement, and are explained as follows.

Design features

One limitation of this thesis is that the identified design features significantly impacting mental well-being were derived from existing literature, which may not encompass the full range of relevant features. This approach potentially overlooks emerging or less documented design features that could also influence mental well-being. Furthermore, rapid technological changes and evolving user behaviors could mean that findings may not fully apply to future developments in social media design and usage.

Sample size

The research presented in this thesis is subject to several limitations that call for consideration. A limitation that arises is from the scope of the study's sample size and its implications on the generalizability of the findings. The research identified a disparity in the values associated with mental well-being between the literature review and empirical data, with only a subset of values recurring in both contexts. This discrepancy raises questions about the representativeness of the sample and suggests that a larger, more diverse sample might have yielded a broader consensus on shared values.

Interview questions

In chapter 4, where stakeholders relevant to social media and mental well-being are listed, it is noted that ideally, VSD involves interviewing representatives from each stakeholder group to gather comprehensive insights. However, due to time constraints of this thesis and the lack of responses from contacted individuals, this extensive engagement with all identified stakeholder groups was not feasible. Furthermore, in reflecting on the structure of the interview questions, it is recognized that they could have been better tailored to delve into how interviewees feel about certain topics, aligning more closely with the VSD interview approach, which emphasizes understanding participants' feelings and values (Friedman, 1997). Although this technique was applied during the focus group discussion, it could have been utilized more extensively in the one-on-one interviews. This approach might have uncovered a richer insights into the values and experiences of social media users, further informing the study's design requirements. Furthermore, another limitation of this study is that while mental well-being was defined with focus group participants, such clarification was not extended to expert interviewees. Unfortunately, this oversight means there was no systematic approach to ensure a unified understanding of mental well-being among all interviewees, potentially affecting the reliability of their responses due to varying interpretations of the concept.

Prototyping

In section 2.1.3 the shortcomings of VSD are discussed, addressing the limitation of VSD not inherently including monitoring, evaluation, or measurement of its solutions. That is why it is suggested to extend VSD to the entire lifecycle of rapidly evolving technologies, such as social media platforms. As such, the aspiration for the proposed design interventions outlined in chapter 6 to transition from theoretical constructs to tangible prototypes is needed. Nonetheless, the practical realization of this remains speculative within the confines of this study, primarily due to the lack of direct access to social media platforms for empirical testing. Despite this limitation, the research methodology incorporates both top-down and bottom-up approaches, ensuring that the proposed design requirements are rooted in user-centered principles.

There is a necessity for collaboration with tech giants to effectively implement and test design interventions. However, a significant barrier to this collaboration is the confidentiality and proprietary concerns of these companies. Tech giants often harbor reservations about sharing data or allowing external interventions that could potentially compromise their operational confidentiality or competitive advantage. This challenge is not unique to this research but is a common hurdle for academic and independent researchers seeking to influence and collaborate with major technology firms. Such collaboration is necessary, given that the validation of any proposed interventions requires testing in the very environments they are designed to improve (Stray & Hadfield, 2023).

8

Conclusion

This chapter wraps up this thesis, addressing the research questions outlined in chapter 1. Following this, recommendations are given for future research. The chapter is concluded with a reflection on the research.

8.1. Research questions

This study delved into the influence of social media platform design features on mental well-being, aiming to develop interventions that could positively impact users' mental well-being. The study's primary objective, outlined in chapter 1, was to pinpoint and prioritize those design features on social media platforms that most significantly affect user mental well-being. Employing Value Sensitive Design (VSD) as the analytical framework, the research sought to uncover specific design interventions that could improve mental well-being outcomes. These interventions are designed to offer practical guidance to social media developers, encouraging the creation of features that are both user-friendly and instrumental in improving mental well-being.

To meet its objective, the study embraced VSD as its analytical backbone, allowing for a thorough examination of the issues at hand. This involved identifying key values within the social media environment relevant to mental well-being and suggesting design interventions that align with these values. The research unfolded in two phases. Initially, exploratory methods were employed to shed light on the design features in question, generating insights on existing mental well-being challenges. Subsequently, the study proposed design interventions using the found design features, leveraging both top-down and bottom-up strategies to ensure the suggestions were well-grounded and user-centered.

