Enhancing User Experience and User Self-Awareness on Social Network Sites:

The Mediating Role of User Experience and Interaction Design

Selen Naz Saritas

July 2023

POLITECNICO
MILANO 1863

SCUOLA DEL DESIGN

Enhancing User Experience and User Self-Awareness on Social Network Sites:

The Mediating Role of User Experience and Interaction Design

Digital and Interaction Design
Master Thesis
A. A. 2022-2023

Author
Selen Naz Saritas

Matricola
964624

Supervisor
Margherita Pillan

This page intentionally left blank

To my sisters, Elif and Şeri

Acknowledgement

I would like to express my heartfelt gratitude to the following individuals who have been instrumental in the completion of my master's thesis and have provided unwavering support throughout my academic journey.

First and foremost, I extend my deepest gratitude to my supervisor and course coordinator of the Digital and Interaction master program at Politecnico di Milano, *Margherita Pillan*, not only for the expertise, and guidance in the research process but also for my whole master's journey. Her mentorship and the opportunities she has provided have been invaluable, shaping my thesis and my entire university experience. I am genuinely grateful for the knowledge I have gained under her guidance.

I am also very thankful to my friends for their love and support. Starting with *Ezgi Arar*, my constant companion throughout this Italy journey, sharing a home with her for one year has made the entire experience more memorable and easier to navigate in a foreign country. Her friendship and support have been a source of strength for me.

I would like to express my deepest gratitude to *Su Uyanık* and *Desen Topkurulu*, who have been more than just flatmates; they have become cherished friends. Thank you so much for your amazing friendship and for supporting me during the whole time we spent together and for not making me feel alone and for making me laugh a lot.

To *Martha Quinche* and *Ava Aghaali Tari*, despite the challenges posed by the pandemic and the physical distance, I am truly grateful for your unwavering friendship and support. Your encouragement and support have not only helped me navigate academic hurdles but have also been instrumental in overcoming the hardships of life.

My heartfelt appreciation goes to my bestie *Barış Zafe*r, whose unwavering presence and belief in me have been a constant source of inspiration. His courage, faith and countless moments shared together are beyond words. Thank you for your amazing friendship and for being always there for me.

Merve Kılıç, *Koray Canlar*, and *Dilan Akbaş*, I want to express my sincere gratitude for the friendship, support, and love you have shown me from Turkey. Thank you for the joyful moments you have brought into my life.

Lastly, I am indebted to my best friend *Nemira Sak* for her continuous support and unwavering belief in me. Your friendship has been an invaluable source of strength, and I am incredibly grateful for your presence in my life.

Abstract *English*

This thesis explores the challenges and opportunities presented by Social Network Sites (SNSs) in contemporary society, focusing on the intersection of User Experience (UX), Interaction Design (IxD), Machine Learning (ML) algorithms, and ethical considerations. The research examines the profound impact of SNSs on individuals' lives and society, revolutionizing communication, enabling global connections, and virtual community engagement. However, it also uncovers concerns related to users' well-being, changes in social norms, and potential privacy and security issues.

The study identifies key dimensions that impact user experience on SNSs, including the interface design of SNSs, ML algorithms, and users' abilities and user emotional well-being. It emphasizes the significance of user self-awareness and advocates for informed decision-making to empower users and cultivate positive user experiences. Additionally, the research highlights the emotional aspects of SNS usage and negative emotions that arise from users' experiences, such as loneliness, lower self-esteem, and depression. It suggests design interventions to mitigate negative emotions and enhance user satisfaction.

Ethical implications related to data privacy, algorithmic bias, and manipulation are examined, recognizing the need to integrate ethical principles in SNS design. The study underlines the pivotal role of UX and IxD designers in mediating between users and advanced SNS technologies, shaping user experiences, and addressing user needs, behaviors, and emotions.

Within the thesis study, to support SNS designers, a design proposal that is a supportive design tool is developed, providing a framework and resources to guide the design process for SNSs. The proposal aims to foster self-awareness, user well-being, and positive user experiences by promoting user-centered design practices and considering ethical implications.

Overall, this thesis contributes to understanding the challenges and opportunities of SNSs, emphasizing user-centered design practices, ethical considerations, and the promotion of positive experiences. It provides insights for designers to enhance user experiences, well-being, and self-awareness on SNSs, ultimately leading to more meaningful and responsible digital interactions.

keywords: social network sites, user experience, interaction design, machine learning algorithms, ethical considerations, user self-awareness

Abstract *Italiano*

Questa tesi esplora le sfide e le opportunità presentate dai Social Network Sites (SNS) nella società contemporanea, concentrandosi sull'intersezione di User Experience (UX), Interaction Design (IxD), algoritmi di Machine Learning (ML) e considerazioni etiche. La ricerca esamina il profondo impatto degli SNS sulla vita e sulla società degli individui, rivoluzionando la comunicazione, consentendo connessioni globali e il coinvolgimento della comunità virtuale. Tuttavia, rivela anche preoccupazioni relative al benessere degli utenti, cambiamenti nelle norme sociali e potenziali problemi di privacy e sicurezza.

Lo studio identifica le dimensioni chiave che influiscono sull'esperienza dell'utente sugli SNS, tra cui il design dell'interfaccia degli SNS, gli algoritmi ML e le capacità degli utenti e il benessere emotivo degli utenti. Sottolinea l'importanza dell'autoconsapevolezza dell'utente e sostiene un processo decisionale informato per potenziare gli utenti e coltivare esperienze utente positive. Inoltre, la ricerca mette in evidenza gli aspetti emotivi dell'uso di SNS e le emozioni negative che derivano dalle esperienze degli utenti, come la solitudine, la bassa autostima e la depressione. Suggerisce interventi di progettazione per mitigare le emozioni negative e migliorare la soddisfazione degli utenti.

Vengono esaminate le implicazioni etiche relative alla privacy dei dati, al pregiudizio algoritmico e alla manipolazione, riconoscendo la necessità di integrare i principi etici nella progettazione dei SNS. Lo studio sottolinea il ruolo fondamentale dei progettisti UX e IxD nella mediazione tra utenti e tecnologie SNS avanzate, modellando le esperienze degli utenti e affrontando le esigenze, i comportamenti e le emozioni degli utenti.

All'interno dello studio di tesi, per supportare i progettisti di SNS, viene sviluppata una proposta di progettazione che è uno strumento di progettazione di supporto, fornendo una struttura e risorse per guidare il processo di progettazione per SNS. La proposta mira a favorire l'autoconsapevolezza, il benessere degli utenti e le esperienze utente positive promuovendo pratiche di progettazione incentrate sull'utente e considerando le implicazioni etiche.

Nel complesso, questa tesi contribuisce a comprendere le sfide e le opportunità dei SNS, sottolineando le pratiche di progettazione incentrate sull'utente, le considerazioni etiche e la promozione di esperienze positive. Fornisce approfondimenti ai progettisti per migliorare le esperienze degli utenti, il benessere e l'autoconsapevolezza sugli SNS, portando infine a interazioni digitali più significative e responsabili.

parole chiave: siti di social network, esperienza utente, design dell'interazione, algoritmi di apprendimento automatico, considerazioni etiche, autoconsapevolezza dell'utente

Table of Contents

List of Abbreviations

AI: Artificial Intelligence

ANN: Artificial Neural Network

ASHA: American Speech-Language-Hearing Association

BiLSTM: Bidirectional Long Short-Term Memory

CNN Convolutional Neural Network

DL: Deep Learning

DMs: Direct Messages

EDPB: European Data Protection Board

GDPR: General Data Protection Regulation

IxD: Interaction Design

JTBD: Jobs-to-be-done

LSTM: Long Short-Term Memory

ML: Machine Learning

NLP: Natural Language Processing

PII: Personally Identifiable Information

RNN: Recurrent Neural Network

SNS: Social Network Site

UGT: Uses and Gratifications Theory

UX: User Experience

Chapter 1

INTRODUCTION

The Internet, a worldwide network of interconnected computers, servers, and routers, has brought about profound changes in various spheres of contemporary society and how people interact with one another; thereby, with the rapid growth of the Internet and its extensive influence, which permeates almost every industry and radically transforms many, it has emerged the phenomenon of social media (Ellison & boyd, 2013). As social media broadly refers to online platforms and applications that facilitate the creation, sharing, and exchange of user-generated content and promote social interactions, one of the foremost impacts is the rise of social network sites (SNSs) which are widely acclaimed as popular socializing mediums where individuals transmit information and share their thoughts and interests (Kaplan & Haenlein, 2010). Indeed, starting with MySpace and Facebook, and then advancing with Instagram, Twitter, LinkedIn, and other platforms connect billions of people worldwide, enabling them to communicate with friends, and family members, discover new communities and interests, and engage in social and professional networking. Thus, today, these platforms have considered requisite for people's daily lives, shaping social interactions, influencing individuals' opinions, and even impacting societal and political dynamics, even more, many individuals cannot imagine a life without these technologies.

In the meantime, the field of artificial intelligence (AI) has tremendously progressed aiming to offer individuals a wide range of opportunities, such as personalization, natural language processing, or recommendation systems in digital solutions (Pannu, 2015). Correspondingly, as a reflection of this on the social media landscape, SNSs enormously benefit from AI and machine learning (ML) to capture user data, analyze them to understand user behaviors, and improve user experience (Lewis & Moorkens, 2020). By powering SNSs with ML algorithms, platforms provide users with personalized content and recommendations, targeted advertisements, and user interfaces that adapt to individual preferences and behaviors. However, it is no surprise that doubts about the use of AI and ethical concerns arise as these technologies evolve and the convergence of SNSs and ML advances (Turculeţ, 2014).

For instance, the utilization of machine learning algorithms in social network sites raises questions about privacy, data security, algorithmic bias, and the potential for manipulation.

Besides, is essential to consider both the positive and negative implications of SNS usage since being aware of both the benefits and drawbacks of using SNSs might encourage handling the negative experiences in SNSs and performing positive and healthy SNS interactions (Fox & Moreland, 2015). In this sense, SNSs have brought about positive societal impacts, revolutionizing communication and enabling global connections, experience sharing, and virtual community engagement (Amedie, 2015), and these platforms might play a crucial role in social activism, information dissemination, and democratic movements. Additionally, SNSs make significant contributions to education, providing new opportunities for learning, collaboration, and knowledge sharing among students and educators (Rasheed et al., 2020). Furthermore, these platforms have also transformed the way businesses connect with their target audiences, promote their products or services, and engage in customer relationship management and have created new avenues for advertising, brand promotion, and customer interaction, allowing businesses to reach a wider audience and achieve higher levels of customer engagement (Siddiqui & Singh, 2016). On the other hand, using SNSs raises concerns for both individuals' well-being and society. The drawbacks can be particularly concerning when it comes to the physical and mental health of individuals, especially younger generations. SNS usage has been linked to feelings of loneliness, depression, and anxiety, as individuals compare themselves to idealized lifestyles and experience the fear of missing out (Oberst et al., 2017; Seabrook et al., 2016). Moreover, SNSs have been associated with changes in social norms and behaviors, affecting social relationships and interpersonal dynamics (Fox & Moreland, 2015).

Given the extensive influence of SNSs on individuals' lives and society as a whole and the relationship between AI and SNSs, it becomes essential to examine the role of user experience (UX) and interaction design (IxD) in addressing and mitigating these concerns. In the realm of SNSs, UX, and IxD play a pivotal role in shaping users' engagement and satisfaction. Effective UX design could consider factors, such as ease of navigation, usability of features, content relevance, and personalization. By offering seamless and intuitive interfaces, SNSs aim to enhance user satisfaction, encourage prolonged usage, and foster positive social interactions. Nonetheless, one of the reasons for the emergence of all these problems and concerns is that SNSs are black boxes that do not provide any explanation to create a user awareness of how the ML-powered systems work or what user data are used; as a consequence, it can affect users' SNS experience and satisfaction adversely (Nagulendra & Vassileva, 2016), which highlights the significance of incorporating transparency and disclosure mechanisms that inform users about data usage, algorithmic processes, and privacy practices into SNS design. By providing users with insights into how AI operates within

the platform, SNSs can foster a sense of trust and empower users to make informed decisions. Furthermore, the exchange of information and the building of online relationships on SNSs emphasize the importance of information quality and user self-awareness. The effects of information quality can greatly impact user interactions, emphasizing the need for users to be discerning and critical consumers of online content (Huda, 2022). SNSs can play a significant role in enhancing user self-awareness by integrating features that promote critical thinking, fact-checking, and media literacy. By empowering users to evaluate information and navigate the vast landscape of online content, SNSs can contribute to a more informed and responsible user base.
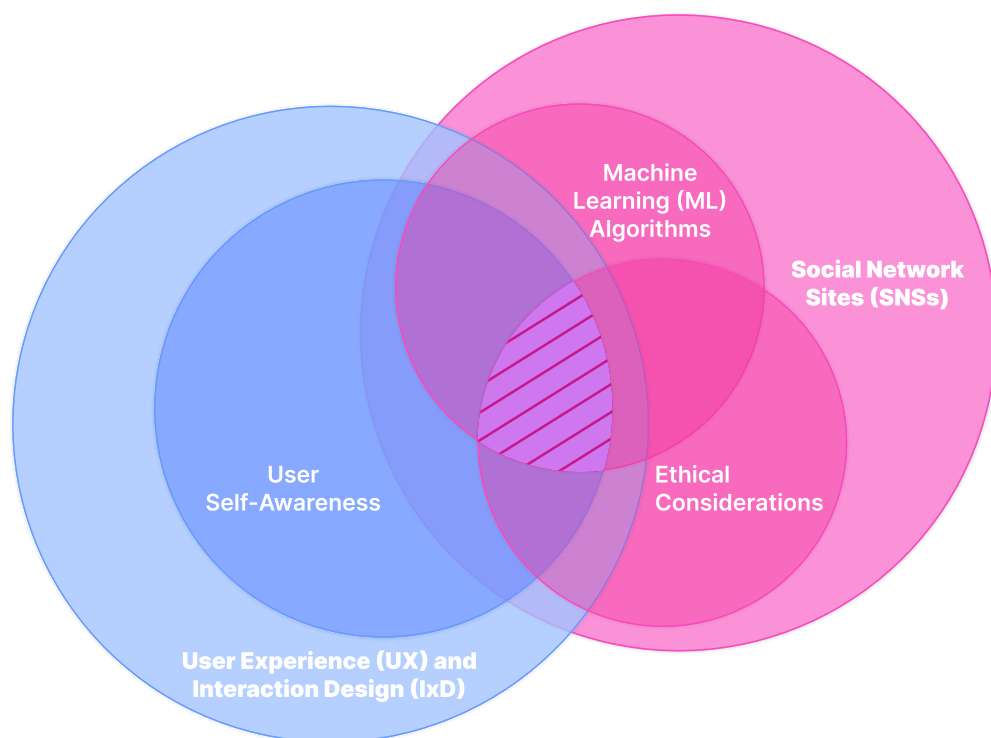
Figure 1.1 The pillars of the thesis and the research area in the intersection of studies within the literature

In light of these, this thesis draws on the comprehensive literature on *Social Network Sites* and *User Experience and Interaction Design* to explore the intersection of *Machine Learning Algorithms*, *Ethical Considerations*, and *User Self-Awareness* (see Fig. 1.1). The pervasive influence of SNSs in contemporary society, coupled with the integration of ML algorithms within these platforms, necessitates a deeper examination of the role of UX and IxD, and designers in the context of SNSs in addressing associated challenges and opportunities. Designers and other actors who are involved in the process of developing such platforms have a responsibility to ensure that the user experience is not only engaging but also prioritizes positive user experiences and

satisfaction, improves user self-awareness, and fosters meaningful interactions, ultimately contributing to a healthier digital ecosystem. In conclusion, this research seeks to contribute to a deeper understanding of the challenges and opportunities presented by SNSs, providing insights into the development of user-centered design practices with ethical considerations in the context of SNSs.

1.1 Aims and Objectives of the Research

The basis of the research focuses on the context of SNS, UX, and IxD while the intersection is on ML algorithms, and user self-awareness with consideration of ethical principles. Within this scope, this study aims to (i) explore and identify the challenges and opportunities presented by SNSs in contemporary society, considering the integration of ML algorithms and ethical considerations, (ii) examine and define the potential of UX and IxD practices and the role of designers in fostering positive user experiences, improving user self-awareness, and promoting meaningful interactions on SNSs, and (iii) contribute to the development of user-centered design practices for SNSs, considering the creation of positive digital solutions.

Accordingly, the research objectives are to:

- understand the needs and behaviors of SNS users by starting the field research process by analyzing first-hand perspective on the research topic through the complete participant observation method, and then extending the field research by making use of an online survey;

- examine the impact of SNS design, including ML algorithms, on user experience, interactions, and user self-awareness;

- investigate the gap between user needs, user rights, and limitations of SNS features;

- develop design insights and a design proposal for SNSs that prioritize positive user experience and promote user empowerment and self-awareness taking into account ethical considerations.

1.2 Research Questions

The main question of the research is:

- What are the SNS design directions for enhancing user experience and well-being, and how can UX and IxD designers mediate between users and the most-advanced SNS technologies to address user needs and problems?

The sub-questions that support the main questions are:

- What are the design dimensions in SNS interfaces that affect users' self-awareness, and how can these dimensions be utilized to improve user experience?

- How do SNSs make users feel, and how do these emotions affect their behaviors and interactions on these platforms?

- What are the current user needs and limitations of SNS features, and how can they be better addressed?

- What is the role of the complete participant observation method in examining user emotions, needs, and behaviors, and what can be the implications of this method in defining design intervention areas for digital solutions?

- What are the ethical implications of SNSs and emerging technologies, such as ML algorithms, and how do these implications affect user experience and interactions?

- How can designers be the mediator between users and the most-advanced SNS technologies, and what are the responsibilities of designers emerging from this role as a mediator?

1.3   Structure of the Thesis

This thesis consists of six chapters that are:

Chapter 1, *Introduction*, provides an overview of the research topic, its significance along with the aim and objectives of the research. It introduces the research questions and outlines the scope of the study.

Chapter 2, *Literature Review*, presents a comprehensive review of existing literature that is relevant to the research topic. The chapter starts by providing the general concept of social media and explaining the term social network sites. Then, it unfolds the features of SNSs, user motivations for using these sites, and the impacts of SNSs. Later, the chapter continues with concepts, theories, and frameworks of AI, and it points out the AI applications on SNSs by differentiating them into internal and external. Lastly, the chapter discusses the ethics on SNSs with multiple examples from different SNSs.

Chapter 3, *Methodology*, describes the methodological approach employed in this study. It explains the research approach, and research plan, then, provides detailed information about the preliminary and main study by elaborating on the sampling and recruitment, data collection methods, and data analysis techniques in the research with the ethical considerations.

Chapter 4, *Results and Findings*, presents the collected data and results of the analysis. The chapter begins with the results from the preliminary study of this research, which covers the analysis and insights of the participant observation study. Then, it explains the results gathered from the main study of the research, including the results of the online survey and the benchmarking research. Lastly, the chapter provides the findings of this research by dividing it into two themes, which are arranged as *limits of SNSs* and *users' boundaries of their SNS use*. Then, each theme incorporates two sub-themes; the first one embodies *the limits of interfaces* and *the limits of ML algorithms* while the latter constitutes *user abilities* and *emotional concerns*. The chapter also provides in-depth elaborations of the sub-themes and points out problem areas that offer opportunities for design intervention by aiming to answer the research questions.

Chapter 5, *Design Process*, focuses on the process of design undertaken in the study. The chapter describes the steps, process, and considerations involved in designing and developing the solution, which is the design of a supportive tool for SNS designers, aiming at enhancing the user's positive experience and satisfaction within SNSs and fostering user well-being and self-awareness. The design of the tool consists of a set of principles that are identified based on the research findings, and as a way of broadcasting this knowledge, the chapter involves a website design for this tool.

Chapter 6, *Conclusion*, summarizes the key findings and conclusions drawn from the research. It reconsiders the research questions and discusses the implications of the findings. The chapter, lastly, highlights the limitations of the study and suggests further directions for future research.

Chapter 2

LITERATURE REVIEW

This chapter examines the literature regarding the aims and goals of the study. The literature is reviewed under three main concepts: *social media*, which includes the concept of social media and its development, types of social media and SNSs, *AI*, which includes the definitions of AI, its areas and techniques, and the explanation of relation with machine learning, *ethics on SNSs* which involves ethical issues that users encounter on their SNS experience, and lastly, *user experience* and *interaction design*, which focuses on its importance and user self-awareness.