Given this research's objective, the main research question was formulated as follows:

"What social media design features can social media platform developers leverage to enhance the mental well-being of young adults?"

In order to answer this question, three sub-questions have been formulated, which will be answered separately each.

Research sub-question 1

"What are the most relevant design features of popular social media platforms that significantly influence users' mental well-being?"

As stated in chapter 1, although the broad effects of social media on mental health are extensively recognized, there remains a gap regarding the influence of particular design features on these outcomes. That is why sub-question one focuses on identifying which specific features of social media design have a significant impact on young adults' mental well-being. In order to answer this, a literature review was conducted in chapter 3.

In the literature review, firstly the definition of mental well-being was defined. It was concluded that mental well-being is context dependent and as such subject to different interpretations. In order to make the definition of mental well-being applicable in the context of social media platforms, it was

operationalized in terms of values. Then, through a review of articles which focus on the effect of social media platforms on mental well-being, eight design features have been found to have an impact on mental well-being, which are as follows:

Design feature	Description
News feed	Presents a continuous stream of updates from friends, followed accounts, advertisers, and algorithmically suggested content
Interactive features	Includes likes, comments, shares, follow, and reactions, which serve as immediate feedback mechanisms for shared content
Notifications	Designed to alert users about interactions, keeping them engaged with the platform
Direct messages (DMs)	Allows for private conversations
Algorithmic recommendations	Tailored to enhance user engagement, algorithmic recommendations present content that aligns with a user's past behavior, preferences, and personal information
Privacy settings	User-controlled options that allow individuals to manage who can see their content, interact with them, and access their personal information
Groups and communities	Dedicated spaces where users with common interests or backgrounds can connect, share, and interact with each other
Multimedia integration	Features like photo and video filters, GIFs, stickers, and AR effects enhance content creation

Then, for each design feature, its functionality and possible effects on mental well-being were explored. This systematic method of examining how social media design influences mental well-being was necessary for creating design interventions aimed at fostering an enhanced mental well-being social media environment.

Research sub-question 2

"What values are at stake when it comes to the design of social media platforms and its effect on mental well-being?"

In the process of answering research sub-question 2, the interviews and focus group transcripts were coded, resulting in a list of 13 values. These values were then divided into higher and lower level values in an attempt to focus design efforts on the most critical values. Of these values, only 6 are occurring in the list of mental well-being values found during the literature review.

	Found value	Mental well-being value
Higher level	*Connection*	✓
	Reflection	
	Authenticity	✓
	Autonomy	✓
	Personalization	
	Engagement	✓
	Control	✓
Lower level	*Mindfulness*	✓
	Awareness	
	Sustainable design	
	Communication	
	Comparison	
	User feedback	

In order to understand the interconnectedness and dynamics between the found values, the frequency with which the values have been mentioned in conjunction was focused on. This analysis reveals that rather than values directly restricting each other, it is rather the lack of certain values that lead to conflict. As such, the conflicts are between a lack of *authenticity* and *connection*, between a lack of *personalization* and *autonomy*, and finally between a lack of *control* and *autonomy*. That is why the exploration of any interventions was focused on resolving these specific conflicts.

Research sub-question 3

"What interventions could be integrated into the design of social media platforms that aim to enhance users' mental well-being?"

Having found the values of mental well-being in the context of social media platforms, the acceptance of design interventions is dependent on resolving the value conflicts. The first focus was on resolving the lack of *authenticity*. As a result, three design interventions were suggested, namely removing quantitative aspects of interactive features, removing beauty or appearance enhancing multimedia integration but keeping filters which are for the purpose of entertainment, and incorporating instantaneous content creation options. While these interventions are aimed at enhancing *authenticity*, they also have an enhancing effect on *connection*, a value that was mentioned often paired with *authenticity*.

Additionally, the subsequent two values found to be deficient are *personalization* and *control*, which are intrinsically linked through a cause-and-effect relationship. Therefore, addressing the lack of these values was undertaken simultaneously. Subsequently, four design interventions were proposed, namely having customizable reminders where users can select the content and tone of the reminders they receive, adjustable level of algorithmic recommendations, transparent notifications systems, and implementing an additional news feed where the order of content is chronological. While these interventions are aimed at enhancing *personalization* and *control*, they also have an enhancing effect on *autonomy*, a value that was mentioned often paired with both *personalization* and *control*.

Thus, seven design interventions are proposed through the previously identified design features in research sub-question 1; however, not all design features have an intervention. Out of the eight design features, only five have been adressed, leaving direct messages (DMs), privacy settings, and groups and communities unchanged. The feature of direct messages has been linked to the value *communication*, which has been categorized as a lower-level value in the context of this research and thus has not been addressed. Furthermore, the design features of privacy settings and groups and communities were the least mentioned features during the interviews and focus group. Despite the absence of specific interventions for these features, the proposed interventions focus on alleviating existing conflicts using both top-down and bottom-up strategies, ensuring that the suggested design interventions are rooted in a user-centric methodology, prioritizing the users' needs and experiences.

Intervention	Design feature	Value resolution
Remove quantitative aspects of interactive features	Interactive features	*Authenticity*
Remove beauty or appearance enhancing multimedia integration, but keep filters which are for the purpose of entertainment	Multimedia integration	*Authenticity*
Incorporate instantaneous content creation options	Multimedia integration	*Authenticity*
Customizable reminders where users can select the content and tone of the reminders they receive	Notifications / news feed	*Personalization* and *control*
Adjustable level of algorithmic recommendations	Algorithmic recommendations	*Personalization* and *control*
Transparent notifications system that allows users to easily customize their preferences	Notifications	*Personalization* and *control*
Implement additional news feed where the order of the content is chronological, without algorithmic sorting	News feed	*Personalization* and *control*

8.2. Future research

Scientific contributions

This research enriches existing literature as it applies VSD for the first time within the context of social media platforms and mental well-being. This research introduces the intersection between potential design feature interventions and VSD design requirements, translating psychological ”interventions” into practical design requirements for social media platforms. This translation is crucial, as psychological literature often discusses interventions in a way that is not directly actionable for social media platform developers. By bridging this gap, the research provides social media platform developers with clear, actionable design requirements aimed at enhancing user mental well-being. Furthermore, this research provides a comprehensive overview of the most significant design features impacting mental well-being through an extensive literature review. This systematic analysis has identified critical design features within social media platforms that influence users' mental well-being, offering a foundational understanding for future studies and interventions aimed at promoting mental well-being in digital environments. Lastly, this research contributes to the field by identifying specific values related to mental well-being within the context of social media platforms, a gap not fully explored in existing literature. While values tied to mental well-being are broadly recognized, this study pinpoints how these values manifest and interact in the environment of social media platforms.

Practical recommendations

Given the insights and findings from this study on the impact of social media design features on the mental well-being of young adults, several opportunities for future research emerge. This thesis has identified critical design features and proposed interventions aimed at enhancing users' mental well-being, yet the exploration of this complex interplay between social media design and mental well-being should be continued.

Future research could extend beyond the scope of this thesis by exploring the long-term effects of the proposed design interventions on users' mental well-being. A longitudinal study would provide deeper insights into how changes in design features influence mental well-being over time. Additionally, implementing and testing these interventions on actual social media platforms would offer invaluable feedback on their practical effectiveness and user acceptance. However, collaboration with social media companies is essential for such empirical testing, and navigating confidentiality concerns and platform access will be a significant challenge.

Another potential area for future research involves expanding the sample size and diversity to include a broader range of demographics beyond young adults. This expansion would allow for a more comprehensive understanding of how different age groups and cultural backgrounds perceive the impact of social media design on their mental well-being. It would also be beneficial to investigate design features that were not altered or addressed in this thesis, such as direct messages, privacy settings, and groups and communities to understand their potential impact fully.