2.1   Social Media

With the advent of the Internet, the connection among people and the transfer of information from one to another have utterly changed and evolved into a new form called social media, which broadly allows individuals and businesses to connect with others and reach large audiences by conveying their messages (Cross, 2014). Thanks to social media technologies, new ways of communicating and interacting with others that people did not have before and that were considered unusual at that time have developed rapidly. Now, information is created without in-depth examination by individuals or companies and spread through two-way communication with people (Cross, 2014). Even more, the rise of smartphones has enabled social media platforms to be highly and quickly accessible at users' fingertips for them to interact with others and stay in constant contact with the world. In fact, it has become one of the most active and indispensable parts of people's lives. According to a recent review, as of July 2022, across the world, there are around 4.7 billion social media users, which equals 59 percent of the world's population (DataReportal, 2022).

Besides, when it comes to the concept of social media, it is not entirely clear what it covers or not. Yet, the first things that come to mind do not generally go beyond the social media platforms, such as Facebook, Instagram, and TikTok, or the features of social media platforms that represent the interaction modes (P. N. Howard & Parks, 2012; Kent, 2010). Indeed, what is meant by the term social media depends on the way it is used and its technology although the researchers have not built a consensus

on the social media definition (Cross, 2014). According to the article by Kaplan and Haenlein, 2010, social media refers to a group of Internet-based applications enabling users to create, modify and transmit the contents that are already produced by users, whilst P. N. Howard and Parks, 2012 outline the social media in three parts the infrastructure of information and platforms to produce and publish contents, the digital content that contains personal messages, ideas, news and cultural products, and user of the digital content, such as individuals, organizations, and industries. On the other hand, Carr and Hayes, 2015 propose a slightly elaborated but more understandable social media definition as Internet-based channels enabling users to opportunistically engage with audiences who created value from user-generated content and the perception of interaction with other people, without concerning the size of the audience, and selectively introduce and show themselves in real-time or asynchronously.

	Social Presence (Media Richness)		
	Low	**Medium**	**High**
Self-presentation (Self-disclosure) — Low	Collaborative projects *e.g., Wikipedia*	Content communities *e.g., YouTube*	Virtual game worlds *e.g., World of Warcraft*
Self-presentation (Self-disclosure) — High	Blogs	Social networking sites *e.g., Facebook, LinkedIn*	Virtual social worlds *e.g., Second Life*

Figure 2.1 Categorization of social media by Kaplan and Haenlein, 2010 regarding social presence (media richness) and self-presentation (self-disclosure)

The social media concept is extensive and has no clear boundaries and therefore has various definitions, researchers have developed different approaches for the categorization of social media platforms. For instance, in order to better distinguish the use of purpose and characteristics of the SM platforms, Kaplan and Haenlein, 2010 group them under six types based on two dimensions, which are social presence (media richness) and self-presentation (self-disclosure) (see Fig. 2.1):

- *Collaborative projects*, in which content is created collectively and simultaneously by many end users, a well-known example of this is Wikipedia,

- *Blogs*, are unique forms of websites, which are usually managed by a single user, and the content is published in chronologically reverse order with a date stamp,

- *Content communities*, allowing users to share content in a broad variety of media types from the text (e.g., BookCrossing) to photos (e.g., Flickr) to videos (e.g., YouTube),

- *Social network sites*, that are applications to facilitate users to keep in touch with their friends, and colleagues or invite other persons and send messages to each other by utilizing their personal information (e.g., Facebook, LinkedIn, and Instagram),

- *Virtual game worlds*, which are platforms that render a three-dimensional environment where users can create their own personalized avatars and interact with each other (e.g., World of Warcraft), and

- *Virtual social worlds*, where users create and present their avatars more freely to bear a resemblance to their real life and interact in a three-dimensional world similar to virtual game worlds; even further, in this type of social media, the rules are less to avoid restrictions in possible interaction variations, apart from the fundamental physical laws (e.g., Second Life).
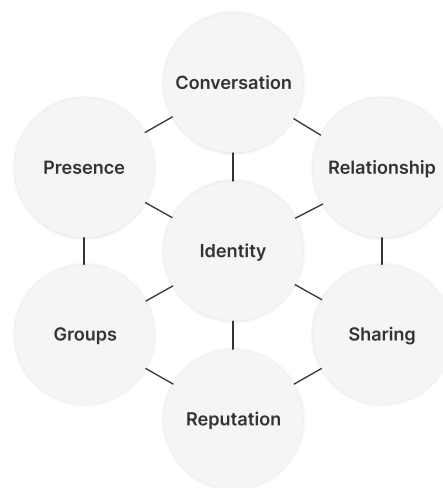
Figure 2.2 Seven featured framework of social media by Kietzmann et al., 2011.

Another approach proffered by Kietzmann et al., 2011 is a framework consisting of seven features; identity, conversations, relationships, sharing, presence, reputation, and groups (see Fig. 2.2). With this framework, the goal is to identify and analyze diverse aspects of social media user experience, and different social media platforms could include different predominant features. For example, Facebook tends to extend users' relationships while YouTube focuses on sharing and exchanging user-generated content. The following parts of this chapter will provide more detail on social network sites, which is one of the pillars of the thesis.

2.1.1 Social Network Sites (SNSs)

Social network sites are mediums that provide users to communicate with their friends or to build a network with other people via profile pages which could contain users' personal information, photos, or interests (Cross, 2014). In the literature, the terms social network sites and social networking sites are generally used interchangeably. Nonetheless, d. m. boyd and Ellison, 2007 in their publication *Social*

Network Sites: Definition, History, and Scholarship claim that using the term networking could be associated with building relationships mostly with strangers; however, even though SNSs provide an opportunity for networking, it is not a main goal on most of the SNSs. Thus, instead of using the term networking, they suggest using network since SNSs essentially allow express and make their social networks visible. Besides, after six years, Ellison and boyd, 2013 proposed a new definition for social network sites that includes three determinant characteristics of SNSs as below, due to the necessity of updating SNS in accordance with the conjuncture of the SNSs today:

> A social network site is a networked communication platform in which participants (1) have uniquely identifiable profiles that consist of user-supplied content, content provided by other users, and/or system-provided data; (2) can publicly articulate connections that can be viewed and traversed by others; and (3) can consume, produce, and/or interact with streams of user-generated content provided by their connections on the site. (p. 158)

Although the term has been propounded in earlier decades, the social network sites gained popularity in the mid-1990 through the sites, such as Classmates.com, which aimed to find and communicate with old friends from school, work, and SixDegrees.com, where everyone was connected to each other by up to six people, which the origin comes from the concept of six degrees of separation (Cross, 2014) (see Fig. 2.3). At the beginning of the 2000s, Friendster, which has the same concept as SixDegrees.com, was launched and it made a difference in SNS history by bringing the features of modern SNSs, such as profile, public list of friends and comments, later in mid–2000s, many different social network sites have arisen, but MySpace, which was founded in 2003 to target rivaling with existing SNSs, such as Friendster, AsianAvenue, and Xanga, and Facebook launched in 2004 stood out among others and both they made a great success by catching the attention of younger Internet users (d. m. boyd & Ellison, 2007). MySpace enabled users to create their Web-based profile pages with the materials that help users to express themselves, such as photos and interests, and it was also a communication channel to connect with friends and find new people; on the other hand, Facebook initially targeted to reach a small group of audiences. It was no more than a platform where students from Harvard University could communicate with their fellows by signing up to the system with their institutional email addresses, but over time, Facebook became accessible first to other universities, colleges, and then to the whole world (d. m. boyd, 2008a; d. m. boyd & Ellison, 2007; Kaplan & Haenlein, 2010). In 2006, when Facebook became public, Twitter was launched as the first microblogging site, where users send and receive text messages named tweets
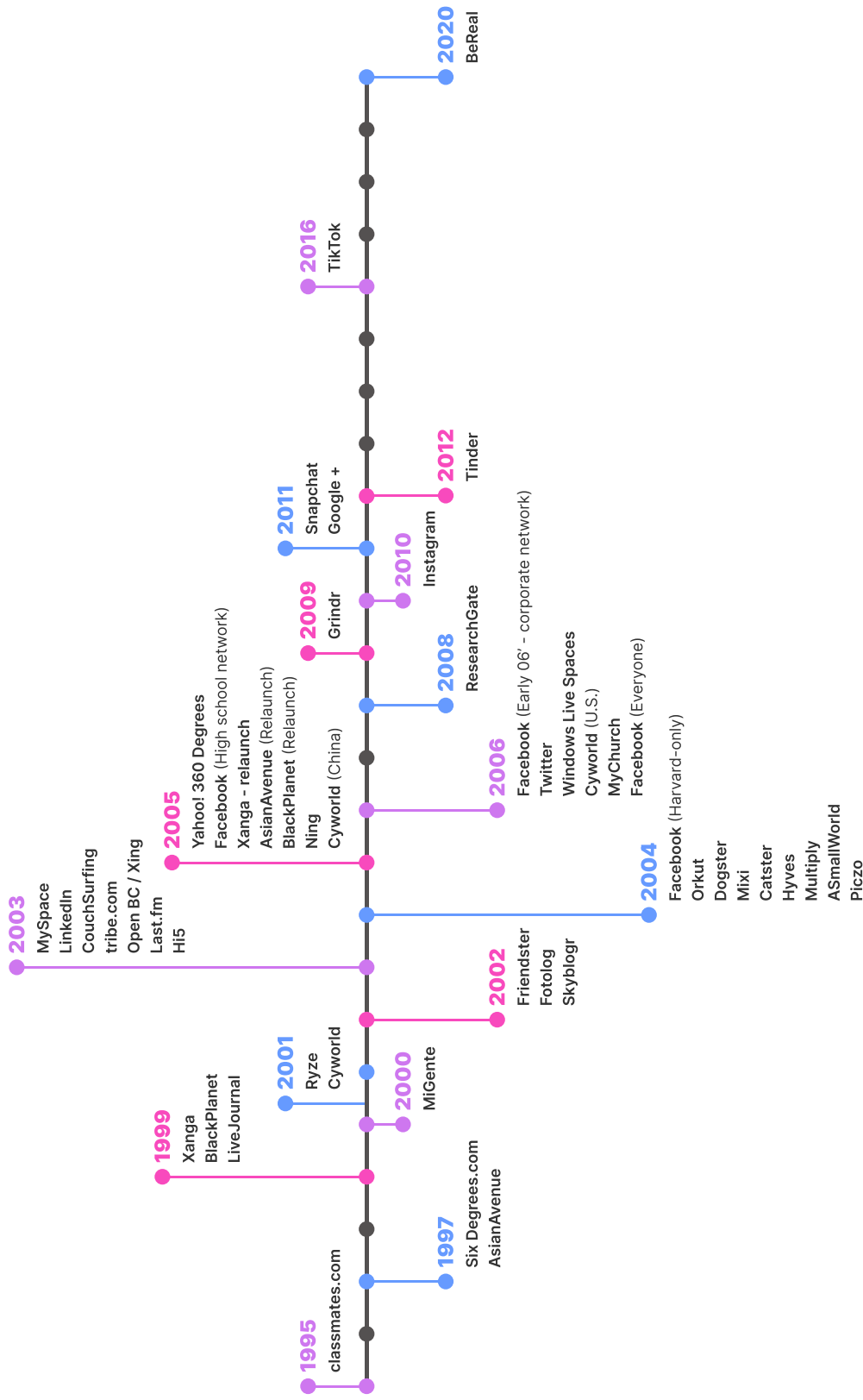
Figure 2.3 Timeline of launch dates of major SNSs

1995
classmates.com

1997
Six Degrees.com
AsianAvenue

1999
Xanga
BlackPlanet
LiveJournal

2000
MiGente

2001
Ryze
Cyworld

2002
Friendster
Fotolog
Skyblogr

2003
MySpace
LinkedIn
CouchSurfing
tribe.com
Open BC / Xing
Last.fm
Hi5

2004
Facebook (Harvard-only)
Orkut
Dogster
Mixi
Catster
Hyves
Multiply
ASmallWorld
Piczo

2005
Yahoo! 360 Degrees
Facebook (High school network)
Xanga - relaunch
AsianAvenue (Relaunch)
BlackPlanet (Relaunch)
Ning
Cyworld (China)

2006
Facebook (Early 06' - corporate network)
Twitter
Windows Live Spaces
Cyworld (U.S.)
MyChurch
Facebook (Everyone)

2008
ResearchGate

2009
Grindr

2010
Instagram

2011
Snapchat
Google +

2012
Tinder

2016
TikTok

2020
BeReal

that contain a maximum of 140 characters (Cross, 2014). In addition, Instagram, one of the most popular sites of today, was established in 2010 and focuses on uploading and sharing pictures and videos like a personal album (Russmann & Svensson, 2016). TikTok, one of the most widely used sites of recent times, which came to life by a China-based company Bytedance in 2016, allows users to create and upload short-spanned videos with diverse filters (Omar & Dequan, 2020). Alternatively, different from the purpose of general use of SNSs, there are several sites focusing on more particular user groups. For instance, as a career-oriented site, LinkedIn was founded in 2003 aiming to extend and pursue professional networks; in other respects, some sites to meet potential partners, such as Grindr and Tinder are an indication of how social network sites could vary (d. m. boyd, 2008a; Miller et al., 2016).

2.1.1.1   SNS Features

Each social network site has its own unique characteristics to connect people, which is due to the differentiation of the purpose of use of SNSs (see Fig. 2.4 and 2.5). For example, Twitter creates user interaction based on textuality on user-generated content, while, on Facebook and Instagram, users communicate through shared posts containing photos and text. Nevertheless, they share several commonalities even though they diverge from each other regarding the key features of SNSs. One of the most significant features of SNSs is the profiles, which present information about individuals or brands that describe who they are (Cross, 2014). The profile page could be considered as a form of user homepage that can consist of expressive materials: profile photo, demographic information (age, sex, location, etc.), interests, and a list of the people within the network, which is named as *Friends*, *Contacts*, and *Followers* on different SNSs (d. m. boyd, 2008a; d. m. boyd & Ellison, 2007). Moreover, the visibility of a profile depends on the SNS and user preference, and users have the freedom to decide to accept or decline requests from others on the same SNS, as well as set their account to the public (d. m. boyd & Ellison, 2007).

2.1.1.2   User Motivations

Every day, millions of people including both individuals, such as celebrities, and social media influencers, who have a wide network of many followers and are seen as having trusted, special and original tastes in one or a number of niches, and public and corporate users sign into their accounts on different social network sites and share information and interact with each other (De Veirman et al., 2017). The rising influential power of social network sites on people's behavior and perception has led brands and organizations to invest more time and money to create content, advertise and promote products in these mediums (d. m. boyd & Ellison, 2007). Thus, the brands could collaborate with social media influencers to increase the visibility of their products (De Veirman et al., 2017; Harrigan et al., 2021), and they also alter social network sites according to their target audiences and marketing strategy.

Features		Facebook	Instagram	Twitter	LinkedIn	TikTok
Profile User's personal page	**Profile Creation**	• Profile picture • Username • Personal information • Interests, tastes, hobbies	• Profile picture • Username • Bio	• Profile picture • Username • Bio • Personal information • Twitter Blue as premium subscription service	• Profile picture • Username • Personal information • Professional experience • Interests • LinkedIn Premium subscription	• Profile picture • Username • Bio
	Profile View	• Profile picture • Personal information • Posts and activities on the platform • Interests, tastes, hobbies • Pages and Groups • Friends	• Profile picture • Username • Bio • Highlights (collection of stories) • User generated contents (posts, reels) • Tagged photos • Followers and followings	• Profile picture • Username • Bio • Personal information • Tweets, media and replies on the platform • Likes • Followers and followings	• Profile picture • Username • Personal information • Professional experience • Activities on the platform • Interests	• Profile picture • Username • Bio • User generated videos • Likes • Saved contents, effects • Followers and followings
Social Networking Building online connections	**Network Names**	• Friends	• Followers	• Followers	• Connections	• Followers
	Network Management	• Add friends • Join pages and groups • Like pages	• Follow • Sync contacts • Connects Facebook friends	• Follow • Sync contacts • Join Twitter Communities	• Follow • Join pages and groups • Follow hashtags • Attend events • Subscribe newsletters • Sync contacts • Invite contacts	• Follow • Add friends • Sync contacts • Invite friends • Connects Facebook friends
Feed A stream of content	**User Feed**	• Facebook News feed	• Following feed • Favorite feed	• Following feed	• LinkedIn feed	• Following feed
	Curated Feed			• 'For You' feed		• 'For You' feed
Content User-supplied media	**Content Types**	• Posts • Facebook Stories	• Posts • Stories • Reels • IGTV	• Tweets	• Posts • LinkedIn Stories	• Short-form videos • TikTok Stories • Sounds
	Content Creation	• Editing tools • Target audience • Tag other users/locations/events • Hashtags	• Filters • Sound effects • Tags other users/locations • Editing tools • Hashtags	• 280-character limit • Editing tools • Target audience • Hashtags	• Post scheduling • Editing tools • Tags other users • Hashtags	• Filters • Sound effects • Video editing tools • Duet • Stitch • Hashtags
Online Interactions Digital exchange between two or more individuals	**Direct Social Interactions**	• Messenger • Voice and video call • Facebook Live	• Direct messaging • Voice and video call • Live broadcasting	• Direct messaging • Periscope broadcast • Twitter Spaces (live-audio conversations) • Twitter Communities	• Direct messaging • Video call • LinkedIn Live	• Direct messaging • Livestreaming
	Asynchronous Social Interactions	• Like • Save • Reactions • Comment • Mention • Share • Repost • Report account/content • Restrict, or Block account	• Like • Save • Comment • Mention • Share • Repost • Add favorite • Mute or Hide content • Filter word/phrase • Report account/content • Mute, Restrict or Block account	• Like • Retweet • Save • Reply • Mention • Mute account/word • Hide content • Report account/content • Block account/keyword	• Like • Repost • Save • Comment • Mention • Mute account/hashtag • Hide content • Report account/content • Block account	• Like • Save • Tag other users/locations • Comment • Mention • Challenges • Download content • Hide content • Report account/content • Block account

Figure 2.4 Main features of five popular SNSs (1)

On the other hand, it is not expected that the purpose of using a SNS for each user is the same. In fact, user motivations could vary depending on both the social network site and the users themselves. In previous studies conducted on social media and user behaviors, investigating user incentives based on the Uses and Gratifications (UGT) theory, which is a popular approach to studying why and how people choose a particular media to fulfill their needs, provides common insight about underlying reasons of users' choice to use or not to use a specific media (Brandtzæg & Heim, 2009; Menon & Meghana, 2021). McQuail, 2010 describes four bases of motivational needs, which are information, social interaction, entertainment, and personal identity in overall mass media, which are also valid and explainable motivational needs for SNSs. Other researches present the users' drivers of selecting and using a social medium as users' desires to find people with shared interests, to feel social belonging in a community and to find a sense of shared identity, to share their experiences and needs, and to build supportive and sociable relationships (Brandtzæg & Heim, 2009). In addition to user-related reasons, the features of SNSs, such as ease of access and usability of the platform or feedback channels could affect individuals while selecting

Features		Facebook	Instagram	Twitter	LinkedIn	TikTok
Discover Finding out new interests and people	**Explore Topics**	• Search new people • Events happening in user's area or online • Explore pages, Marketplace • Watch (music, movies, shows) • Find friends	• Explore & Search • Reels	• Twitter Trends & Search • Find friends • Discover Twitter Lists	• Job search and recruitment • Search connections • Discover groups, events, posts and etc.	• Search • Find friends
	Suggestions	• 'People you may know' • Recommended pages, events • Discover (suggested groups) • Suggested posts in user feed • Suggested Ads	• 'People you may know' • Recommended posts, stories, reels • Suggested Ads	• 'Who to follow' • Recommended topics • Suggested tweets in 'For You' feed • Suggested Twitter Lists • Suggested Ads	• 'People you may know' • Suggested posts in user feed • Recommended connections • Job recommendations • Suggested events, groups • Suggested Ads	• 'People you may know' • Suggested hot topics • 'For you' feed • Suggested Ads
Business Marketing Offering business elevation and growth	**Brand Promotion & Marketing Strategies**	• Business Page creation • Facebook Ads creation • Boosting posts • Sponsored contents on user feed • Setting up a shop for business	• Business Account creation • Instagram Ads creation • Setting up a shop for business • Boosting posts • Sponsored contents on user feed • Find or Become a Business Partner	• Business Account creation • Twitter Ads creation • Boosting tweets and accounts • Sponsored contents on user feed • Twitter Video Resources for better brand promotion • Using Twitter Cards for increasing engagement with the brand	• LinkedIn Business Page creation • LinkedIn Ads creation • Boosting posts and events • Sponsored contents on user feed • Sponsored messaging	• TikTok Business Account creation • TikTok Ads creation • Spark Ads for small businesses (native ad format in TikTok) • Boosting contents • Branded Hashtag Challenges (HTC) • TikTok Creative Exchange for large businesses (finding expert partners for content creation) • Branded Effects for large businesses (custom effects sponsored by brands) • Find a Marketing Partner • Discover TikTok Creator Marketplace (for brand and creator collaborations on TikTok)
	Customer Service	• Messenger for building customer relationships • Insights and Analytics about Facebook Ads, brand's campaigns and shared posts	• Instagram Direct for messaging with customers • Insights and Analytics about Instagram Ads, the business account and shared content	• Twitter customer support channel by DMs and replying mentions • Twitter Analytics about the account, shared content	• LinkedIn Page Analytics for monitoring and optimizing business performance	• TikTok Insights about the account, the target audience, shared content
	Shopping	• Marketplace (selling and buying products from user personal account) • Facebook Shops (selling products from business page)	• Instagram Shops			• TikTok Shops (showcasing and selling products directly on TikTok through in-feed videos, LIVEs, and product showcase tab)

Figure 2.5 Main features of five popular SNSs (2)

a social network site for use (Brandtzæg & Heim, 2009). Another research centralizing on the motives of young adults on MySpace and Facebook (Raacke & Bonds-Raacke, 2008) shows that their main incentives to have an account on these sites are connecting with their old and current friends, establishing new friendships, spending time looking at shared posts and pictures, whereas users' less favorite drives are being informed about events, feeling connected and expressing themselves. On the contrary, the reasons why individuals do not use neither MySpace nor Facebook quite differ due to unwillingness to have an account, thinking of them as a waste of time, lack of time, preferring loneliness, the feeling of invasion, lack of Internet access at their home and being in trouble with technology. As a result, the background of preferring to use or not use SNSs underlies several different reasons. The major motivations of users being engaged in SNSs are to build, preserve and develop social relationships, socialize with other people and get information from events and others, and kill time by checking others' profiles, posts, and pictures. On the other hand, the most possible motives for not engaging with SNSs arise from considering using SNSs as a waste of time, not desiring to be part of that community, not looking for social relationships and lack of technological capabilities.