Moreover, future studies could explore the integration of interventions not directly linked to design features, similar to Dime's approach of facilitating offline meetups or events. Investigating how such interventions could be implemented within social media platforms to support mental well-being could open new directions for enhancing the social media experience. Additionally, the initial classification of the design features as affordances was based on a specific analytical perspective from Maier and Fadel (2009), yet it is important to acknowledge that affordances can be interpreted and analyzed in multiple ways. This recognition opens up further research opportunities to explore and categorize design features from different theoretical and practical standpoints, potentially unveiling new opportunities for enhancing user experience and mental well-being on social media platforms

Lastly, given the recommended design requirements of this thesis, social media platform developers should prioritize partnerships with researchers, potentially through mediated collaboration platforms that respect confidentiality and proprietary concerns. Developers could explore the proposed design requirements in controlled settings, minimizing risks to operational integrity. Engaging in transparent dialogue with academic institutions may help establish mutual trust and frameworks for collaboration, allowing for empirical testing of design interventions while safeguarding their competitive advantages.

8.3. Reflection

Reflecting on the journey of writing my MSc thesis, deploying Value Sensitive Design as the analytical framework guided my investigation towards targeted design interventions aimed at enhancing mental well-being, offering a refined understanding of the dynamics between social media design features and user mental well-being. The objective was as follows: to equip social media platform developers with insights for crafting a more user-centric and mental well-being social media environment using exististing design features.

This journey was not without its hurdles. Recruiting participants for the focus group proved challenging, and obtaining materials from Dime for demonstration purposes was quite tense, leading to a stressful eve of the focus group session as materials arrived just the night before. Such moments of uncertainty tested my resilience and adaptability, which are perhaps challenges all too common in academic research.

A significant learning curve emerged from the unexpected findings related to the value of *profit* within social media platform design. Because social media design choices are driven by their underlying business structure, often ad-driven, contrary to my anticipation, the value of *profit* did not dominate the higher or lower level values identified in the study. This revelation highlights the complexity of social media ecosystems and the multifaceted motivations behind platform design, distinct from purely commercial objectives. Moreover, performing research on social media platforms highlighted the academic community's struggle with accessing data from major tech companies, echoing the difficulties faced by researchers in negotiating the guarded territories of social media giants for scholarly inquiry.

On a personal note, the Dutch saying "de laatste loodjes wegen het zwaarst" resonates deeply with my thesis writing experience. Indeed, the final stages of this academic journey proved to be the most demanding, yet they were rooted with extensive learning and self-discovery. From learning the art of conducting a literature review to engaging with interviewees and navigating the complexities of academic supervision, this process has been a vessel for growth, shaping me into a more skilled and resilient scholar.

Looking forward, I envision my career path as an advisor, drawing parallels between the problem-solving nature of consultancy and the objectives of my thesis. This project was an exercise in addressing a critical issue — enhancing mental well-being on social media platforms — through research and strategic recommendations. It has equipped me with a valuable skill set and a unique perspective that I am eager to apply in professional contexts, aiming to make a meaningful impact wherever complex problems await solutions.

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A

Value Sensitive Design

A.1. General

Table A.1: A list of human values which are often recurring in system design, adopted from Friedman et al. (2013)

Human value	**Definition**
Human welfare	Refers to people's physical, material, and psychological well-being.
Ownership and property	Refers to a right to possess an object (or information), use it, manage it, derive income from it, and bequeath it.
Privacy	Refers to a claim, an entitlement, or a right of an individual to determine what information about himself or herself can be communicated to others.
Freedom from bias	Refers to systematic unfairness perpetrated on individuals or groups, including pre-existing social bias, technical bias, and emergent social bias.
Universal usability	Refers to making all people successful users of information technology.
Trust	Refers to expectations that exist between people who can experience good will, extend good will toward others, feel vulnerable, and experience betrayal.
Autonomy	Refers to people's ability to decide, plan, and act in ways that they believe will help them to achieve their goals.
Informed consent	Refers to garnering people's agreement, encompassing criteria of disclosure and comprehension (for "informed") and voluntariness, competence, and agreement (for "consent").
Accountability	Refers to the properties that ensures that the actions of a person, people, or institution may be traced uniquely to the person, people, or institution.
Courtesy	Refers to treating people with politeness and consideration.
Identity	Refers to people's understanding of who they are over time, embracing both continuity and discontinuity over time.
Calmness	Refers to a peaceful and composed psychological state.
Environmental sustainability	Refers to sustaining ecosystems such that they meet the needs of the present without compromising future generations.

B

Interview questions

B.1. Digital well-being experts

The following interview questions were used during the interviews with digital well-being experts:

Background

- How long have you been working in your present position?
- Can you briefly describe your role and responsibilities?

General understanding

- How do you perceive the relationship between social media use and mental well-being?

Design features and impact

Design features of social media platforms can have a profound impact on users' mental well-being. Features like news feed, likes, comments, and algorithmic recommendations, while enhancing user engagement, can also lead to negative consequences. For example, interactive features like likes and comments can turn into sources of stress, as users may equate their self-worth with the engagement their content receives.

- Are there specific design features that you believe can be harmful to users' mental well-being?
- Are there specific design features that you believe can be beneficial to users' mental well-being?

The following list of design features have been found to have an impact on mental well-being:

1. News feed – continuous stream of updates from friends, followed accounts, advertisements, and algorithmically suggested content.
2. Interactive features – likes, comments, shares, follows, and reactions.
3. Notifications – designed to alert users about interactions.
4. Direct messaging – allows for private conversations.
5. Algorithmic recommendations – tailored to enhance user engagement based on a user's past behaviour, preferences, and personal information.
6. Privacy settings - user-controlled options that allow individuals to manage who can see their content, interact with them, and access their personal information.
7. Groups and communities - dedicated spaces where users with common interests or backgrounds can connect, share, and interact with each other.
8. Multimedia integration – features like photo and video filters, stickers, and AR effects.

- Which of these design features do you believe can be most harmful to users' mental well-being? Why?

- What would you recommend combatting its negative effect?
- Have you ever found yourself evaluating a design and realize you cannot satisfy all stakeholders? How did you deal with that?

Goals of social media developers

- If you were a social media platform developer, what could be obstacles you face when prioritizing mental well-being?

It can be said that the business structure or value proposition underlying social media platforms can indirectly affect users' mental well-being. For example, Instagram is based on a monetization model where they generate revenue through advertisements. The more users see ads, the more revenue is generated. As a result of this, Instagram designs their app in such a way to increase user engagement. Features include endless scrolling, notifications, and curated content feeds with the help of algorithms.

- How can social media platforms balance the need for maximizing user engagement with the responsibility to safeguard users' mental well-being?

Interventions and mental well-being

- Are you aware of any specific interventions integrated into social media platforms that aim to support users' mental well-being?
- How effective do you believe these interventions are?
- Are there any that you would recommend as beneficial?
- In your opinion, do current social media platforms designs encourage users to form offline or real-life connections?
- How do you think enhancing this aspect could contribute to improving users' mental well-being?

User interaction and outcomes

- How do you think users generally respond to interventions or features aimed at supporting mental well-being on social media platforms?

Recommendations and insights

- What would an ideal social media platform for mental well-being look like?
- If you could advise social media developers on designing features that promote positive mental well-being, what would be your top recommendations?
- Are there any emerging trends or research in the mental health field that you believe social media developers should be aware of when designing future platform features?
- What would a good collaboration look like between mental health experts and social media platform developers?
- What are your recommendations for users to maintain a healthy relationship with social media in light of its design features and potential impacts on mental well-being?

Ending

- Do you have any insights that we have not discussed but believe are important to mention?