2.1.1.3   Impacts of Using SNSs

SNSs have become an integral part of our daily lives, and their popularity is constantly increasing worldwide. With the rise of digital technologies, SNSs evolve into a diverse range of applications that influence different aspects of both individuals and society with each passing year. SNSs allow individuals to share and exchange various forms of content, including photos, videos, and messages. They have been beneficial in many ways, such as strengthening social relationships, facilitating communication in education, and promoting commercial activities. However, for all that bright side of SNSs, similar to any other technological innovation, there is a dark side of SNSs that could bring mental, physical, and societal impacts on individuals and society. Indeed, it is necessary to perceive the diverse impacts of using SNSs on society and individuals on all sides to foster user awareness. Hence, in this section, both the positive and negative impacts of using SNSs will be explored.

2.1.1.3.1   Positive Impacts of Using SNSs

SNSs have a significant impact on our daily lives and the use of these platforms continues to increase rapidly in recent years. While there are certainly negative impacts associated with the use of SNSs, which will be discussed later in this section, there are also a number of positive impacts that cannot be ignored. These positive impacts, which may not be as salient and apparent as the negative ones, could shed light on the benefits of using SNSs and encourage users to be more aware of the potential positive impacts of these platforms. Hereby, the section starts with the positive societal impacts of SNSs and continues with the educational impacts of using SNSs. Lastly, the section concludes with the commercial impacts of SNSs.

Societal Impacts   One of the major positive impacts of SNSs is strengthening social relationships. SNSs allow users to enhance their relationships in two ways. Firstly, through SNSs, such as Facebook, Instagram, and Snapchat, users stay connected with their family and friends. To put it another way, bonding social capital that is defined by Putnam, 2000 refers to maintaining strong ties where the emotions of kinship and trust are stimulated. The latter is the other form of social capital named bridging social capital (Putnam, 2000), in which SNSs, such as LinkedIn, enable individuals to establish new networks to exchange information and reinforce weak relationships. In addition to improving social relationships, using SNSs provides information exchange and social support. SNSs make spreading information easier since they have become a tool for gathering and exchanging information through ideas, messages, photos, and videos shared by users. According to a study (Hwang et al., 2010), there are four main types of social support: informational, emotional, appraisal (feedback), and instrumental (tangible), and informational and emotional supports are the most common ones on SNSs (Ballantine & Stephenson, 2011). From this standpoint, Twitter could be an appropriate example, in which individuals find social support from other users who deal with a similar problem. Additionally, Facebook groups could provide

users with social support for meeting other people or just getting information. Moreover, the crowdsourcing phenomenon, which is a practice involving a large group of people to get needed knowledge, ideas, goods, or services, is another positive side of using SNSs (Amedie, 2015). The solidarity on Twitter after the devastating earthquakes hit Turkey and Syria is a good example of crowdsourcing on SNSs. After the incident, Turkish Twitter users shared numerous tweets both to report the earthquake victims' locations under the rubble for search and rescue and to announce and deliver the necessary materials and aid for the earthquake area. Thanks to countless tweets, many people have been rescued from the earthquake rubble and the essential aid was trying to be reached to the cities. Thereby, this disaster showed that social network sites, particularly Twitter, could turn into a platform where the victims raise their voices. Besides, social network sites enable individuals to create and participate in micro-communities; yet more, they open the door to enhance users' self-expression and help to receive social support, especially for those who are part of gender, sexual, or ethnic-racial minority groups thanks to wide network opportunities of SNSs (Fox & Warber, 2015). Hence, using a social network site promotes people to improve their relationships, exchange information, build communities, and meet others for social support.

Educational Impacts SNSs play a great role in the culture of youngsters. The application areas of SNSs are not only limited to enriching networks or strengthening relationships but also have currently involved in the education area. Even more, the integration of digital technologies has gained acceleration in order not to disrupt the education period of students with the atmosphere of the Covid-19 pandemic, and academic persons have sought new solutions to proceed with their lessons online and communicate with their students (Kara et al., 2020). Therefore, essentially, students, teachers, and instructors use SNSs to keep in touch with each other and share information. However, in addition to that, SNSs provide students with the opportunity to collaborate and interact with others. For example, ResearchGate allows users to share publications and find collaborators for asking questions or support, whereas graduate students use LinkedIn to enrich their professional career-centered networks (Rasheed et al., 2020). In addition, the adoption of SNSs as a tool for the educational system has increased the student's motivation to participate in lessons and group discussions, which affects students' academic performance positively (Rasheed et al., 2020).

Commercial Impacts With the increasing influence of SNSs on individuals over the years, SNSs facilitate brands and companies to increase their performance in several ways by serving as an important platform where they promote their products and find new customers, apart from individual uses. Brands make their products, and services more visible by placing advertisements on SNSs; even further, they adapt different business strategies to maximize their profit: (i) generating creative ideas, and content to be shared via SNSs in order to present their brand identity and reach out larger

audiences; (ii) connecting with their clients, and other professionals who can help them to improve their business through business-oriented SNSs, particularly LinkedIn; (iii) analyzing likes and dislikes on the shared contents to better understand their audiences (Siddiqui & Singh, 2016). Another positive impact of SNSs is increasing the visibility of small businesses with limited budgets, and helping them to grow their brands.   Furthermore, companies have an opportunity to maintain customer relationships in more direct communication through SNSs. According to a study (Hajli, 2014), social interactions occurring on SNSs, such as giving ratings, reactions, and reviews, allow consumers to receive informational and emotional support from others and share their opinions which can be influential on other users' decision-making behaviors.

2.1.1.3.2   Negative Impacts of Using SNSs

After discussing the positive impacts of SNSs, now it is time to examine that there are also negative impacts that can arise from SNSs use. These negative impacts can be particularly concerning when it comes to the physical and mental health of users, as well as the broader societal impacts that SNSs can have. In this section, the physical and mental impacts that SNSs can have on individuals, including young adults are, first mentioned. The section then moves on the negative societal impacts of SNSs, including changes in social norms and behaviors, and social relationships.

Physical and Mental Impacts   Many research revealed that using SNSs could spark physical and mental issues in individuals, particularly in younger generations, who are more vulnerable to harm than adults. Since the primary issue of using SNSs is the need for users to introduce themselves to other people in the community, a study by Tiggemann and Slater, 2013 with the participation of 1087 girls aged between 13 and 15 indicates a distinct correlation between using SNS, and body image and self-esteem. In fact, according to that study, 75% of the participants who are regular users of Facebook stated that they are highly concerned about their body image. Therewith, users are more prone to compare themselves with their friends, peers, and even celebrities.   Moreover, the results of another research demonstrate that adolescent women using Facebook are quite distressed body dissatisfaction and have a greater drive for thinness, which yields to low self-esteem, dieting behaviors, and eating disorders (Fardouly & Vartanian, 2015; Holland & Tiggemann, 2016). Likewise, spending a lot of time using SNSs decreases the quality of life and well-being of individuals, particularly their self-esteem (Kross et al., 2013); in addition to the time spent on SNSs, Richards et al., 2015 state that receiving negative feedback on users' Facebook profiles reduces the level of self-esteem, which most probably brings about the tendency of having more Facebook friends.

Another prevailing dispute among the researchers is whether the use of SNS may have either a positive or negative association with depression and anxiety. In one respect, using SNS may bring social support and connection, which could help users to foster positive mental well-being. In other respects, SNSs may influence an individual's mental health in an unfavorable way through the potentiality of miscommunication and the misuse of the SNSs features. A review by Seabrook et al., 2016 puts forwards ten diverse determinants that have either a positive or negative correlation with depression and anxiety: the frequency of SNS use, the size and structure of the social network, language features and observable SNS activities (seeing the number of likes and comments), self-disclosure and expression, the quality of interactions on SNSs, social connectivity, social support, social comparison, the addictive and problematic SNS use and physiological associations. Besides, according to that research, among these factors, the higher frequency of social comparison, SNS addiction and problematic uses of SNS, and negative interactions, such as cyberbullying, are considerably linked with high levels of depression and anxiety. Further, even though social support and sustaining strong social connections, and positive quality of interactions are less likely to be associated with causing depression and anxiety, particularly individuals who already suffer from depression could be affected negatively due to the inconsistency between the reality of the content and the perceptions of interaction quality (Seabrook et al., 2016). As a side note, the term Facebook depression, which was propounded by researchers in the early era of social media, describes showing archetypal symptoms of depression when preadolescents and adolescents spend enormous amounts of time on SNSs. With the feeling obligated to get acceptance by their peers in the world of SNSs, the youth could be affected by depression, which may sometimes bring social isolation, drug abuse, aggressive or self-harming behaviors, and high-risk sexual behaviors (O'Keeffe et al., 2011). As another intersecting effect of SNS use with depression and anxiety, people with psychopathological symptoms use SNSs with the intention of running away from their negative feelings and taking gratification, but this may yield an increase in SNS addiction and problematic SNS use (Oberst et al., 2017).

On the other hand, there is a duality in SNS; that is, SNS facilitates individuals to connect, share with and know more from their friends, family, and peers. However, using SNS also causes negative experiences. Yet, users are unable to leave off using SNS despite all the negativity of SNS use mentioned above since they are wrecked with the fear of missing out, which is a popular concern that others could be experiencing fulfilling moments, while the one is away (Fox & Moreland, 2015; Przybylski et al., 2013). As claimed by Przybylski et al., 2013, their study evidence that fear of missing out is negatively related to one's general mood and overall life satisfaction. Further research asserts the negative correlation between individuals who have an issue of fear of missing out and their level of anxiety; in other words, those who feel they are missing out on important shared moments are more likely to be exposed to higher anxiety risk (Oberst et al., 2017). Eventually, although SNSs have

been developed to provide a wide range of benefits to individuals, these advantages could turn into adverse outcomes on the contrary and reinforce physical problems, such as eating disorders, and mental concerns including lower self-esteem, anxiety, depression, and fear of missing out the momentous instants.

Societal Impacts   While SNSs encourage individuals to get in touch with other people on the site, on the other hand; the non-negligible fact is that social interactions that emerge on the sites could also bring disadvantageous outcomes in social norms and behaviors and the social relationships of users.

First and foremost, with the acceleration of online social engagement, there is a shift in social behaviors and norms. Rather than communicating face-to-face, users contact each other over the new interaction opportunities of digital technologies, such as tweeting, communicating via DMs, and commenting and reacting through the shared content (Turkle, 2011); that has become a new normal for how people build a relationship. To amplify the statement, average iGen adolescents in the U.S. spend less time on face-to-face social interactions and perform more online interactions with their peers compared with adolescents in the past (Twenge et al., 2019). Another study by Pouwels et al., 2021 shows a within-person level, which is the decrease in the genuineness of friendship in adolescents, with an increase in their social network engagements based on their social norms. In other words, the use of SNSs could lead to the displacement or removal of in-person social interactions and weaken friendships. Besides, virtual connections might offer a delusion of intimacy in terms of social relationships. According to Valkenburg and Peter, 2009, 2011 with social network use, young adults might become more comfortable while disclosing their personal information to their online friends due to diminishing social cues in the SNS interactions. Notwithstanding that, this hypothesis proposes an increase in finding social support and enhancing the closeness of friendships, it also makes the boundary between genuine friends and acquaintances indistinct since users are inclined to follow and interact with more and more people on these sites. Therefore, users experience a false intimacy with weak ties through the disclosure of a lot of personal information on SNSs. Indeed, this could create bigger problems such as privacy concerns and the lack of control over their information (Fox & Moreland, 2015).

Within the frame of changes in social norms and behaviors, SNSs have brought about a new way of determining the value of popularity based on the size of the user network and the number of likes that users have obtained. This creates a competitive environment among young adults, where they strive to get more likes, and thus, improve their self-worth; however, the hunger to be appreciated and acknowledged could yield to a need for attention-seeking behavior including fostering reckless and aggressive actions, one of the outcomes is cyberbullying, which is the intentional use of social media platforms to perpetuate false, humiliating or offensive information about other people (Cookingham & Ryan, 2015; O'Keeffe et al., 2011). Thereby,

cyberbullying, in addition to causing mental problems for victims of cyberbullying, could also be socially detrimental and even more prevalent due to the ease of producing and spreading cyberbullying on these sites. Besides, SNS are abused as a medium for a wide spread of cybercrimes, which come direct and malicious conclusions, over and above cyberbullying: online harassment, online stalking, identity theft, cyber fraud, child abuse, cyber terrorism, phishing attacks, online illegal surveillance and cyber spying (Fox & Moreland, 2015; Vallor, 2012).

Another facet of how SNS use could affect social norms and behaviors is the promotion of risk-taking behavior. Social norms develop in the progress of time and adapt to the culture of society, and the ones that are common and normal now may have been considered unconventional and inappropriate for a particular culture many years ago; moreover, from a psychological point of view, scientists indicate that how people perceive their peers' actions has an impact on behaviors of people (Cookingham & Ryan, 2015). In this perspective, through the contents, and photos shared by the peer, adolescents could normalize the behavior of the peer, which is especially for risky sexual behaviors, and become more inclined to get involved in that peculiar behavior. A study by Young and Jordan, 2013 shows that college students who viewed sexually provocative content on Facebook perceive that their friends participate in highly risky sex practices, such as not using condoms or intercourse with persons that they do not know. Likewise, further research revealed that displaying partying or drinking images on SNSs increases smoking and consuming alcohol in youngsters, which prominently highlights the online peer influence of unsafe actions exposure on adolescent behavior (Huang et al., 2014). Consequently, high-risk behaviors presented on SNSs, including not only sexual behaviors but also valid for substance use and violence could support similar risk-taking behaviors in other adolescents and also promote them to be acknowledged as 'normal' behaviors (Cookingham & Ryan, 2015).

Other than these adverse effects of users being more connected to social networks, yet another disadvantageous consequence originates from social comparison, which is damaging social relationships. The source of social comparison may diversify in various ways over individuals, beginning with the number of friends, which could be an indicator of how popular a user is, and extending to published content itself, which provides an impression of their friends' lives; ultimately, this comparison turns out the feelings of dissatisfaction and jealousy (Fox & Moreland, 2015). In addition, SNSs have a salient impact on romantic relationships, as these sites allow users to share their relationship status and communicate with and about their partners. In their study on the role of SNSs on romantic relationships, Utz and Beukeboom, 2011 identified three SNS properties for the reasons of this influence on romantic relationships: (i) SNSs disclose a great amount of information about the partner, including their daily activities and even information about the partner's friendships; (ii) thanks to SNSs, users may monitor the actions of their partners; and lastly (iii), SNSs makes

information related to the emotional affair visible to others, which can result in an increase in jealousy feelings due to the partner's activities. Additionally, the study conducted by Fox and Moreland, 2015 reveals that the features of Facebook, such as perpetuating history and displaying potential connectivity are exploited by users to monitor a candidate partner or to self-compare themselves to ex-partners of a romantic interest. For this reason, this toxic surveillance of partners may also damage the maintenance of the relationship, and the feeling of jealousy that derives from any reason may result from the user's lack of trust in their partner and their romantic affair, which harbors users to utilize SNSs as an agent for social comparison and behavior monitoring.

As a result of all these positive and negative effects, it shows that the use of SNSs cannot be evaluated by one dimension. While the sites contain features that could provide social support and improve social relationships, spending a lot of time engaging in these sites might cause several physical and mental problems, the deterioration of social relationships, and change in social norms and behaviors. Hence, making an assessment by bearing in mind that social networks are complex artifacts with both beneficial and unfavorable outcomes to users may yield the development of a better understanding and utilization of SNSs.

2.2   Artificial Intelligence

The birth of the AI field dates back to the 1950s. *Computing Machinery and Intelligence*, published by Alan Turing on computer intelligence in 1950 in Mind, lays out the test for computer intelligence, which is called the *Turing Test* or *Imitation Game* (Turing, 1950). With the test, he desired to question "Can machines think?". The Turing test basically involves three participants, one human interrogator, one computer to answer questions, and another human participant to answer questions as well. The criterion of the computer to pass the test depends on the fact that the human interrogator cannot determine whether the answers to the questions come from a machine or a person (Russell & Norvig, 2010). In other words, it is not interested in giving a correct answer to the question. In addition, during the test, all the participants are isolated from each other, and the interrogator does not see, hear or touch other participants, they direct the questions only in the textual form (Turing, 1950) so that the computer's answer would not be dependent on physical simulation of the interrogator (Russell & Norvig, 2010). As a result, this influential work by Turing is considered a significant initiation of the development of the AI discipline. However, the term artificial intelligence was coined by John McCarthy in 1956 as a field of computer science aiming to study and develop intelligent machines that are able to mimic human intelligence (Pannu, 2015). Although several other terms have been tried for the branch, such as complex information processing, machine intelligence,

heuristic programming, and cognology, the term artificial intelligence has received universal acceptance by virtue of its widespread use in journals, conferences, textbooks, and university lectures (Nilsson, 1998).

Over the years, the definitions of artificial intelligence have also varied, and Fig. 2.6 shows some of the definitions of artificial intelligence complying in two main dimensions. The rows are about the systems' concerns, *concern with thinking and reasoning* and *concern with acting*, whereas the columns are related to systems' success measure, *fidelity of human performance* and *rationality*. According to the study by Russell and Norvig, 2010, the emergence of different AI definitions is due to the pursuit of different approaches. The first approach is the cognitive modeling approach, where its arguments are built on by focusing on how humans think and how the human minds work, and the experimental techniques from the field of cognitive science, such as psychology, are derived to develop theories that could think humanly. Hence, the close relationship between AI and cognitive science has led to rapid advancements in both fields, especially in the areas of natural language and vision. Second of all is the acting humanly approach, which the Turing test contributed to initiate this approach. Besides these two human-centered approaches, there are two rationality-centered approaches. The first one is the rational thinking approach, whose principles are rooted in the field of logic, however, the approach could have a handicap in solving a problem in practice than in theory since the taken information might not be easy to transform into the formal terms in logic notation. The latter and last approach is the rational agent approach, studying the development of computer agents, which are different from ordinary programs and have other attributes to control, perceive the environment, and act based on this. As a result of these four AI approaches, it is apparent that there is a conflict between the human-centered approaches and rationality-centered approaches, and human-centered approaches are an empirical science including hypothesis and experimental confirmation from human-centered approaches, while the rationalist ones are comprised of both mathematics and engineering (Russell & Norvig, 2010). In addition, having several AI approaches leads to the differentiation in the artificial intelligence goal as scientific and engineering goals. The scientific goal of artificial intelligence is to define various types of intelligence, while the engineering goal of artificial intelligence concerns finding answers to real-world problems (Winston, 1992).