B.2. Platform developers

The following interview questions were used during the interviews with platform developers. Note these questions are also divided up into two segments: questions specific to Dime as a platform, which were conducted during the interviews with one of Dime's founders, as well as more general questions to other platform developers. The questions specific to Dime are colored in orange, while the questions specific to other social media platform developers are in blue, and questions for both parties are colored black.

Background

- How long have you been working in your present position?
- Can you briefly describe your role and responsibilities?

Background information (Dime)

- Can you provide a description of what Dime is?
- What problem or challenges in the domain of social media did you aim to address?

Design features and impact

Design features of social media platforms can have a profound impact on users' mental well-being. Features like news feed, likes, comments, and algorithmic recommendations, while enhancing user engagement, can also lead to negative consequences. For example, interactive features like likes and comments can turn into sources of stress, as users may equate their self-worth with the engagement their content receives.

- Are there specific design features that you believe can be harmful to users' mental well-being?
- Are there specific design features that you believe can be beneficial to users' mental well-being?

The following list of design features have been found to have an impact on mental well-being:

1. News feed – continuous stream of updates from friends, followed accounts, advertisements, and algorithmically suggested content.
2. Interactive features – likes, comments, shares, follows, and reactions.
3. Notifications – designed to alert users about interactions.
4. Direct messaging – allows for private conversations.
5. Algorithmic recommendations – tailored to enhance user engagement based on a user's past behaviour, preferences, and personal information.
6. Privacy settings - user-controlled options that allow individuals to manage who can see their content, interact with them, and access their personal information.
7. Groups and communities - dedicated spaces where users with common interests or backgrounds can connect, share, and interact with each other.
8. Multimedia integration – features like photo and video filters, stickers, and AR effects.

- Which of these design features do you believe can be most harmful to users' mental well-being? Why?
- What would you recommend combatting its negative effect?
- Have you ever found yourself evaluating a design and realize you cannot satisfy all stakeholders? How did you deal with that?

Design features and mental well-being (Dime)

- What specific features of Dime were designed with a focus on improving users' mental well-being?
- Do you measure or evaluate the impact of these features on users' mental well-being? If yes, how?
- How does the user experience on Dime differ from that of traditional social media platforms like Facebook, Instagram, or Twitter?
- Were there any particular findings that influenced your design choices?
- Dime has intentionally omitted features like the "like" button and follower counts. Could you explain the rationale behind these decisions and how they contribute to a healthier online environment?
- In what ways does Dime encourage meaningful interactions and content sharing among its users?
- How does this compare to the way engagement occurs on other platforms?

Goals of social media developers

- If you were a social media platform developer, what could be obstacles you face when prioritizing mental well-being?

It can be said that the business structure or value proposition underlying social media platforms can indirectly affect users' mental well-being. For example, Instagram is based on a monetization model where they generate revenue through advertisements. The more users see ads, the more revenue is generated. As a result of this, Instagram designs their app in such a way to increase user engagement. Features include endless scrolling, notifications, and curated content feeds with the help of algorithms.

- How can social media platforms balance the need for maximizing user engagement with the responsibility to safeguard users' mental well-being?
- Are there any unique monetization or advertising strategies employed by Dime?
- How do they differ from those of other social media platforms?
- How has Dime approached issues of content moderation and the prevention of harmful content on its platform?
- What steps have been taken to foster a positive and safe community?
- From your perspective, what are the standout advantages and unique selling points of Dime that differentiate it from other popular social media platforms?

Interventions for mental well-being (Dime)

- How do you determine the effectiveness of these interventions?
- In your opinion, do current social media platforms designs encourage users to form offline or real-life connections?
- How do you think enhancing this aspect could contribute to improving users' mental well-being?

Interventions for mental well-being (others)

- Are you aware of any specific interventions integrated into social media platforms that aim to support users' mental well-being?
- How effective do you believe these interventions are?
- Are there any that you would recommend as beneficial?
- In your opinion, do current social media platforms designs encourage users to form offline or real-life connections?
- How do you think enhancing this aspect could contribute to improving users' mental well-being?

User interaction and feedback

- How do users typically respond to features or interventions aimed at supporting mental well-being?

Challenges and learnings

- What challenges have you faced when trying to design features that positively influence mental well-being?
- Are there any lessons or insights you've gained from user feedback or data that have influenced design decisions regarding mental well-being?

Future directions and collaborations (Dime)

- Are there any collaborations or partnerships (e.g., with mental health organizations) that you're considering or have established to enhance the platform's positive impact on mental well-being?
- What would good collaboration look like?

Future directions and collaborations (others)

- How do you envision the evolution of design features on social media platforms in relation to mental well-being?
- What would a good collaboration look like between mental health experts and social media platform developers?

Ending

- Do you have any insights that we have not discussed but believe are important to mention?

C

Focus group protocol

This focus group protocol is designed to engage young adults aged 18-25 who are active on social media and to gather insights on design features and their impact on mental well-being.

Objective:
To explore the impact of design features on mental well-being in the context of a novel social media platform, Dime.

Participants:
Young adults aged 18-25 who are active on social media.

Duration:
Approximately 90 minutes.

Location:
A comfortable and quiet room conducive to open discussion.

Materials:

1. Consent forms
2. Audio/video recording equipment
3. Snacks and beverages
4. Presentation slides
5. Printed screenshots or demo version of Dime

Protocol:
Welcome and introduction (10 minutes)

- Greet participants and thank them for their time.
- Explain the purpose of the focus group and the importance of their input.
- Assure confidentiality and explain the use of audio/video recording.
- Obtain consent forms.

Icebreaker activity (5 minutes)

- Conduct a brief icebreaker to make participants feel comfortable.

Discussion on general social media use (15 minutes)

- Ask participants about their current social media usage and experiences.
- Explain what is meant with mental well-being.

- Discuss what they like and dislike about existing platforms, particularly with regard to mental well-being.
- Ask participants what their ideal social media platform would look like, with regard to for example design, features, or functionality.

Design features of social media platforms (15 minutes)

- Present and explain the list of design features found to have the most significant impact on mental well-being.
- Discuss which feature they believe could be most impactful.

Overview of Dime (10 minutes)

- Present the Dime platform, emphasizing its unique features such as the absence of a like button and invisible follower count.
- Explain the focus on posting events for offline experiences.

Introduction to Dime's features (20 minutes)

- Showcase Dime's features in detail, particularly with regard to the design features which have an impact on mental well-being.
- Allow participants to interact with the demo or screenshots.

Focused discussion on Dime (30 minutes)

- Discuss for each design feature of Dime how participants feel and think about it.
- Opportunities and challenges:
  - What opportunities do you see with a platform like Dime?
  - What challenges might users face with this kind of platform?

Feedback on intervention strategies (10 minutes)

- Discuss participants' opinions on intervention strategies for mental well-being in social media.
- Explore their thoughts on how existing platforms could implement such strategies.

Closing and thank you (5 minutes)

- Summarize key points discussed.
- Thank participants for their valuable input.
- Inform them about the next steps and how their feedback will be used.

D

Code analysis

D.1. Code book

Type	Code	Groundedness
DESIGN FEATURE	Algorithmic recommendations	12
DESIGN FEATURE	Direct messages (DMs)	10
DESIGN FEATURE	Groups and communities	1
DESIGN FEATURE	Interactive features	16
DESIGN FEATURE	Multimedia integration	4
DESIGN FEATURE	News feed	9
DESIGN FEATURE	Notifications	10
DESIGN FEATURE	Privacy settings	2
INTERVENTION	Access to data	1
INTERVENTION	Chronological news feed	4
INTERVENTION	Collaboration with mental health professionals	1
INTERVENTION	Instantaneous content	4
INTERVENTION	Minimize number of functions	1
INTERVENTION	Moderation of content	7
INTERVENTION	Moderation of notifications	6
INTERVENTION	Monitoring harmful content	1
INTERVENTION	No direct messages (DMs)	8
INTERVENTION	No groups and communities	1
INTERVENTION	No interactive features	8
INTERVENTION	No multimedia integration	4
INTERVENTION	Paid platforms	1
INTERVENTION	Reminders for developers	2
INTERVENTION	Reminders for users	13
INTERVENTION	Reporting harmful content	1
INTERVENTION	Social interaction	12
INTERVENTION	Time management	7
INTERVENTION	User choice	8
INTERVENTION	User feedback	3
VALUE	Adaptability	7
VALUE	Authenticity	22
VALUE	Authority	6
VALUE	Autonomy	22
VALUE	Awareness	11