Yet, despite the production of a wide variety of and often conflicting AI approaches, these approaches have persisted to challenge and improve each other at the same time (Nilsson, 1998). Consequently, over the past few years, artificial intelligence has evolved, and, now, rather than generating completely new theories, it is more frequent to extend the existing ones, to justify claims with accurate theorems and hard experimental evidence rather than with intuition, and to reveal a connection to real-world applications (Russell & Norvig, 2010). Therefore, in a broader aspect,

objective		
	Fidelty to Human Performance as a success measure	**Rationality** as a success measure
Concern with Thinking and Reasoning	**Systems thinking like humans** "The automation of activities that we associate with human thinking, activities such as decision-making, problem solving, learning..." (Bellman, 1978) "The exciting new effort to make computers think ... machines with minds, in the full and literal sense." (Haugeland, 1985)	**Systems thinking rationally** "The study of mental faculties through the use of computational models." (Chamiak and McDermott, 1985) "The study of the computations that make it possible to perceive, reason and act." (Winston, 1992)
Concern with Acting (Behaviors)	**Systems acting like humans** "The art of creating machines that perform functions that require intelligence when performed by people." (Kurzweil, 1990) "The study of how to make computers do things at which, at the moment, people are better." (Rich and Knight, 1991)	**Systems acting rationally** "Computational Intelligence is the study of the design of intelligent agents." (Poole et al., 1998) "AI ... is concerned with behavior in artifacts.." (Nilsson, 1998)

application to (left margin)

Figure 2.6 Four AI approaches with several AI definitions (adapted from Russell and Norvig, 2010)

artificial intelligence could be defined as a branch of computer science and technology, and the study is to create intelligent machines and computer programs with functions that are attributed to humans, such as perceiving, reasoning, and acting, to achieve great performance for the given tasks (Pannu, 2015; Winston, 1992).

2.2.1   AI Application Areas and AI Techniques

In the current world, artificial intelligence has stepped in to resolve difficult, practical problems in many application areas from engineering to the health sector, from transportation to business, which has undoubtedly brought about the development and use of diverse AI techniques. However, as a matter of fact, the Turing test also has a great impact on the techniques that are applied in artificial intelligence. In spite of being a pioneer in the AI field, with the Turing test, Alan Turing has tried to define six fundamental elements that the computer needs to have human-like thinking as follows (Russell & Norvig, 2010):

- *Natural language processing (NLP)*, allowing computers to communicate in English,

- *Knowledge representation*, needed for preserving what the computer knows or hears,

• *Automated reasoning*, essential to use the stored information while making decisions and answering the given tasks,

• *Machine learning*, for the adaptation of computers to new conditions and for the notice and interpretation of patterns within the condition,

• *Computer vision*, the capability of perceiving objects, and lastly,

• *Robotics*, enabling computers to manipulate objects.

In fact, even though these six factors were propounded by Turing more than 70 years before, they are still valid and AI researchers have put their effort to examine principles over the years. As a solid proof of this and based on some reliable sources, the primary areas in the thriving field of artificial intelligence could be gathered under several sub-fields, which are natural language and image processing, machine learning, robotics, automated reasoning, computer vision and pattern recognition, and knowledge representation (Bishop, 1995; Jain et al., 1996; Pannu, 2015).

Moreover, as a point worth mentioning once more, artificial intelligence is an interdisciplinary field including various disciplines, such as mathematics, biology, psychology, linguistics, and engineering, as a result of this, the techniques that are used in artificial intelligence could vary widely in order to reach successful AI systems (Nti et al., 2022), which has brought the development of AI techniques and models that have been generated and advanced from the existing principles from other disciplines. One of the most common examples is the artificial neural network (ANN), which is inspired by the human brain. The application areas of ANNs extend from diagnosis of hepatitis to facial recognition to speech recognition (Abiodun et al., 2018). The ANN systems, which are the biological simulation of the sophisticated functionality of the human brain, focus on improving the intelligent systems' ability to learn (Nilsson, 1998). The human brain consists of hundreds of billions of neurons to make the decision-making; likewise, an artificial neural network is a collection of three layers of interconnected multi-neurons, known as nodes or units as well. The first layer is named the input layer, while an ANN contains one or two hidden layers, sometimes it could even have three hidden layers, and the final layer is the group of output neurons (S.-C. Wang, 2003). As shown in Fig. 2.7, which is a simple architecture of an ANN, through the information process in ANN, data enters from the input layer and continues to pass other layers until reaching the output layer (Abiodun et al., 2018). With the design of ANN, the aim is to unfold a lot of computational problems in pattern recognition, prediction, optimization, associative memory, and control (Jain et al., 1996). Fuzzy logic, evolutionary computing, and hybrid AI are some other important techniques that are applied in AI (Pannu, 2015).
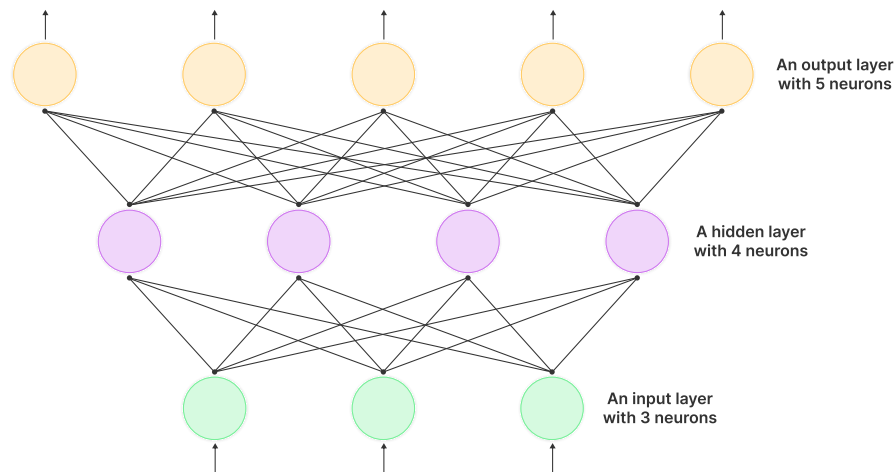
Figure 2.7 A simple architecture of an ANN

2.2.2   Machine Learning (ML)

Machine learning and artificial intelligence are often used interchangeably; nevertheless, these two terms are not the same concept, and their usage and meaning are quite different from each other (Kühl et al., 2020). In *Artificial Intelligence: A modern approach*, Russell and Norvig, 2010 mention that computers, as learning agents, require a performance element to make a decision to take actions and a learning element to alter the performance element to get more successful results. Therefore, computer scientists have aimed for computers to acquire the learning ability inherent in humans since the 1950s, and the research on both learning and performance was related to enhancing approaches and techniques for cognition, perception, and action because of perceiving learning as a primary property of intelligent systems (Shanahan, 2000). Hence, machine learning is considered a subset of artificial intelligence, and its major objective is to study how human learning activities could be reproduced by computers and to probe methods that computers acquire new knowledge and skills, recognize existing knowledge, and make constant progress to reach better performance (H. Wang et al., 2009). Besides, machine learning is subject to dealing with larger, complex tasks of real-world problems, which causes focusing on the most relevant information in huge amounts of data has become a highly serious challenge, for this reason, machine learning includes a set of techniques that are helpful for computers to learn how to solve the complicated problems rather than to be entirely programmed (Blum & Langley, 1997; Kühl et al., 2020) (see Fig. 2.8).

Therefore, in order to solve these large and complex problems, machine learning contains a group of techniques called deep learning (DL). Deep learning methods consist of lots of modules with a multilayered structure and a large number of variables, whose most of the modules are prone to learn and calculate input-output mappings in a non-linear way (LeCun et al., 2015). The main difference between deep learning and artificial neural networks is that the architecture of deep learning has
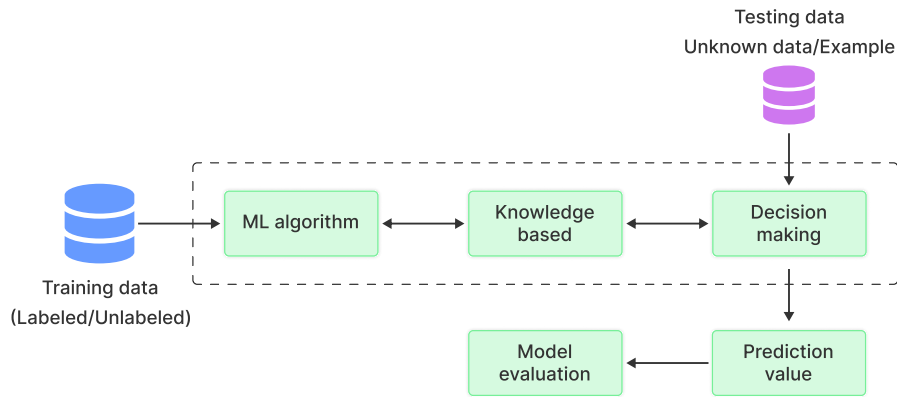
Figure 2.8 A basic machine learning system

more modules (neurons), which makes it a more complex method and enables the system to more powerfully compute for training and to automatically extract features (Abiodun et al., 2018). Some deep learning applications examples are object detection in images, speech recognition, and text and document classification (Shinde & Shah, 2018).
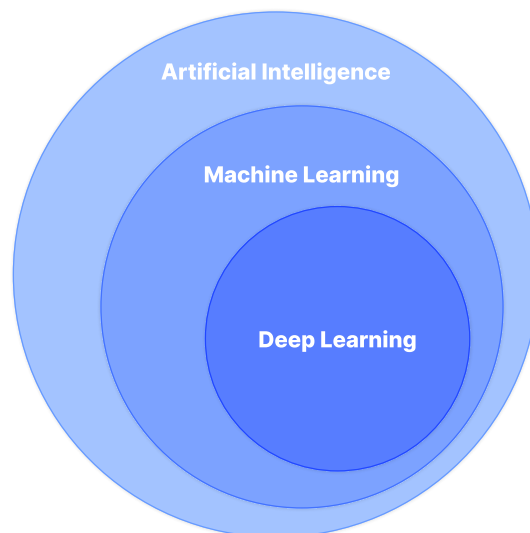
Figure 2.9 An overview of artificial intelligence

Furthermore, even though machine learning falls under the umbrella of AI, and thus, it intersects mainly with computer science and statistics, other related disciplines such as psychology, biology, economics, and some other disciplines have a significant influence on the development of machine learning (Jordan & Mitchell, 2015) (see Fig. 2.9). With the growing interest and recent progress in machine learning, different ML techniques could be found in so many application areas from manufacturing to marketing. As an example, according to the work mentioned by H. Wang et al., 2009, the application areas of machine learning have been spread to an extensive range in the use of marketing, finance, telecommunication, and network analysis. In the marketing sector, ML techniques are commonly used for the tasks classification; the finance sector uses ML techniques in tasks of forecasts; the sector of network analysis

uses ML techniques in the relating tasks; and in the telecommunication sector, ML techniques have widespread use in the tasks of classification, prediction, and spying (H. Wang et al., 2009). Likewise, in these different application areas, numerous machine learning algorithms have been developed to process a wide range of data and to resolve diverse types of complex problems (Jordan & Mitchell, 2015).

Machine learning is traditionally divided into three main categories supervised, unsupervised, and reinforcement learning based on the type of feedback because the feedback type for learning is usually regarded as the most critical characteristic while choosing the nature of the computer's learning problem (Russell & Norvig, 2010) (see Fig. 2.10).
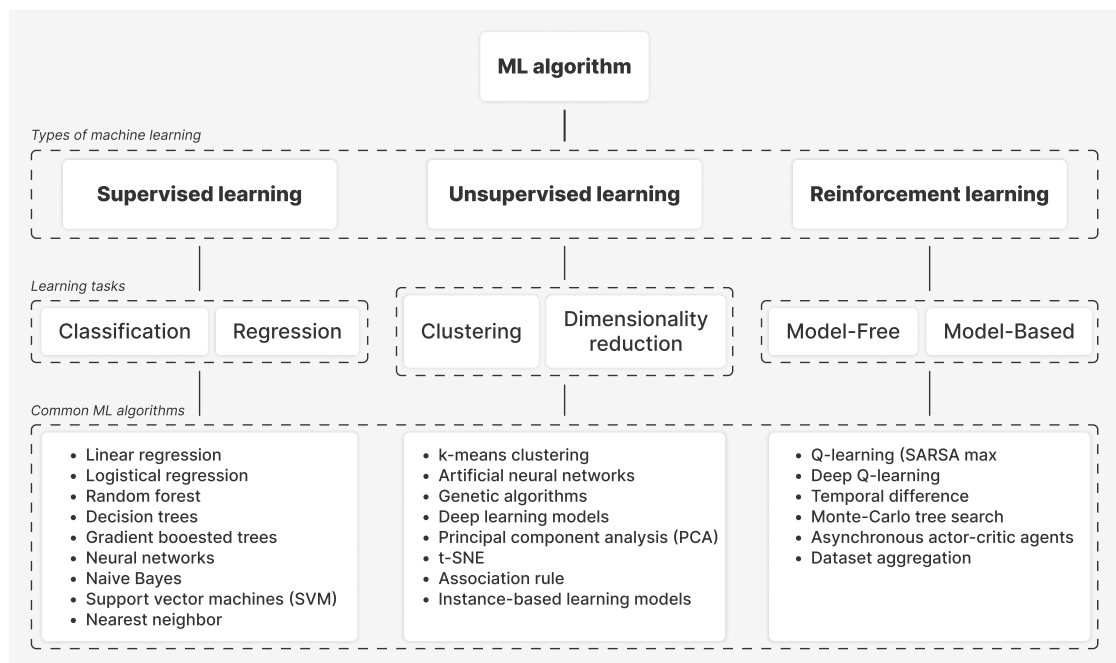
Figure 2.10 The taxonomy of machine learning algorithms

Supervised learning is related to learning a function through past experience, in other words, through using a set of examples so that the system can build knowledge about given tasks (Mitchell, 1997). In supervised learning, with a training dataset, a prediction model, or a good learner, which is one that makes accurate outcome predictions, is created to observe a set of objects, which allows foreseeing the outcomes for new unperceived objects (Hastie et al., 2009). Besides, decision trees, random forests, logistic regression, support vector machines, neural networks, kernel machines, and Bayesian classifiers are some common methods in supervised learning and as a concrete example for supervised learning methods, spam classifiers of email, face recognizers over images, and medical diagnosis systems could be counted (Jordan & Mitchell, 2015).

Unsupervised learning is the type that learns patterns in the input when there is no specific label in the input that provides a value for the output (Russell & Norvig, 2010). Broadly, in unsupervised learning, ML algorithms analyze the unlabeled data and try to make an inference about the unseen structural properties of data with the help of approaches of algebraic, combinatorial, or probabilistic (Jordan & Mitchell, 2015), so, there is no error feedback signal that could enable evaluating the output. The clustering problem is included in unsupervised learning, which aims to group objects with similar properties in the lack of error feedback.

Reinforcement learning is one of the most promising and popular areas in machine learning. Once more, as noted in the work conducted by Jordan and Mitchell, 2015, unlike unsupervised learning, in reinforcement learning, there is feedback only as a sign of whether or not it is a correct action for a given input. Beyond that, there is an agent, which makes predictions through the method of trial-and-error so that the agent can learn what action to take for a given task by considering the dynamic environment. Two basic policies could be followed for resolving the problems of reinforcement learning. The first one is exploring the actions in order to determine the one that has better performance in the environment, whereas the latter is related to benefiting from statistical techniques and dynamic programming approaches to evaluate actions that are taken in the environment (Kaelbling et al., 1996). The use of reinforcement learning algorithms is widespread in real-time decision-making, machine skill acquisition, and robot navigation (Sharma et al., 2020).

2.2.3   AI Applications on SNSs

Social network sites consist of various AI applications, which could be gathered into two groups: internal (embedded) AI applications on SNSs and external AI tools on SNSs. However, the different uses of AI applications on SNSs lead to dispute ethical issues on SNSs depending on several aspects, such as privacy, transparency, race, class, and gender. Here, firstly, the two groups of AI applications are explained with the help of some examples from SNSs and, subsequently, the ethical aspects of the use of AI on SNSs are presented by following several case studies from Facebook and TikTok.

2.2.3.1   Internal (Embedded) AI Applications on SNSs

Each social network site offers diverse AI applications that improve the usage according to its intended use and foster the user to use that site. The most frequent ones could be listed as personalization of user experience based on preferences, interests, and attitudes; spam detection and filtration; detecting and removing harmful content; and social media chatbots and virtual assistants.

2.2.3.1.1   Personalization of User Experience Based on Preferences, Interests, and Attitudes

Facebook News Feed Facebook had 2.96 billion monthly active users as of September 2022 from Meta Reports Third Quarter 2022 Results (Meta, 2022), which means that there are numerous potential contents that could be shown in the feed of each user. Therefore, Facebook has a system that ranks the contents to determine which one is more meaningful and relevant for each user and in what order they should be presented. For this reason, this ranking system utilizes the combination of machine learning models that consists of complicated multi-layers with the calculation of several variables, such as user interactions and content characteristics so that the ML can evaluate candidate posts and personalize each user's feed accordingly (Lada et al., 2021). As the ranking system starts to score the candidate posts, the thousands of posts are reduced to the hundreds of posts to be presented in one's News Feed at any given time.
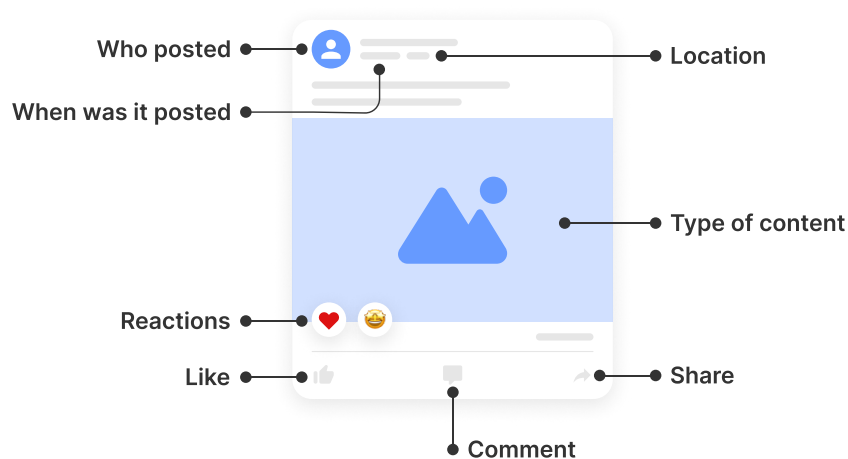
Figure 2.11 Signals used to determine the ranking score of a post

The process of the News Feed Ranking system depends on four factors. The first is inventory which is all the possible posts that could be shown in the user feed, such as photos and videos of friends, advertisement posts, or posts from the groups that the user is involved in (Meta, 2021). The system evaluates some signals that are present in each post (who posted it, how has the user engaged with the owner of the post recently or what is the type of the post, is it a video/photo/link) to predict the most relevant posts for that user (Lada et al., 2021) (see Fig. 2.11). Based on these signals, the algorithms assign a score to each post in the inventory, and posts with higher scores are most likely to be meaningful for that user and appear higher in the user's feed (see Fig. 2.12).

The second factor influencing News Feed Ranking is the user's option to customize their feed through *News Feed Preferences*. For example, the user can choose up to 30 people as Favorites, which scores the favorites' posts higher and gives those posts precedence in the feed; in addition to this, another preference is called *Most Recent Tool*, which allows users to see posts in a chronological order (Meta, 2021). Thirdly, Facebook offers a survey, which includes the option *Show More/Show Less*, to get direct feedback from
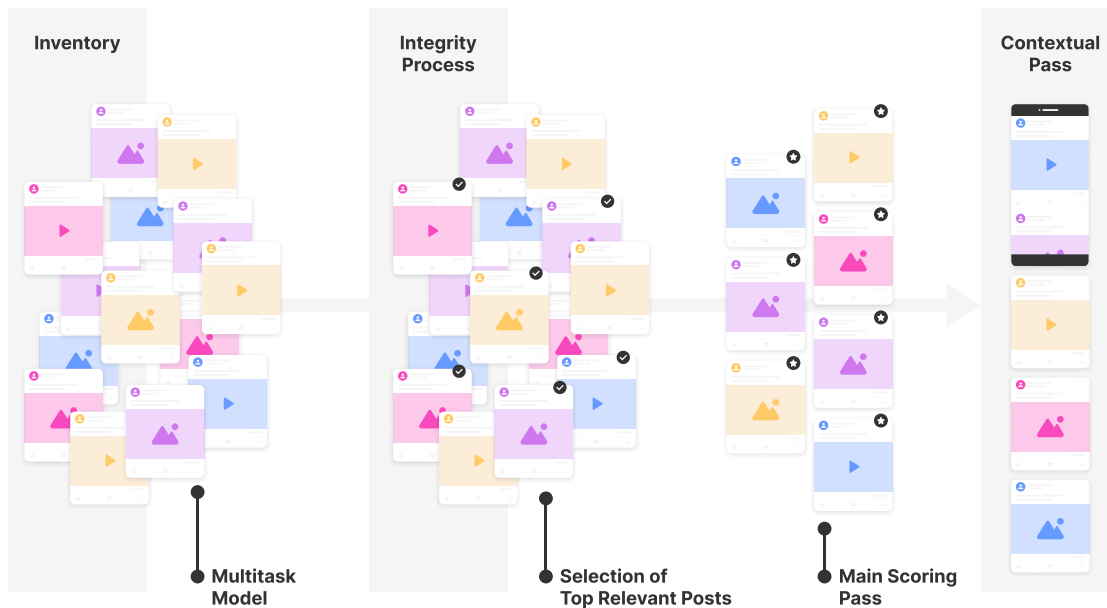
Figure 2.12 General scheme of Facebook News Feed

the user about the post, and according to the answer, the system changes the score for that post and other similar contents (Meta AI, 2022). Lastly, content that breaks the Facebook policy standards, such as containing hate speech and graphical violence, gets lower ranking scores and is demoted in the feed (Meta, 2021) (see Fig. 2.13).
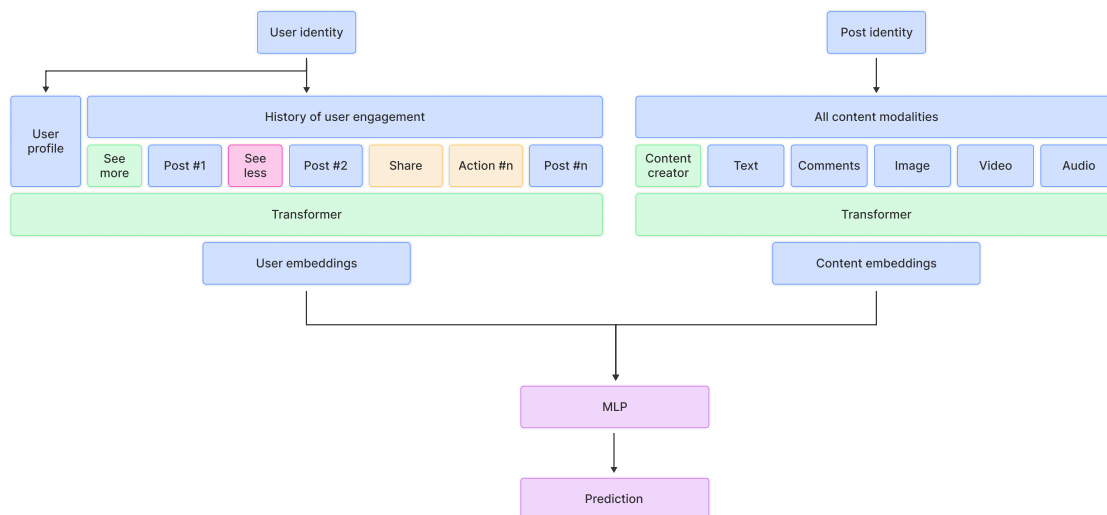
Figure 2.13 Neural network architecture of Facebook News Feed using deep learning models

LinkedIn's Talent Search and Recommendation Engine   LinkedIn is a platform designed to build connections between job seekers and job providers and vice versa. In order to recommend suitable job opportunities to their users, LinkedIn uses an AI-powered engine called LinkedIn's talent search and recommendation system, which could be split into two main parts: an online system and an offline workflow (Geyik

et al., 2018). The process of the online system starts with forming a query that is the integration of the recruiter's search request and some text keywords, such as skills, canonical titles, and company name, which is transmitted to the LinkedIn Galene search engine (Sankar & Makhani, 2014) (see Fig. 2.14). Subsequently, machine learning models rank a candidate group of search results according to the set criteria, similar to Facebook's case. As a final step, the front-end server collects the top-scored candidates, builds the result page, and records the recruiter interactions. On the other hand, the offline workflow enables making updates on different machine-learned models by regularly training the ranking model with recruiter interaction logs including job seekers' answers to recruiter messages (Geyik et al., 2018).
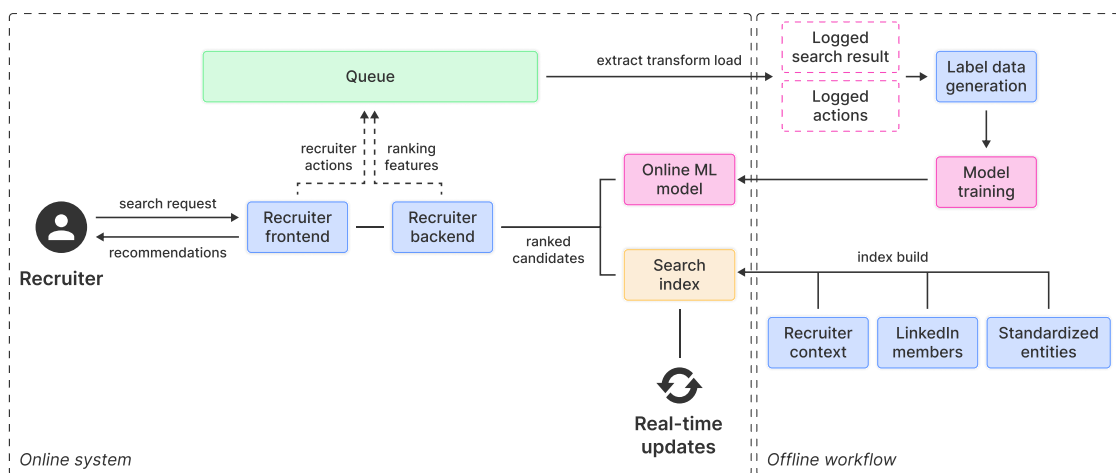
Figure 2.14 LinkedIn's talent search and recommendation system

Instagram Feed Instagram as a platform allowing users to upload photos and videos requires the collection of diverse user data and the use of several ML algorithms to provide their users with personalized feeds. Although Instagram does not explicitly publish how the algorithms work, it keeps track of data about the user activity, such as how many posts the user has liked, saved, shared, or how often the user has visited the profile page of others' accounts (Saraco, 2022). However, there are six major ranking factors that change the users' Instagram feed (Jarboe, 2021):

- *Interest:* Instagram tracks what the user interests are according to their past interactions on similar content, and to predict what the user cares about and to rank posts, possibly uses machine vision to examine the content of the post.

- *Recency:* is about how recently the post was shared, Instagram prioritizes recent posts rather than old ones.

- *Relationship:* Instagram also keeps track of data on the accounts that the user interacted with, how they have a close relationship, so the accounts that the user has interacted with frequently in the past, such as by liking, commenting or being tagged, are most likely to have higher ranks in the user feed.

- *Frequency:* The Instagram ranking system also depends on how often the user opens Instagram to present the best posts since the user's last visit.

- *Following:* The number of the account the user follows has an impact on the user feed as well, Instagram selects posts from a broader range of accounts if the user has a lot of followings, which decreases the possibility of seeing a post from a particular account.

- *Usage:* The time being spent on Instagram determines which posts the user sees at the higher rank on their feed. During short sessions, the user sees the best posts, whereas, during long sessions, the user has an opportunity to go deeper into their feed and explore more posts.

Apart from these factors, the content that does not follow Instagram's community guidelines is lowered in the feed. Similarly, if the user mislabels a post, Instagram drops the post back in the feed as well. Even further, in March 2022, Adam Mosseri, who is the current head of Instagram, published two new features on Instagram feed, which enable users to personalize their feed as following or favorites (Saraco, 2022). Following chronologically shows posts from the accounts that the user has followed in the feed; on the other hand, in favorites, the posts from the accounts that the user interacts with more frequently appear at the top of their feed.

2.2.3.1.2 Spam Detection and Filtration

Twitter Spam The huge popularity of Twitter as a platform for sharing opinions and posting messages establishes a ground for spammers and scammers to spread so many tweets containing baleful links redirecting people to external websites that contain malware downloads, drug sales, scams, or phishing. The problem of these types of attacks is not only worsening the user experience but also their unfavorable consequences could reach stopping all Internet services from working (Abisha et al., 2019). Therefore, for spam detection, logistic regression, decision tree, random forest, multinomial Naïve Bayes, support vector machine and Bernoulli Naïve Bayes are the most common machine learning models, whilst, logistic regression, random forest, support vector machine, stochastic gradient descent, Naïve Bayes and different deep learning methods, such as simple recurrent neural network (RNN), long short-term memory (LSTM), bidirectional long short-term memory (BiLSTM) and convolutional neural network (CNN) models, are widely used for sentiment analysis (Rodrigues et al., 2022).

To deal with this challenge, the techniques that are already in use for spam detection could be gathered under three groups (see Fig. 2.15). The first technique is syntax analysis, which focuses on analyzing tweets based on the content (character and word), and Naïve Bayes is the most successful algorithm for this technique with regard to time efficiency and accurate results. In addition to this, some studies work on analyzing shortened URLs embedded in tweets, which could be a shorter version of a

spammer's long vicious URL (Wu et al., 2017). Secondly, the feature analysis is used for spam detection on Twitter. The method of the feature analysis could make use of several account features, such as the number of followings, the number of followers or even the age of the account; diverse tweet features, such as the average number of hashtags in a tweet or the ratio of tweets containing URLs; and social graphs (Wu et al., 2017). These tracked features are used as training data in machine learning algorithms to detect malicious content on Twitter. The other prevalent technique for spam detection is blacklist methods, which are based on user feedback and website crawling to prevent baleful tweets; however, since this method depends on manual labeling and analyzing information, it takes a lot of time to detect spam (Wu et al., 2017).
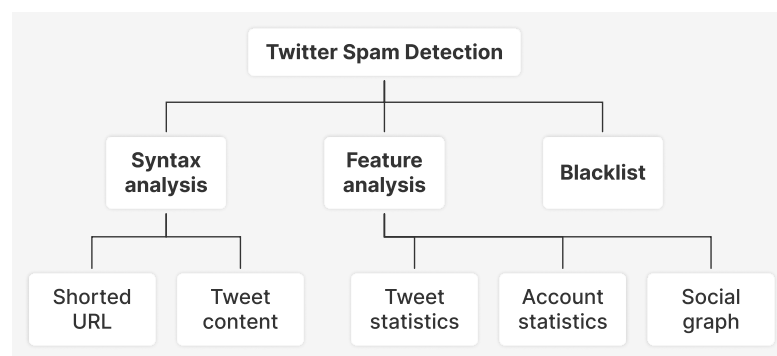
Figure 2.15 Categorization of Twitter spam detection techniques

2.2.3.1.3 Detecting and Removing Harmful Content

Similar to spam problems, social network sites lead to the creation and rapid dissemination of toxic content. For eliminating maleficent content, most of the SNSs have been reinforced with AI containing effective machine learning algorithms alongside professional moderators, reports submitted by users and human fact-checkers; for instance, images and other visual contents shared on SNSs are scanned through computer vision, while comments and textual part of the posts are checked via NLP to detect hateful and toxic speech, spam, fake news, and cyberbullying (Stefano, 2022) (see Fig. 2.16).

2.2.3.1.4 Social Media Chatbots and Virtual Assistants

Conversational agents have become indispensable members of people's daily lives, and their application areas reach out from mobile phones to smart home devices. As a reflection of this popularity on social network sites, Facebook AI announced that they have developed an open-source chatbot called *BlenderBot* in 2020; moreover, BlenderBot was designed to embody various conversation skills, such as establishing empathy towards users, having the ability to impersonate a persona and to debate almost any topic in order to express emotions in a more humane way (Roller et al.,
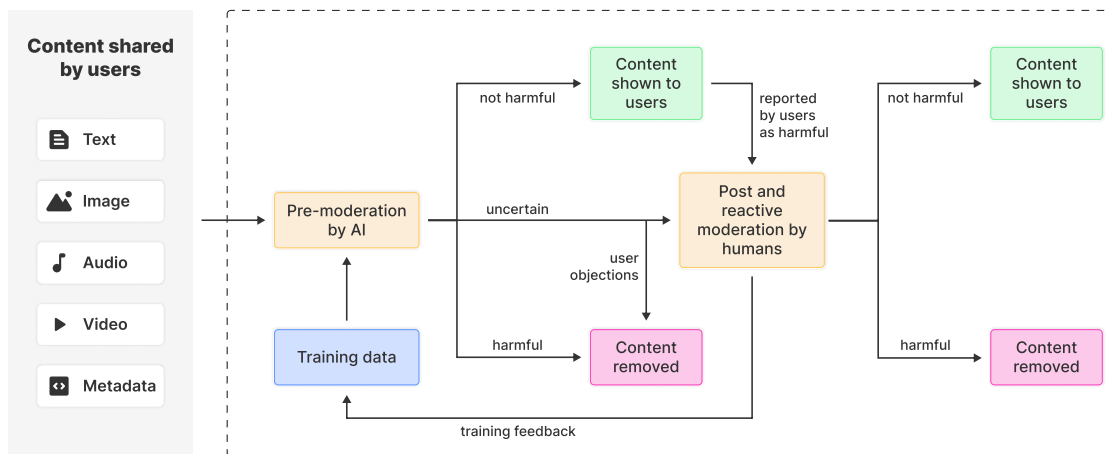
Figure 2.16 How AI can be used to recognize and remove toxic content

2020). According to a recent publication by Shuster et al., 2022, BlenderBot's conversational skills have been enhanced with the integration of long-term memory and checking of the Internet allowing users to exchange more meaningful information with users for higher quality conversations. Nevertheless, in spite of these advances, Facebook's chatbot continues to generate toxic and offensive responses.

2.2.3.2 External AI Tools on SNSs

Different from embedded AI applications on SNSs, the external AI tools are mostly complement tools supporting both individual users, especially social media influencers, and brands for the moderation of their social media strategies.

2.2.3.2.1 AI Tools for Content Creation and Management

The AI tools for content creation and management allow users to generate appropriate content and transmit those content to the target audience. For instance, *Lately* is a tool to create shareable content in a shorter time with the use of old data on the account to gain knowledge about what is meaningful for audiences of that account and what contents could be shared in advance (Lately, n.d.). In addition, since all social network sites have their own unique features and audiences, the content to be shared could also differ from one platform to another. For this reason, there are several tools that enable site-specific content development, such as *Persado*, which produce original and right messages with the consideration of the brand identity across sites, including Instagram and Facebook (Persado, 2022). Apart from creating genuine content, these AI tools could also help users to manage their accounts. *Emplifi* intends to decrease the loss of time in social media management for users by making influencer discovery and audience analysis (Emplifi, n.d.). Beyond these, AI tools, such as *Buffer*, could provide prioritizations among the conversations to which could be replied first with machine learning and sentiment analysis so that companies can manage their time

and resources to respond to the most significant conversations (Buffer, n.d.). Even further, with the ML integration, brands could get recommendations for answers to be used in online conversations; for example, *SproutSocial* generates creative responses for Twitter messages through text analysis (SproutSocial, n.d.).

2.2.3.2.2 Social Media Analytics

There are also a variety of tools that leverage artificial intelligence to gather insights from brands' shared content, profiles, and audience, and analyze insights to make assessments about user sentiment, such as cultural, political, and social trends. An example of these tools is *Linkfluence*, which enables brands and social media influencers to analyze their brand, better understand their audience across different SNSs, such as Facebook and Twitter, and forecast online trends among audiences (Linkfluence, n.d.). On the other hand, with the use of archival data, companies could decide what time is the best time for posting content or what to post. As an example, *Cortex* gives brands recommendations for what and how frequently to share content through the assessment of the account's historical metrics (Cortex, n.d.).

2.2.3.2.3 Social Media Advertising

Social network sites have become one of the most significant and fundamental mediums where companies could promote their products and advertising campaigns be conducted. Thus, AI-powered tools have been developed to allow monitoring of brands' marketing campaigns and even writing ad content. *Pattern89* and *WordStream* are the tools that improve companies' performance and prevent wasting their time and money via machine learning algorithms for Facebook and Instagram ads (Pattern89, 2021; WordStream, 2022). Besides, *Phrasee* is a tool for authoring shorter Facebook and Instagram ads by keeping track of old content data to identify which ads got more interactions and which ones were not effective to draw audience attention and require enhancement (Phrasee, 2022).

2.3 Ethics on SNSs

According to Cambridge University Press, n.d., ethics is defined as a set of beliefs about what is morally right and wrong. In a general manner, ethics could be considered as a classification or philosophy of moral values and principles that an individual or group uses to classify particular situations as right or wrong and to determine the right course of action (Barrett-Maitland & Lynch, 2020). Ethics search for giving answers to fundamental questions, such as "How should an individual be living?", or "How does a person achieve to be happy?", and if these ethical values are followed, it could lead to positive outcomes as well as concordant relationships. Hereby, since these ethical principles could be applied to various aspects of life, such

as personal relations, business practices, scientific research, and social policies, these inevasible values also have a prevalent and crucial reflection in the use context of social network sites.

As a matter of fact, in order to improve SNS experiences, AI and a wide variety of ML algorithms are employed, which brings tracking of user interactions and processing millions of data. However, apart from the intended and favorable outcomes of SNSs, this exceptional growth of SNSs also raises ethical concerns from both sides of users and SNSs managers, including questioning whether the shared data on SNSs is public, by whom could actually authorize to use the data and whether SNSs users consent to the sharing of their data. Hence, according to the research conducted by Shannon Vallor, 2012, the three interlinked types of ethical phenomena are addressed:

- *Direct ethical impacts* of social network activities themselves on the users, third parties, and institutions in terms of being right/unfair or beneficial/harmful;

- *Indirect ethical impacts* on society of social network activities, which stem from the combination of behaviors of users, SNS providers, and/or their agents in intricate interactions between these and other social actors;

- *Structural impacts* of SNSs on the moral form of society, particularly the ones that are influenced by the dominant surveillant and extractivist value trends maintaining the social network sites and culture.

2.3.1 Social Network Sites and Privacy

One of the critical ethical issues on social network sites is privacy, (Turculeţ, 2014) mentions that two main concerns of the privacy issue are the user's own moral principles during the use of SNSs and the control and management of shared information on SNSs. People are quite conservative and self-controlled regarding sharing information about themselves in real life. On the contrary, in the virtual world, people are willing to share about themselves because social network sites exist for users to actively engage with other users, and to do this, they try to keep their profile dynamic as possible by sharing pictures, videos, and other content. As a result of this, they consciously or unwittingly reveal their sensitive and non-sensitive information including spatial-temporal data (e.g.location and time-stamp) and personal information (e.g. personal background, interests, contacts and etc.), which results in serious social and economic threats, such as sexual abuse, stalking, identity theft, and online victimization (Aghasian et al., 2017). Besides, since the information is tracked and recorded within the system, the user data becomes open to be distributed anytime and by anyone. Therefore, the user's privacy is dependent on the information management on SNS as well. Nevertheless, as privacy is a vague concept, and defining it is not an easy task, even further the term privacy is used interchangeably with personal privacy and information privacy. There are diverse definitions of privacy provided by different researchers. (Palen & Dourish, 2003) reckoned three basic privacy boundaries that are key qualifications of privacy management:

- *The disclosure boundary*, which is related to the tension between private and public, and the focus is on the identification of what information could be unveiled under what situations even,

- *The identity boundary*, which is the association between self-representation and others (audiences), and it refers to the display and maintenance of identities of all parties that are involved in the information trade,

- *The temporal boundary*, which denotes the bounds of time i.e., the conflict between past, present and future actions based on disclosed information.