Type	Code	Groundedness
VALUE	Collaboration	4
VALUE	Communication	9
VALUE	Comparison	9
VALUE	Connection	43
VALUE	Control	18
VALUE	Convenience	1
VALUE	Dependency	8
VALUE	Engagement	19
VALUE	Entertainment	4
VALUE	Functionality	2
VALUE	Gratification	6
VALUE	Identity	5
VALUE	Individuality	8
VALUE	Information	6
VALUE	Inspiration	3
VALUE	Involvement	2
VALUE	Mindfulness	16
VALUE	Moderation	4
VALUE	Novelty	1
VALUE	Performance	2
VALUE	Personalization	20
VALUE	Privacy	5
VALUE	Profit	7
VALUE	Purpose	3
VALUE	Reflection	25
VALUE	Relatedness	2
VALUE	Sustainable design	11
VALUE	Transparency	4
VALUE	Trust	2
VALUE	User feedback	9

D.2. Interventions

The following table gives an overview of the interventions discussed during the interviews and focus group. For each intervention, if applicable, the design feature it includes is given. Furthermore, the table also shows whether it is an intervention of Dime, or whether the intervention was mentioned separately during the interviews and focus group.

Table D.1: An overview of the interventions discussed during the interviews and focus group

Intervention	Explanation	Design feature	Dime
Access to data	Social media companies should give researchers access to their data		
Chronological news feed	Displaying posts and updates in the order they are published, rather than using an algorithm to prioritize content based on user engagement or perceived interests	News feed	✓
Collaboration	Engaging with psychologists, psychiatrists, and other mental health professionals to inform and guide the design of their features		✓
Instantaneous content	A design feature that encourages users to share their experiences in real-time, without significant delays or editing	Multimedia integration	
Minimize number of functions	Involves streamlining its features to focus on specific core functionalities		✓
Moderation of content	Implementing measures to control and limit the volume of information presented to users	News feed	
Moderation of notifications	Adjusting the frequency and type of alerts that users receive	Notifications	✓
Monitoring harmful content	Identifying and managing posts, comments, and media that are inappropriate, offensive, or detrimental to users' well-being		✓
No direct messages (DMs)	Disabling the private messaging function	Direct messages (DMs)	✓
No groups and communities	Eliminating features that allow users to form or join private or public groupings based on shared interests or affiliations	Groups and communties	✓
No interactive features	Removing elements like likes, comments, shares, and follows, which enable users to interact with each other's content	Interactive features	✓
No multimedia integration	Eliminating features that allow the enhancing or editing of photo, video, audio, and other multimedia content	Multimedia integration	✓
Paid platform	Charging users a fee to access and use the service		
Reminders for developers	Integrating periodic prompts or structured moments within the development process for social media platforms, where the developers pause to reflect on and evaluate the impact of their platform on users' mental well-being		
Reminders for users	Implementing notifications or alerts within the social media platform that inform users about their usage patterns	News feed / notifications	
Reporting harmful content	Providing a feature through which users can flag posts, comments, or accounts that they find offensive, abusive, or otherwise inappropriate		✓

Intervention	Explanation	Design feature	Dime
Social interaction	Involves designing social media features that facilitate offline meetups or events, connecting users beyond the digital space		✓
Time management	Integrating features that help users monitor and control the amount of time they spend on the platform		
User choice	Users having the choice to customize specific features of the platform according to their personal preferences		
User feedback	Involves actively seeking, analyzing, and integrating the input and suggestions of users into the ongoing development and refinement of the platform		