In respect of these boundaries, the breadth of the audience, the depth of usage allowed and the duration specify the context, where the information is entailed as privacy, and when these aspects are exceeded, privacy violation is aroused (Beye et al., 2012). Besides, according to the work of the definition of privacy by Solove, 2006, privacy cannot be dissociated from society, and the term privacy is an umbrella term that refers to a diverse group of interconnected things. Nonetheless, the generic use of this term raises the convergence of disparate privacy problems; thus he proposed a taxonomy, which is made of four groups of harmful activities: information collection, information processing, information dissemination, and invasion, to differentiate a wide range of privacy problems. In line with these dimensions, this highly vague concept of privacy on social network sites could be encountered as the following primary issues regarding the direct ethical implications of social networking activities: the distribution of users' data to third parties, particularly for the purposes of marketing, surveillance and data mining; unrevealed transferring of user data and activity patterns to government entities; the use of data for training facial recognition systems or other methods of machine learning algorithms without user's consent; the collection and publication of user data by third-party applications without user awareness; the exploitation of SNS and collected data for stalking and harassment; the extensive scraping of user data for unpermitted intentions by researchers; insufficient and non-transparent privacy settings of SNSs; the use of cookies to keep track user activities even though they already have left the social platform; and, the encouragement of user actions that contain ill-informed or irrational information concerning either users' own data or other people's or entities' data by SNSs (Vallor, 2012).

On the other hand, indirectly, SNSs subvert society's privacy norms, as these platforms give the user freedom to decide what they can and cannot share, which causes a weakening in their own and others' privacy, as opposed to society's conventional understanding of privacy (Vallor, 2012). For instance, third-party companies, such as advertisers and insurance companies, have become disinterested in analyzing data and making assessments about individuals' lives; contrarily, their main intention is to train their algorithms by utilizing shared data so that they can make predictions about potential audiences which have a similar pattern with tracked individuals. Hence, the

main issue of privacy turns from an individual's problem to a society's problem, since although the user is aware and comfortable with their personal risk while sharing content via SNSs, this does not mean that these actions are ethical for others as well.

From the side of the structural impacts of SNSs on the ethical form of society, privacy depends on the context, which is not only the tension between privacy and publicity but also related to the properties of the social environment that are constituted by peculiar norms, values, and roles; thereby, Helen Nissenbaum's notion of contextual integrity which entails behavioral changes during the exchange of information with the consideration of context-sensitive norms is a suitable indicator to prove the variety and intricacy of privacy ethic (Vallor, 2012). In real life, people alter their behaviors according to the context; for example, while it is natural for an individual to talk about their economic situation to their family and close circle, it is not expected to share the same information with a random person. The same is valid in the social media environment, which does not indicate that the career history that individuals share on LinkedIn could be disclosed to strangers and made public for some reason. Even further, Nissenbaum, 2004 propounds two fundamental types of information norms: norms of appropriateness, which engage in the types of information about people that is expected, permissible, and required to be disclosed in a certain context; and norms of flow or distribution, which include the transmission of information from one party to other ones. In the case of the sustainment of these sets of norms, contextual integrity is preserved; otherwise, it collapses when either one of the norms is violated. Besides, even though users are notably willing to protect their privacy, the tendency of users to change their actions and opinions regarding privacy in the contexts of SNS is high, which could be seen in their acceptance and compliance with recently announced privacy practices provided on SNSs (Hull et al., 2011). This indeed points to a related concern called privacy paradox (Vallor, 2012), which is related to the inconsistency of the values users have previously claimed regarding privacy.

In brief, considering all these dimensions above, the uncertainty of where privacy begins and ends for an individual, and the definitions of privacy that includes disparate but closely associated characteristics, upholding privacy on social network sites is one of the main concerns that require special effort. Here below, two case studies are analyzed to demonstrate how privacy could be easily violated by separate actors of Facebook, such as Facebook itself and third-party companies.

2.3.1.1   Facebook News Feeds and Privacy

The study carried out by d. boyd, 2008b presents the reflections and discomforts of Facebook users and reveals how the information privacy norms in society have been influenced by the technology from the lens of the new feature called News Feeds, which Facebook introduced in 2006, from two basic perspectives: exposure and invasion. The News Feeds feature enables users to track their friends' every single online action on Facebook from relationship status to the groups that they have

joined or left. Although users were aware that all this information had been collected and recorded by Facebook from the beginning, this information was not so easily reachable and viewable on users' pages. As a result, within a short time, thousands of users created several Facebook groups to remonstrate against the News Feeds feature and to show their outrage (Schmidt, 2006). Subsequent to these protests, Mark Zuckerberg, who is the founder of Facebook, published an entry named *"Calm down. Breathe. We Hear You."* to placate users; however, this was not an adequate solution to calm down people, so he again posted another entry as a new form of privacy options with an apology, and additionally, he organized a live meeting on Facebook to explain News Feeds feature to users. During the meeting, he advocated that all the information is already public, and they do not disclose user information but with the feature, they allow users to connect better with their friends. On the other hand, d. boyd, 2008b asserts that despite all the visible information, Zuckerberg's argument is not far too perceiving how the social dynamic could be changed by this feature; since with the aggregation of user information and making it visible to users' News Feeds, Facebook forced users to re-evaluate their privacy expectations that interactions would be undiscovered to the expectations that each interaction would possibly be revealed. As a result of this feature, a variety of exposure concerns burst and Facebook users felt exposed and disgusted. In addition, this feature also made users feel invaded because the virtual world theoretically offers countless network possibilities to users, but not all of the established relationships are as real and close as in the real world (d. boyd, 2008b).

Case study describing privacy issues aroused due to Facebook's News Feed feature in 2006 (boyd, 2008b)

Context	Facebook launched a new News Feed feature in 2006, and users were shocked and outraged when they noticed that their all online actions were disclosed and got public on their feeds. The users protest against this feature and Zuckerberg tried to convince them by explaining the motivations of developing News Feed.
Objective	To describe privacy issues that are aroused due to Facebook's News Feed feature
The case	Focusing on privacy issues on Facebook
Key findings	Users felt exposed and invaded:

1. All information has become accessible and visible to everyone.
2. Users reconsidered as their privacy expectations that every actions would be exposed to others.
3. Traditional social dynamics alter more easily.

Figure 2.17 Case study describing privacy issues aroused due to Facebook's News Feed feature

For this reason, users felt uncomfortable as the News Feed feature disclosed all the user interactions occurring on Facebook to their 'Friends' who are not very strong ties. Over the years, Facebook has evolved its feature; even though many privacy concerns have been allayed, and users, especially the younger generations, are more open to adjusting their privacy norms, privacy still has to be held to be sustained by the rights of control and management of user information (d. boyd, 2008b) (see Fig. 2.17).

2.3.1.2 Facebook, Cambridge Analytica and Privacy

Another case study about privacy violations on SNS elicits the distribution of user information to third parties without user consent (see Fig. 2.18). In 2015, the Guardian revealed that Ted Cruz's US presidential campaign exploits millions of unconsented users' data through a data firm named Cambridge Analytica to have an advantage against his competitors; although Facebook was investigated by the Federal Trade Commission for violating US privacy laws after it was discovered that Facebook was spreading personally identifiable information (PII), this scandal highlights the inadequacy of privacy laws, agreements and users' vulnerability on social network sites (Davies, 2015; Isaak & Hanna, 2018). The analysis led by researchers from the University of Cambridge in 2013 proved that "OCEAN" psychological profiles (openness, conscientiousness, extraversion, agreeableness, and neuroticism) could be associated with a user's interactions on Facebook, such as likes and shares (Concordia, 2016). Based on this study, Cambridge Analytica integrated a great variety of data, more than 87 million users' data without their permission, to estimate the propensity to vote for Ted Cruz (Isaak & Hanna, 2018). Even more, since Cambridge Analytica could aggregate Facebook users' friends' data through Open API, individuals who do not have Facebook accounts are not guaranteed to be protected from privacy breaches, and the data could be monitored through the information from websites harboring the Facebook logo and the web beacons. As a consequence of this case, the study by (Isaak & Hanna, 2018) indicates that there must be several principles for user privacy and data protection:

- *Disclosure of users:* every social network site must enable users the whole disclosure of information that is held about users by the SNS, as well as by any other third parties that may have access to that information directly or indirectly.

- *Public transparency:* is the unveiling of which types of data have been collected by SNS, what data is kept, how the data is used, and what is shared with third parties in a direct or indirect way. The complete explanation of all data collection mechanisms is also part of transparency, as well as web beacons and other data tracking mechanisms, and the disclosure of all ongoing content on a user's device by considering the use of that content.

- *Control:* is about the management of user privacy, including being able to delete PII from any site, device, or cloud service; being able to recognize and remove any content shared on SNS; allowing users' 'do not track' requests and users to confine revelation by third party cookies during sessions; underage persons must be protected by a legitimately established age of consent to publish their private information; and even though users might enable an SNS to collect their data, this permission must not involve information about their networks or friends.

- *Notifications:* is connected to users' directly or indirectly being informed in case of the misuse or loss of their private information by any parties that gather and record that information and users' right to learn the source of privacy breaches and responsible parties disrupting their privacy. In addition, users also must be notified about paid advertising and content with explicit information by explaining that this is paid content and what is expected customer action with the link to the material source.

Case study presenting the distribution of unwitting user information by Facebook and Cambridge Analytica (Isaak & Hanna, 2018)

Context	In 2015, the Guardian revealed that Ted Cruz's presidential campaign exploits millions of unconsented Facebook users data through a data firm named Cambridge Analytica to have an advantage against his competitors.
Objective	To examine how Facebook handed over user data to a third party, Cambridge Analytica and to display main principles for protecting user privacy
The case	Focusing on privacy issues on Facebook
Key findings	Not only Facebook user's data but also users' friends data could be collected by Open API Individuals not having Facebook account are not guaranteed to be protected from privacy breaches. The user data could be also monitored through the information from websites with the Facebook logo and the web beacons. Privacy and data protection should be retained by four principles: 1. Disclosure of users 2. Public transparency 3. Control 4. Notifications

Figure 2.18 Case study presenting the distribution of unwitting user information by Facebook and Cambridge Analytica

2.3.2 Social Network Sites and Transparency

Albeit Cambridge University Press, n.d. defines transparency as objects' or concepts' characteristic of being easy to see through, similar to the concept of privacy, transparency is also not composed of just one dimension and it could be associated with openness, explainability, accessibility, interpretability, and visibility (Felzmann et al., 2019). Another definition of transparency, according to the General Data

Protection Regulation, n.d., is that it "requires that any information or communication relating to the processing of personal data is easily accessible and easy to understand, and that clear and plain language be used". Therefore, by considering the aspects above, transparency is more than open information transfer, and Albert Meijer (2014 as cited in Felzmann et al., 2020) declares three core components that uphold the principle of transparency: virtue, relation, and system. Transparency as a virtue is a fundamental feature of actors, systems, and institutions with the embodiment of openness about their actions, behaviors, or processes; on the other hand, transparency goes beyond individuals, and it considers the relation between actors and receivers (Felzmann et al., 2020). Lastly, within the perspective of the systemic dimension, transparency refers to the organizational context of the transparency relations, and it requires the organizational context to be perceived and recognized with the internalization of the peculiar contextual elements, such as relevant lawful, regulatory, and institutional precautions (Felzmann et al., 2020). In the next section, transparency issues on SNS are addressed by two example cases from TikTok and Facebook.

2.3.2.1 TikTok and Transparency

TikTok employs a similar machine learning system, such as Facebook, to recommend users more meaningful videos and personalize users' feeds. When a user opens TikTok, its algorithm shows eight popular but dissimilar contents (Newton, 2020). Afterward, the algorithm collects data to trace the user's preferences and to classify contents into groups with similar themes based on several dimensions that consist of video information (captions, hashtags, and sounds), user information (videos that are liked or shared, followed accounts, comments posted), and device and account settings (country setting, device type, and language preference) (Newton, 2020; TikTok, 2020).

TikTok continues to be downloaded by users since its release in 2016 and reaches millions of users daily without losing its popularity. Based on this rapid rise, many claims are made that TikTok does not have adequate and fair measures for data protection. Even more, one of these claims was asserted by the European Consumer Organization with several accusations which include that TikTok does not have enough fairness regarding its terms and conditions for the content creators, that the site does not fulfill the protection of underage users' data from baleful and toxic content, and that TikTok's data aggregation methods might infringe the GDPR terms (Ikeda, 2021). Besides, TikTok encounters these kinds of allegations due to the current geopolitics, and economic competitions around the world, such as the tension between the US and China. The TikTok ban has become a current issue in the US due to Donald Trump's allegation of TikTok's automatic seizure of massive amounts of

user data (Carvajal & Kelly, 2020); over and above this, this debate has induced other countries' governments, such as Australia, Pakistan, Indonesia, and Japan to discuss the use of TikTok, and eventually, in India, TikTok has been banned since mid-2020 (Iyengar, 2020).

Notwithstanding all these claims, in comparison to other social network sites, such as Facebook, TikTok does not appear to gather any more useful or valuable data from users. In addition, TikTok puts efforts to demonstrate the value it places on corporate transparency through various initiatives, such as publishing regular bi-yearly reports since December 2019 similar to Facebook. According to Justin Grandinetti, 2021, focusing on all these biased and majorly policy-based claims overshadows the real problematic parts of TikTok, and he adds that both the transparency initiatives and the reports released by TikTok authorities are still not fully explicit about disclosing TikTok's main functionality and user data; in fact, they seem to be part of strategies carried out mostly for advertising purposes. For example, TikTok's representatives declare that they are concerned about one of the common challenges on recommendation engines 'filter bubbles' which is considered an algorithmic bias limiting to view contents sharing opposite perspectives and that does not deliver users' feed pages with full of heterogeneous contents (TikTok, 2020), and for this reason, they state that the algorithms of TikTok are redeveloped on a regular basis to resolve this issue (Newton, 2020). At the end of the day, such initiatives bring TikTok positive points in terms of ethics of transparency compared to other platforms, on the other hand, TikTok does not fully unveil the necessary human intervention for content moderation (Grandinetti, 2021). Often the most harmful content is revealed by low-paid workers analyzing and labeling the content one by one, called micro workers, not by the magic of artificial intelligence (Tubaro et al., 2020) (see Fig. 2.19).

Another hidden issue is how TikTok's methods for content moderation eliminate content created by 'undesirable users'. According to leaked documents in 2019 from TikTok, its content moderators were ordered to block the videos created by users who are considered 'having an unattractive body shape, too ugly, too thin, poor or disabled people for TikTok; beyond this, that the moderators also were told to suppress the political speech in the live streams, to ban from the TikTok the one broadcasting live feeds about government bodies, such as police, to impose penalties the ones who damages 'national honor' (Biddle et al., 2020) (see Fig. 2.20). Furthermore, another document professes that TikTok reduces the visibility of poorer TikTok users on the platform by checking whether the uploaded videos feature badly maintained environments that contain 'rundown', 'ratty' or 'rural areas' and removing them (Biddle et al., 2020). These incidents on TikTok are not the first. TikTok has previously been charged with that the moderators also deliberately suppressed content from fat, black, or LGBTQ+ creators; thereafter, TikTok has admitted this accusation and a representative from TikTok defended this by stating that these special user groups are

Case study analyzing TikTok and transparency (Grandinetti, 2021)

Context	Several accusations are made (by both governments and organizations, such as European Consumer Organization) that TikTok does not have fair and transparent measures for protecting user data and collecting data. Indeed, some countries are banned TikTok.
Objective	To analyze how TikTok handles transparency concern and what is the reality behind these accusations
The case	Analyzing transparency issue on TikTok
Key findings	TikTok's discursive and material aspects are contradictory in many respects; 1. TikTok has regularly published biyearly transparency reports since December 2019. 2. TikTok's recommendation engine creates 'filter bubbles' which results in showing users' feeds with homogenous contents. 3. TikTok is opaque about the fact that content moderation actually requires quite human labor to detect and label harmful, toxic content. 4. Within content moderation policy, moderators are obligated to remove content from 'undesired creators' who have an unattractive body shape, too ugly, too thin, poor or disabled people. 5. Besides, TikTok admitted that it deliberately suppressed content from fat, black or LGBTQ+ creators in the past. 6. TikTok also suppresses the political speech in the live streams, bans from the TikTok the one broadcasting live feeds about government bodies, such as police, and imposes penalties the ones who damages 'national honor'.

Figure 2.19 Case study analyzing TikTok and transparency (Grandinetti, 2021)

more vulnerable to harassment or cyberbullying because of their physical and mental condition (Burke, 2019). The content created by these susceptible groups of users was flagged to ensure them not to be seen except for their origin country and restrict them from presenting on TikTok's 'for you' section (Burke, 2019).

New rules	Reason
Abnormal body shape, chubby, have obvious beer belly, obese, or too thin (not limited to: dwarf, acromegaly)	Unlike diversified videos of which the content itself is the mainly focus, in the non-diversified content, the character himself/herself is basically the only focus of the video, therefore, if the character's appearance or the shooting environment is not good, the video will be much less attractive, not worthing to be recommended to new users.
Ugly facial looks (not limited to: disformatted face, fangs, lack of front teeth, senior people with too many wrinkles, obvious facial scars) or facial deformities (not limited to: eye disorders, crooked mouth disease and other disabilities)	
The shooting environment is shabby and dilapidated, such as, not limited to: slums, rural fields (rural beautiful natural scenery could be exempted), dilapidated housing, construction sites, etc. (For internal housing background which has no obvious slummy charactor, only those cases as specified should be labelled: crack on the wall, old and disreputable decorations, extremely dirty and messy)	This kind of environment is not that suitable for new users for being less fancy and appealing.
Slide show video with any kinds of picture	Not the ideal video form of our plataform.

Figure 2.20 TikTok's ugly content policy. From *TikTok told moderators: Suppress posts by the "ugly" and poor to attract new users* by Biddle et al., 2020.

Considering all this, TikTok's published reports and discursive movements including other transparency strategies seem to be at the intended level for transparency, but in fact, TikTok's discursive and material aspects are contradictory in many respects, including the hidden coordination of the human and machine duo that makes the platform operate and not unveiling practices targeting some user groups implemented in content monitoring.

2.3.2.2   Facebook and Transparency

With the ongoing popularity of social network sites, executives and policymakers devote more attention to investigating and developing transparency regulations (Andreou et al., 2018). Thus, Facebook introduced several transparency initiatives in response to this growing concern. Since 2013, Facebook has revealed biannual transparency reports, which explicate the security of user privacy and access to user data; moreover, the reports also cover the government requests for data, content restrictions depending on laws, the number of worldwide internet outages by governments, and intellectual property contraventions (Sonderby, 2020). Besides, Facebook provided ad transparency through two separate mechanisms, since the ambiguity in Facebook's ad transparency policy is that users do not perceive what data advertising sites know about them and how the system of ad targeting works with their data (Andreou et al., 2018). Even, this could be caused by revealing misinformation as well. The first mechanism is the option of 'Why am I seeing this ad?' which allows a user to understand why they have been targeted with a certain ad with the details of targeting, such as the user's demographic information, interests, and categories that correspond with a particular ad (Thulasi, 2019). It also tells users where the information has been reached, such as the website that they may have visited in the past or the pages that they may have liked (Thulasi, 2019). The latter is that Facebook launched the *Ad Preferences* page where users could control the ads that they may see, become aware of how ads work, and restrict ads from certain businesses and topics (Satterfield, 2020). Moreover, on the *Ad Preferences page*, users could see information about businesses that upload records with user information, such as email addresses and contact numbers (Thulasi, 2019).

However, this would not be right to be deceived by such transparency mechanisms of Facebook since its notoriety is not limited to the disclosure of user data, misuse of data, and the spread of disinformation. This bad reputation also extends to the opacity of targeted advertising mechanisms and how Facebook actually does not block white supremacist content and even promotes such pages. Ali et al., 2019 argue that contrary to Facebook's claim that it takes into account neutral targeting parameters, Facebook's advertisement algorithms serve ads based on parameters that include gender, race, and social stereotypes. For example, advertisements for cashier positions in supermarkets are presented to an 85% female audience, while job

opportunities in the lumber industry reach an audience of 72% white and 90% male (Ali et al., 2019). For the ads targeting, Facebook takes advantage of the data in which users have entered their basic information (gender identities, preferred pronouns, relationship status, interests, music tastes, favorite movies, and books) and contacts while signing up (Grandinetti, 2021). On the other hand, Facebook creates a platform for hate groups to spread their extremist words and opinions and find new members. According to an analysis of Tech Transparency Project, 2020, hundreds of white supremacist groups exist on Facebook despite the fact that Facebook community standards forbid hate groups that lead to any form of exclusion, bullying, or violence based on race, class, ethnicity, or other factors, as well as hate speech.   The investigation found that 221 white supremacist organizations were linked to a total of 153 Facebook pages, some of which have been in active use for a long time, and 4 Facebook groups (Tech Transparency Project, 2020). What's more, the researchers found that Facebook itself has generated most of these identified white supremacist pages. When users enter job information that does not have any page on Facebook in their profile page, Facebook automatically creates a business page for that job (Tech Transparency Project, 2020). Another research puts forth that Facebook AI is not that intelligent to detect deliberate misspellings; that is, extremist users could cause Facebook AI to fail by removing the spaces between words and shifting letters on the word with numbers, symbols, or even emojis (Meaker, 2019).   Along with these strategies, they use threatful acronyms, such as 'GTKRWN' ('gas the kikes, race war now') and hashtags, such as *#thegreateststorynevertold* (as the code for 'Hitler was right') to avoid the detection of hate speech, and even they invent new words, such as 'ZOG', 'ZIO' to use instead of 'Jews' (Meaker, 2019).   As a further aspect of such incidents, on the *Related Pages* section of Facebook, other extremist or far-right pages and groups are presented to users who have previously visited white supremacist pages; thereby, Facebook sets the ground for the creation of echo chambers to consolidate and legitimate the arguments of white supremacists (Tech Transparency Project, 2020).

Apart from all these, Grandinetti, 2021 highlights that Facebook's use of AI is not entirely transparent, unlike both declarations by Facebook's authorities and official announcements as corporate, and he asserts that by explaining its investments in AI including initiatives about user information, data policies, and information moderation, Facebook keeps both users and researchers busy, which leads to the vagueness of the use of AI and ML algorithms. Similar to TikTok, Facebook's content moderation still functions to a significant extent through human ghost labor, contrary to the AI picture that people envision as super intelligent (Grandinetti, 2021; Wakefield, 2021).   With another perspective on the same issue, these content moderators struggle with serious stress and mental problems due to the constant exposure to so much frightening content, such as hate speeches murders, suicides, violent attacks, sexual content, and graphic pornography including child pornography;

albeit they get trained to learn how to deal with it (Newton, 2019). As a result, Facebook not only hides ghost labor but also sweeps the extremely difficult situation that content moderators face under the carpet.

Another transparency issue that Facebook has not given very good performance is censorship which is also a pretty noteworthy problem in other social network sites. As Facebook's ultimate goal is to conserve its position and power in social media, Facebook maintains good relations with governments by censoring numerous political content, and in some cases, it even encourages the glorification of crime. A recent Facebook leak divulged that Facebook devised a list of 'recognized crimes' in which crimes causing only physical, financial, or mental harm to individuals are recognized (Hern, 2021). Based on this list, crimes, such as theft, robbery, fraud, murder, vandalism, and non-consensual sexual touching are taken into account in the community policy, whereas crimes, such as "allegations about sexuality", "peaceful protests and marches against governments" and "controversial debates about historical events and subjects, such as religion" are excluded from the Facebook policy, and when a content that contains crimes not recognized by Facebook is shared, the content moderators are obligated to expurgate it (Hern, 2021). As a result, by making this list, Facebook aimed not to protect users in countries where the rule of law principle is weak and not to conflict with the governments so that it can stay in function in those countries.

In conclusion, although Facebook claims that it transparently presents to people what and how they use AI and what data is collected from users, and takes some steps in this direction, such as transparency reports, and the features of *Why I am seeing this ad?*, *Ad Preferences* page, it does not actually still share much information about how it is functioning and even deceives individuals with misinformation about its AI and algorithms (see Fig. 2.21). That is to say, the place where Facebook positions AI with its discursive actions that it claims to use AI for advertising and content moderation does not quite match the facts (Grandinetti, 2021). Contrary to popular belief, Facebook's AI is not a sufficiently advanced and superior system, and it could help to spread misinformation and increase extremist groups and content on the platform. In addition, it has been revealed how different the actual functioning of its content moderation is from the one explained thanks to the leaked documents.

2.3.3 Social Network Sites and Race, Class and Gender

Remembering that social network sites are a kind of extension of real life, it cannot be ignored that they consist of many discriminatory, racist, extreme ideas and discourses targeting a certain group of society on these platforms. That is why, a further ethical issue, which is an important challenge on SNSs and actually intricate with other ethical concerns, such as transparency, privacy, and fairness, is hatefulness against race, class, and gender which are some of the factors that define an individual's identity. As a matter of fact, it is not only that people share their extremist ideas on these sites or

Figure 2.21 Case study analyzing Facebook and transparency (Grandinetti, 2021)

find new members for their alliance, but also the algorithms of these SNSs reinforce this discriminatory attitude and even create new challenges by tracking and processing user data differently and/or not taking into account the identity diversity of people. In a similar manner, Back (2002 as cited in Siapera and Viejo-Otero, 2021) claimed that with newly-emerging technologies, existing biases, and injustices are revived and reshaped in such a way that could permeate the whole world instead of weakening the prejudices. In addition, studies by Ekman, 2018 and Froio and Ganesh, 2019 indicated that SNSs reinforce organized racism and extremism, and even give space to these discriminatory groups for generating new words and terms and power to spread their statements. The prevalence of hate speech on SNSs, such as misogyny, anti-Semitism, and Islamophobia reveals that racism is related to both extremist groups and users and is shaped by the characteristics of the platform (Siapera & Viejo-Otero, 2021). Putting it differently, minority groups, which were previously the target of hate speech, continue to be targeted via social network sites with new methods.

Consequently, preventing discrimination and inequality against a group on social network sites based on a certain race, gender or class entails the creation and thorough implementation of many regulations. SNSs, in this respect, need to determine which content could be considered harmful and discriminatory or which

content must be removed from the platform; in brief, social network sites are obligated to determine, control and implement rules and policies around the concept of hate speech in order to preclude supremacist groups from spreading their toxic and baleful ideas since these platforms are just mediators between different users from different levels of users, such as individuals, businesses, organizations (Siapera & Viejo-Otero, 2021). The following section illustrates how social network sites yield hateful discriminatory content towards minority groups of society.

2.3.3.1 Facebook and Race, Class and Gender

In order to respond to the ethical concerns in social media, Facebook has primarily devised the Facebook Principles, Terms of Service and Community Standards which outline Facebook's overall identity, where it contains which parameters are taken into account while addressing hate speech issues. According to the recent Facebook Community Standards (Meta, 2023), Facebook declares that they designate hate speech as "violent or dehumanizing speech, harmful stereotypes, statements of inferiority, expressions of contempt, disgust or dismissal, cursing and calls for exclusion or segregation", alongside delineating hate speech as the attacks towards the characteristics of individuals: race, ethnicity, national origin, religion, class, gender identity, sex, sexual orientation, disability, and serious disease. Secondly, Facebook has also developed several methods and techniques that enable users to perceive how Facebook policies are executed. For instance, through the reporting mechanisms, Facebook could monitor each post, profile, or even comment on a post by users' self-reporting. When a user wants to report a comment, they need to follow a couple of actions shown in Fig. 2.22, and it starts with clicking on three dots and then they can see the report option and flag the content. After a while, if Facebook decides that the content violates community standards, the comment is removed. Though this mechanism could be considered a step taken against hate speech on Facebook, this process is slow and depends on users' own judgment.

Another method is AI systems for the detection and removal of hate speech, which is previously explained in the transparency issue. Simply, Facebook utilizes AI-powered tools to control content with the help of huge amounts of human labor. Content moderators analyze content to decide whether they are inappropriate or not based on the community standards, and remove them if there is any violation. Following that, AI tools rate content that is flagged by users depending on the similarity to content previously removed by content moderators. By enforcing these mechanisms, Facebook aims to embrace a neutral approach that does not take a decisive and clear position against racism; that is, it bears a race and color-blind manner, in which Facebook's system equally evaluates races similar to other kinds of debatable content, such as nudity and spamming since Facebook considers users as individualized and separate assets (Siapera & Viejo-Otero, 2021).
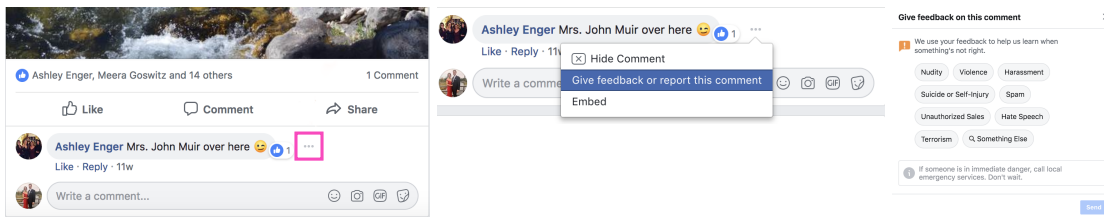
Figure 2.22 Reporting a comment on Facebook

Yet still, despite all this anti-discrimination approach, Facebook policies and regulations lack in preventing minority groups from being discriminated against, and in some ways, it even perpetuates and reinforces race and gender segregation in society. To be more precise, Facebook's hate speech algorithm is not so inclusive and fair toward all its users, and it is more prone to flag and remove the content from minority groups, such as Black people, LGBTQ+, Jews, or Muslims, contrary to what Facebook reports are explained. A report conducted by Facebook revealed that the number of Black people using Facebook has decreased by 2.7% in a month, which is now the new number of 17.3 million individuals (Dwoskin et al., 2021). Hence, unable to withstand people's objections and protests any longer, Facebook decided to change this 'race-blind' algorithm in 2020; that is, the renewed algorithm gives priority to labeling content that is considered as 'the worst of the worst' (Jibilian, 2020). As a side note, Facebook executives declared that based on their research, hate speech is mostly directed at minority groups that are underrepresented on social media; therefore, they believed that prioritizing content from minority groups along with de-prioritizing some content from White people, Americans, and men could be effective against spreading hateful messages and opinions (Mihalcik, 2020). For example, according to Facebook executives, it is more tolerable that the renewed algorithm could flag the statement "Men are trash" rather than "Women are trash" or "Black people are trash" (Owen, 2020). Substantially, this shows that Facebook algorithms fall behind with historical content and critical reasoning; as a result, they are not capable of equally approaching content whose topics are related to race, gender, and geopolitics (Grandinetti, 2021) (see Fig. 2.23).

2.4   User Experience and Interaction Design in SNSs

UX and IxD are critical considerations for social network sites as they strive to provide engaging platforms that foster meaningful connections and interactions among users. Even though the definition of UX has been constantly evolving, the term is invented by Don Norman in the early 1990s and it involves not only the product or service itself but also the broader context in which the end-users interact with the company and its offerings, such as marketing, industrial, and interface design (Norman & Nielsen, 2006). The concept of user experience in the context of SNSs goes beyond mere usability and functionality, and it encompasses overall satisfaction, emotional connection, and perceived value users derive from interacting on these platforms.

Case study analyzing Facebook and race, class and gender	
Context	Facebook Principles, Terms of Service and Community Standards structuring Facebook's overall identity, in which it contains which parameters are taken into account while addressing hate speech issues have been designed at first.
Objective	To present how factors defining a person's identity, such as gender and race, are tried to be protected through regulations and protection mechanisms and yet what is lacking and insufficient on Facebook
The case	Analyzing race, class and gender on Facebook
Key findings	1. Facebook's reporting mechanisms operate thanks to users' reporting each post, profile, or even comment on a post. 2. Facebook content moderators analyze content to decide whether they are inappropriate or not based on the community standards, and remove them if there is any violation. After that, AI tools rate content that are flagged by users depending on the similarity to content previously removed by content moderators. Despite all this anti-discrimination approach, Facebook policies and regulations lack in preventing minority groups from being discriminated against, and in some ways it even provides the perpetuation and reinforcement in race and gender segregations on society. 1. Facebook's hate speech algorithm is more prone to flag and remove the content from minority groups, such as Black people, LGBTQ+, Jews or Muslims. 2. Renewal of Facebook algorithm called as 'the worst of the worst': prioritizing content from minority groups along with de-prioritizing some content White people, Americans and men could be effective against spreading hateful messages and opinions.

Figure 2.23 Case study analyzing Facebook and race, class and gender

SNSs aim to create environments that are not only user-friendly and intuitive but also socially engaging, providing users with a sense of belonging, connection, and personal expression. Understanding user motivations, social dynamics, and cultural factors are crucial in designing SNSs that foster positive user experiences. In addition, IxD, closely intertwined with UX, specifically focuses on the design of the interactions between products and users that facilitate users in achieving their objectives in the most effective and efficient manner (Siang, 2023). In this light, IxD within the realm of SNSs involves the creation of interfaces and features that facilitate seamless and enjoyable user interactions, including designing intuitive navigation, content-sharing mechanisms, communication tools, and privacy settings. Interaction designers for SNSs need to consider unique challenges and opportunities of these platforms, such as managing complex social networks, handling user-generated content, and mitigating privacy concerns. The goal is to create interfaces that empower users to navigate and interact with the platform in a manner that aligns with users' needs and preferences.

Besides, research by Verduyn et al., 2017 highlights how the way of people interact with SNSs influences users' subjective well-being, which is defined as an individual's personal evaluation and perception of their own happiness and satisfaction, and it encompasses two dimensions: affective and cognitive (Diener, 1984). The affective dimension includes an individual's emotional experiences, such as experiencing positive emotions (e.g., joy, contentment) and minimizing negative emotions (e.g.,

sadness, stress), whereas the cognitive dimension involves an individual's cognitive appraisal of their life satisfaction. Remembering the previous section on the impacts of using SNSs, active engagement on SNSs with other people can contribute positively to well-being by facilitating social connections and increasing social capital; on the contrary, using SNS could also bring adverse effects on subjective well-being when individuals passively consume content on these platforms, they may, therefore, be more susceptible to experiencing negative emotions such as social comparisons and lower self-esteem, which can lead to distress and diminish subjective well-being of the user (Verduyn et al., 2017). Hence, it is important to provide and encourage individuals to be mindful of their SNS usage and endeavor to increase their active interactions and build meaningful interactions to optimize their well-being. To achieve this, all the actors responsible for creating these platforms, especially the UX and IxD designers cater to look to enhance users' SNS interactions and overall user experience.

While many policies and guidelines exist to determine how to design and control social media use, they often lack a specific focus on SNSs. For example, the Federal Trade Commission provides advice to the public about how they can protect their privacy during their use (Hebert et al., 2021), or at the organizational level, a lot of companies and institutes offer guidelines to their employees on how they can interact with the platforms without harming company interests, which such sets of recommendations and guidelines will be examined in-depth in the section of benchmarking research. Additionally, parents set some rules for the sake of ensuring the welfare of their children on SNS usage, such as limiting their usage time or supervising the SNS accounts of their children (Anderson, 2016). Nevertheless, merely leaning on the knowledge of parents and children is not a fully reasonable approach to address the risks of SNSs since they may lack entire comprehension of how to effectively manage these risks and might not have resources that are adequate to solve them (Livingstone & Brake, 2010). Therefore, it is urgent for UX and IxD designers involved in SNS development to incorporate design dimensions, such as the platform's interface, that promote safer digital environments, rather than relying just on users' knowledge and skills. Moreover, although the social media policies aim to prevent the potential risks and negative returns of using SNS and to create a healthy environment for the user population, the well-being of the user can also be directly affected by the SNS design itself. To put it better, poorly designed privacy interfaces or unclear interface controls, for example, can lead to misinterpretation and unintentional sharing of private information, adversely affecting the user's well-being (Livingstone & Brake, 2010). Hereby, to bridge the gap, Verduyn et al., 2017 propound that SNS providers work in cooperation with researchers to recognize aspects of their SNSs that improve users' subjective well-being. Furthermore, SNS providers should be encouraged to involve research insights into the development process of their platforms, aiming to enhance subjective well-being through thoughtful design.

To sum up, the role of UX and IxD in SNSs is paramount. By creating engaging platforms that foster meaningful connections and enhance user satisfaction, UX and IxD designers go beyond functionality. Thoughtful interface design, seamless interactions, and addressing privacy concerns empower users to navigate and engage with SNSs based on their preferences. Promoting mindful SNS usage and active interactions contributes to optimizing users' well-being. However, there is a crucial gap that needs to be addressed: UX and IxD designers often lack the necessary support to fully consider design dimensions that empower users and enhance their subjective well-being. Bridging this gap requires recognizing the importance of user self-awareness in the context of UX and IxD, and integrating insights from collaboration with researchers to further enhance the SNS experience.

2.4.1 User Self-Awareness

The meaning of awareness is 'knowledge or understanding of a situation or subject at present based on information or experience' (Cambridge University Press, n.d.), while self-awareness pertains to the ability to direct one's attention toward oneself and perceive oneself as an object of focus (Morin, 2011). Even more, the research by Kalinin and Edguer, 2023 states that self-awareness harbors internal self-aspects of one, such as emotions and thoughts along with the public self-aspects, including physical appearance and behaviors. Indeed, self-awareness involves multiple dimensions. Firstly, self-awareness encompasses self-reflection, which allows users to internalize standards of behaviors, assess their compliance with these standards, and reflect on their actions about overarching principles (Silvia & O'Brien, 2004). A study conducted by Dishon et al., 2018 indicates that when individuals' level of self-awareness is enhanced, they tend to assign greater significance and meaning to the decisions they make. Secondly, self-awareness also enables individuals to develop their self-regulation as they make evaluations of their actions, behaviors, and emotions compared to the standards they define for themselves (Kalinin & Edguer, 2023). Baumeister et al., 2007 define self-regulation as the ability of an individual to modify their responses or internal states, often by overriding a dominant or automatic response and substituting it with a less common but more desirable response. Lastly, similar to the concept of self-regulation, self-control involves managing and directing one's thoughts, emotions, and behaviors. However, self-control encompasses two distinct dimensions: restraint and impulsivity (Carver, 2005). Restraint involves a predisposition towards being thoughtful, disciplined, and exerting deliberate control over one's actions; on the other hand, impulsivity entails a tendency to act spontaneously, and without careful consideration (Cudo et al., 2020). On the basis of these dimensions, lacking self-awareness poses challenges to individuals' ability to empathize with others, exhibit self-control, achieve creative outcomes, and attain feelings of pride and elevated self-esteem (Silvia & O'Brien, 2004). Likewise, Kalinin

and Edguer, 2023 indicate that people with higher self-awareness and who reflect on their self-inconsistencies are more prone to have improved self-control, heightened self-esteem, and positive affect.

Hereby, in the digital age, where SNSs have become an integral part of daily life, understanding and cultivating self-awareness can significantly impact users' well-being, interactions, and overall experience within these platforms. This self-awareness is particularly relevant in the context of SNSs, where individuals are constantly engaged in self-presentation, communication, and consumption of user-generated content. By being aware of their digital activities and their effects, individuals can evaluate the authenticity and congruence of their online personas with their offline identities. In this respect, self-awareness enables users to make intentional choices about the content they share, the interactions they engage in, and the communities they participate in, fostering a sense of personal integrity and authenticity within the digital realm. In addition, self-awareness in SNSs extends to understanding one's digital footprint and its potential consequences on privacy, reputation, and well-being. For instance, many Facebook users reported that they are not aware of privacy options offered by the platform and how much personal information is disclosed about themselves, even more, particularly younger SNS users have less concerned about their privacy (Acquisti & Gross, 2006; Hugl, 2011). Another study by Nagulendra and Vassileva, 2016 found that the problems and concerns that arise during the use of SNS stem from the lack of transparency and explanation about how ML-powered systems work and what user data is used; therefore, it leads to a worsening of users' SNS experience and satisfaction and, consequently, to a lack of user awareness. By recognizing the implications of their online presence, users can proactively manage their privacy settings, control the dissemination of personal information, and mitigate the risks associated with online interactions. Understanding the potential impact of their digital footprint empowers users to make informed decisions regarding the level of personal information they disclose and the boundaries they establish within their online relationships. In fact, personalized advertisements that align with users' preferences and tastes can also contribute to self-awareness. A study on the relationship between personalized advertisement in SNSs, privacy, and self-awareness by Zhu and Chang, 2016 shows that by delivering ads that align with users' preferences and tastes, users' concerns associated with privacy are minimalized, thus pertinent relevant advertisements enhance self-awareness, which at the end, contributes users' overall satisfaction and motivations to continue using the platform. Furthermore, self-awareness within SNSs involves recognizing the influence of social dynamics and external factors on one's behaviors and emotions. Users can develop an awareness of the persuasive tactics, social pressures, and emotional triggers present within SNS environments. By understanding how these factors can shape their behaviors and emotions, individuals can exercise critical judgment, resist potential manipulation, and protect their well-being. This heightened self-awareness allows users to engage with SNSs more

consciously and navigate the platforms with a greater sense of autonomy and self-determination. In fact, in their study, Kalinin and Edguer, 2023 establish a relationship between self-awareness and social media usage. They found that self-control played a significant role as a mediator, highlighting its importance as a consequence of self-awareness. The study demonstrated that improved self-awareness and self-control can lead to increased self-esteem, positive affect, and reduced negative affect. These findings indicate that self-control is crucial in moderating the negative association between self-awareness and social media usage. Additionally, self-control acts as a mediator between social network site usage and self-awareness, suggesting that heightened self-awareness enhances self-control, thereby influencing patterns of social media usage.

In conclusion, self-awareness plays a vital role in the digital age, particularly within SNSs. It enables users to evaluate, make intentional choices, and manage their decisions for privacy and well-being. Self-awareness encompassing different dimensions, such as self-reflection, self-regulation, and self-control, enables individuals to empathize with others, exhibit self-control, achieve creative outcomes, and foster feelings of pride and elevated self-esteem. By aiming for self-awareness in SNSs, UX and IxD designers can enhance users' experiences, interactions, and overall well-being in the digital realm.

2.4.2 The Role of UX and IxD Designers as Mediators in Shaping User Experience

UX and IxD designers involved in the development of SNSs play multifaceted roles that significantly impact the user experience, interactions, and overall dynamics of these platforms. Acting as mediators between users and SNSs, designers have the power to shape and enhance the SNS landscape for positive user experiences, aiming to optimize user satisfaction, well-being, and meaningful connections (see Fig. 2.24).

As a designer, the mediator's role entails several key responsibilities. Firstly, designers are responsible for catering to mediation between humans and the world. The role of designers has evolved to address a wide variety of complex issues, requiring new knowledge and skills, and since societal issues and recent technologies are in constant change and growth, designers need to recognize these emerging societal issues and technologies (Kirschner & Norman, 2021). For example, designers need to be aware of societal and ethical issues that arise within SNSs, such as cyberbullying or discrimination against individuals. They need also to consider the ethical implications of ML algorithms employed in these platforms, which can have biases and impact user privacy. Dove et al., 2017 state that the role of UX designers is not only limited to improving the usability and interactions of the products and services but also requires focusing on understanding and leveraging the ML algorithms to drive innovations in creating products and services that harness the power of advanced systems and deep understanding of users and the world. By being cognizant of these challenges and ML
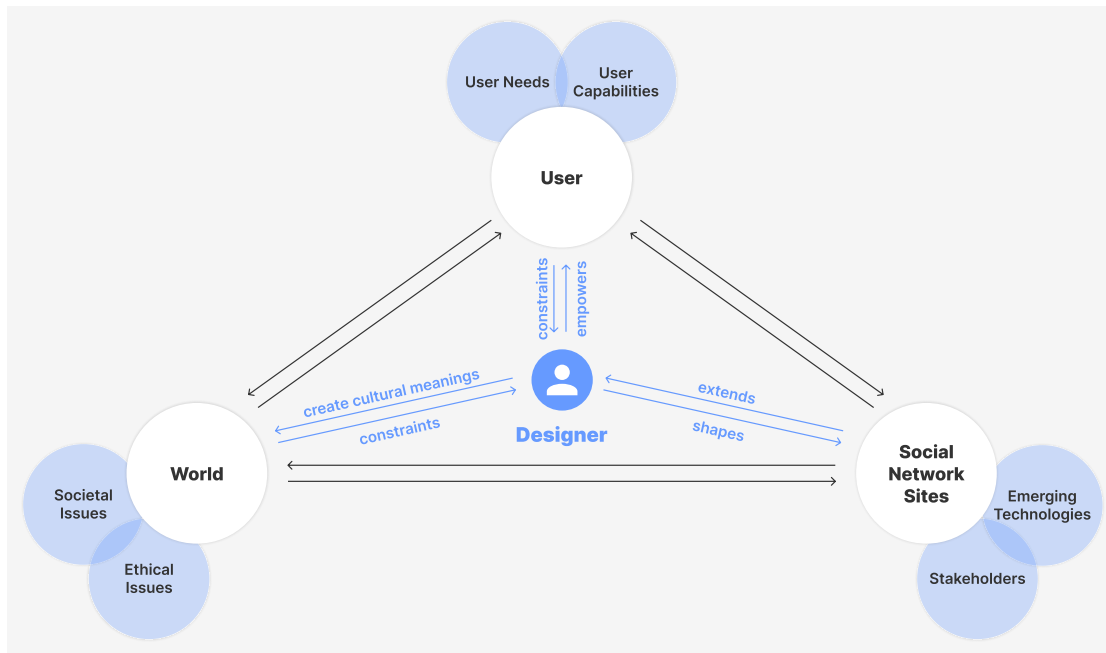
Figure 2.24 The role of designers as mediators

algorithms, designers can actively work towards creating SNSs that not only deliver exceptional user experiences but also foster inclusivity, cultural sensitivity, and social awareness.

In addition to recognizing the emerging circumstances in society, designers need to take into consideration their own power to create new cultural meanings through their design interventions. Grant and Fox, 1992 emphasize that designers not only create practical solutions for user problems but also create and transform cultural meanings with their design interventions. Within the landscape of SNSs, designers have the power to actively produce and transform cultural meanings through their design interventions, which could bring several impacts that are explained in the previous section of *Impacts of using SNSs*. To exemplify this, these platforms encourage individuals to share and express their personal lives and thoughts, but in the meantime, by providing this opportunity, designers implicitly produce a new cultural meaning that can allow the normalization of over-sharing personal lives, and seek approvals of other individuals. Hence, to fulfill their role as mediators effectively, designers need to possess a deep understanding of the social and cultural contexts in which SNSs operate. This understanding allows designers to comprehend the full extent of their own roles in shaping the SNS ecosystem. Therefore, by integrating a deep understanding of societal, cultural, and ethical considerations into their design processes, designers can be the bridge between the users and these platforms aiming to promote the well-being and positive experiences of SNS users while addressing the complexities of the world in which these platforms operate.

Besides, as intermediaries, one of the primary roles of designers is to understand users' needs and unify them into design decisions by collaborating with other stakeholders of the product and services, through their expertise and abilities (Ventura, 2011). UX and IxD designers strive to create design solutions that are intuitive, accessible, and enjoyable for all users, advocating for user-centered design principles, which involve utilizing different research methods, such as conducting ethnographic research or gathering user feedback through usability tests (Ventura, 2011). Regarding this, designers are responsible for acting as advocates for the users, ensuring that their voices are heard and their interests are represented throughout the design process of the SNSs. By bridging the gap between users and SNSs and effectively communicating with various stakeholders, such as SNS developers, engineers, and other actors who play roles in creating the user experience, they become the translator of users and ensure that the design decisions made align with user expectations and enhance their overall experience.

Furthermore, designers as mediators for users aim to empower users to harness their own abilities and unlock their full potential in problem-solving. In Ezio Manzini's article, *Design Research for Sustainable Social Innovation*, even though he did not specifically discuss digital products, his considerations can be associated with the context of SNS. Manzini, 2007 utters that designers can no longer act as sole directors of design, as in today's world, everyone can be a designer. Additionally, he declares that for the active well-being of individuals, users need to be supported and embraced by designers as active contributors and participants in the solution, rather than viewing them solely as part of the problem (Manzini, 2007). Accordingly, in translating this vision to SNS, designers need to act as mediators between users and the platform, recognizing that users have unique and private experiences and have the power to create their own values, such as the content they produce and share on their profile. Therefore, SNS designers now need to mediate and collaborate with users, recognizing users' individual experiences, values, and contributions. Even more, designers play a crucial intermediatory role in creating safer environments to ensure an increase in user engagement (Z. Howard & Melles, 2011). By incorporating safety features, privacy controls, and proactive moderation mechanisms, designers can enhance the overall well-being of users and foster positive and secure user experiences in the digital world of SNSs.

By embracing these dimensions, UX and IxD designers can effectively mediate between users and SNSs, shaping platforms that optimize user satisfaction, well-being, and meaningful connections. Their multifaceted role as mediators contributes to the positive evolution and impact of SNSs in the digital landscape. In an ever-evolving digital world, the role of UX and IxD designers as mediators continues to be vital in shaping the future of social networking experiences.

Chapter 3

METHODOLOGY

This chapter describes the research methodology used in the thesis. Firstly, the research approach is discussed, which combines both quantitative and qualitative methods, such as an online survey for quantitative data, participant observation with self-observation and self-reporting study, and benchmarking research for qualitative data collection. The chapter then delves into the various research stages, starting with a preliminary study, followed by the complete participant observation that includes self-observation and reporting study as part of the participant observation method. The chapter then continues with the main study which consists of a literature review, online survey, and benchmarking research as well as the explanation of each of their structure, sampling strategy, and recruitment methods. The chapter is concluded with data collection, which is also a significant component of the methodology chapter.

3.1   Research Approach for the Study

Qualitative research is a methodological approach seeking to examine and understand the subjective interpretations and meanings that individuals or groups attribute to a social or human issue, and the nature of this research entails developing research questions and methodologies, collecting data in the natural setting of the participants, and analyzing the data through an inductive process that moves from specific instances to general themes (Creswell, 2009). The data collected and analyzed in qualitative research is predominantly non-quantitative and includes textual materials, such as interview transcripts, field notes, and documents, as well as visual materials, such as artifacts, photographs, video recordings, and internet sites (Saldaña, 2011). On the other hand, Creswell, 2009 defines quantitative research as an approach in which researchers test objective theories and investigate the correlation between variables through a primarily numeric or statistical approach of data collection.

In light of these explanations, this thesis study utilized a combination of both qualitative and quantitative research approaches, which is the third research approach called the mixed research approach which involves both qualitative and quantitative data to gain a more exhaustive understanding of a research problem (Creswell, 2009). In the preliminary study, qualitative research methods were used to gain a general understanding of the field of work and to identify research questions. The research benefited from participant observation as a self-observation study and qualitative data were collected through self-report methods, which helped in formulating research problems. Additionally, a preliminary review of existing literature was also conducted, which can be considered a qualitative research method.

In the main study, the thesis also employed both qualitative and quantitative research methods. A literature review was conducted, which is a qualitative research method that involved a systematic review and analysis of existing literature and studies relevant to the research problem. This helped to establish a strong theoretical foundation for the research and identify gaps in the existing literature. Moreover, as a quantitative research method, an online survey allowed the gathering of primary quantitative data from a large sample of participants. The collected data was then analyzed using quantitative research analysis techniques to identify patterns and relationships. Furthermore, the research conducted benchmarking research, which is a form of comparative analysis used in both qualitative and quantitative research. The benchmarking process involved comparing the research findings with other studies to validate results and diagnose areas for design interventions.

In conclusion, the thesis combined both qualitative and quantitative research approaches, with the preliminary study using mostly qualitative research methods and the main study using both qualitative and quantitative research methods. The combination of these research approaches allowed for a more comprehensive understanding of the research problem and provided both quantitative and qualitative data to support the findings.

3.2   Research Plan

The master's thesis could be divided into two research phases, which are the preliminary study and the main study. Initially, the research started with the preliminary study, where the preliminary review was employed to refine the research question and identify knowledge gaps by conducting the preliminary review of existing literature related to the research problem, such as SNSs, ML algorithms, and ethical aspects of SNS use. Additionally, in the phase of the preliminary study, the participant observation was carried out in order to make a self-observation and reflection on a one-week SNS user experience. The study was conducted as a complete participant observation, which is a research method, where the researcher

thoroughly immerses themselves in the field of study, and observes and records social interactions and activities in the natural environment of the participants (Dourish, 2006; Schensul & LeCompte, 2012).

After investigating the gaps between user needs and problems in the user experience, and gathering in-depth insights into users' SNS experiences through the phase of the preliminary study, the research continued with the main study phase, which included more structured methods, including, literature review, online survey and benchmarking of the existing design interventions to evaluate the design opportunities and develop a new hypothesis. In the main study phase, the first step was to conduct a comprehensive literature review to identify and analyze existing research and interventions related to SNSs, user experience, and user self-awareness. This literature review served as a foundation for developing the research hypotheses for the main study. Then, an online survey was conducted to gather data from a larger sample of SNS users. The survey questions were designed to explore the user experience of SNS, including their motivations for using SNS, their perceptions of SNS use, and the impact of SNS use on their well-being. The survey data was analyzed using statistical techniques to identify patterns and trends in user behaviors and preferences. In addition to the literature review and online survey, benchmarking of existing design interventions was conducted to evaluate the design opportunities for improving the user experience within the context of SNSs. This involved analyzing and comparing the design features of various SNS guidelines and toolkits, identifying weaknesses and design gaps in the available solutions, and exploring the potential for new design interventions to address user needs and preferences. Finally, the research findings were synthesized to develop a new hypothesis for the design that enables SNS designers to create positive user experiences. It aims to capture the focus on promoting well-being and emphasizes the goal of creating positive experiences on SNSs.

3.3   Preliminary Study

The preliminary study was conducted to gain a general understanding of the field of work and identify the research questions before the main research study. The purpose of this study was to gather information to guide the research process, including the formulation of research questions and the selection of appropriate research methods. It involved a preliminary review of existing literature, such as academic journals, books, and other relevant sources of information. With the help of this preliminary review, the key concepts, and frameworks, such as the concepts of social media and social network sites, the differences between AI and ML, and gaps in knowledge related to the research problem were identified, as well as potential research questions. In addition to the

preliminary review, the preliminary study also played a significant role in the research process by the incorporation of collecting and analyzing qualitative research methods through participant observation. In the following section, the process of the participant observation study is explained.

3.3.1   Participant Observation

Qualitative data collection techniques could involve observation, interviewing, and document analysis, which are the tools of the broader term of ethnographic methods (Kawulich et al., 2005). Participant observation is one of the qualitative research techniques for qualitative data collection, and Schensul and LeCompte, 2012 define participant observation as a "process of learning through exposure to or involvement in the day-to-day or routine activities of participants in the research setting" (p. 83). This method is used in many fields, the most common ones are anthropology, sociology, and psychology. Ethnographers or researchers participate in the group or community being studied and make observations and take notes in order to gain an insider perspective of the group's behaviors, activities, and values. Within the scope of the master's thesis, the participant observation study has a remarkable role in identifying the research problem and hypothesis. As one of the purposes of this study is to understand the needs and behaviors of SNS users, and the feeling and thoughts of users during the usage of SNSs, participant observation is the primary research method to collect contextual and deep insights and to observe the user interactions and activities carried on while using the platforms. Even more, the underlying reason for utilizing participant observation as a primary qualitative research method in the study is that the experience of SNS use is a highly individual and private experience, and gathering information and insights about users' SNS experiences might not be straightforward without observing them and understanding the feelings and attitudes of users during SNS use.

Research questions related to participant observation:
RQ.1. How do SNSs make users feel, and how do these emotions affect their behaviors and interactions on these platforms?
RQ.2. What are the current user needs and limitations of SNS features, and how can they be better addressed?

3.3.1.1   Participant Observation Structure

Participation involves being physically present in a setting and engaging with the ongoing activity or event, and the presence of the researcher is necessary to define participation in the observed event (Schensul & LeCompte, 2012). This method has five types, ranging from non-participation to complete participation depending on the level of involvement of the researcher in the population of the study area (Spradley, 1980). For this research study, it was determined to conduct the complete participant observation method, which requires the highest level of involvement of the

researcher and is carried out with the complete integration of researchers into the research field. Indeed, as I am already an SNS user and a member of this population, the participant of the study was me, and I made self-observation and documentation of my own SNS experience. The significance of choosing complete participant observation for this research lies in its ability to provide a unique and first-hand perspective on the research topic. By immersing the researcher in the population being studied and experiencing the same activities and events as other users, the researcher could gain a deeper understanding of their behaviors, attitudes, and experiences. Moreover, the method could provide rich and detailed data that may not be captured through other data collection methods. It might also help the researcher to identify and understand certain nuances or aspects of the SNS experience that may have been overlooked or misunderstood through other methods. Thus, in the case of this study, using the method of complete participant observation allowed the researcher, me, to gain an in-depth understanding of the experiences and challenges of using SNSs from the perspective of a user. By participating in the study, I got the opportunity to increase the validity of the findings as a researcher. By directly using SNSs and experiencing their features, I could provide more authentic and valid data that accurately reflects the experiences of the individuals being studied. Consequently, the in-depth knowledge and perspective gained can be particularly valuable in developing design interventions to improve user experience on SNSs.

In light of these, the length of the complete participant observation was decided as one-week length, and before beginning the one-week journey of self-observation, a semi-structured self-diary form was prepared by focusing on the research questions to not overlook the aim of the study, including several closed-ended and open-ended questions that might be helpful while observing and taking notes in order to ease remembering and documenting the experience. In addition to the semi-structured part, the diary study contained a free form to allow the participant to express the feelings and thoughts that occurred during the SNS use more freely to not overlook the little and might be the salient insights (see Appendix A). Besides these, the study of self-observation and self-report was organized over three SNSs, which are Instagram, Twitter, and LinkedIn, with the consideration of several factors, such as the popularity of the site, having a wide range of demographic information of users, differentiating purpose of use, such as personal and professional use, and the diversity of the site features, which has enabled identifying potential associations of the variety of challenges and concerns on these SNSs.

3.3.1.2   Participant Observation Data Collection and Analysis

After the one-week observation and documentation period, the collected data were analyzed using a range of qualitative analysis techniques to ensure that the findings were both comprehensive and nuanced. This process of qualitative data analysis could be reviewed in five stages: (i) compiling the data into practical forms to detect relevant answers to the research questions; (ii) disassembling data to create

meaningful categories; (iii) reassembling data categories to compose themes, which describe the patterns embedded in data; (iv) interpreting data, patterns, and themes into credible and representative values that give an understanding to the study; (v) drawing conclusions based on the interpretations from collected data and generated themes by addressing the research questions (see Appendix B). One specific technique used for data analysis was content analysis, which involved analyzing the content of data and making inferences from the recorded text (Mayring, 2015), and helped to identify recurring themes and patterns within the data. In addition, the qualitative analysis of data included the technique of constant comparative analysis, which involved finding an insightful data point and starting to compare it with all the data from other days to capture the similarities or differences in order to generate themes for potential associations among the collected data (Thorne, 2000). Moreover, by comparing data on the participant's emotional states before and after using specific features of the site, valuable insights were generated regarding the challenges and concerns associated with SNS use. This analysis aimed to understand how emotions changed based on interactions and identify emotional patterns and associations between different interactions. Emotional models from several researchers, such as Paul Ekman and his colleagues, as well as Pieter Desmet, were utilized to analyze the emotional patterns observed during the one-week process. The combination of these approaches helped uncover the motivations driving users to engage with SNSs and provided a deeper understanding of the emotional dynamics associated with different features and interactions on the platform.

Ultimately, after completing data collection and analysis, the results of the participant observation and its analyzed outcomes were included in the main study. This comprehensive approach to data analysis helped to ensure that the findings were credible, representative, and relevant to the research questions and that potential associations and insights were identified and explored thoroughly. Even more, the results of participant observation allowed the researcher to conduct follow-up studies, such as an online survey and benchmarking study, in the main study to validate the insights and gather additional data that could provide a more comprehensive understanding of the research topic.

3.4   Main Study

The main study is the phase where the primary research was conducted to further investigate the research topic, examine identified problems during the preliminary study, and gain a more comprehensive understanding of the research problem. It involved a number of research methods and techniques, such as literature review, data collection, and analysis. The literature review incorporated a systematic review and analysis of existing literature and studies that are relevant to the research problem. This process helped establish a strong theoretical foundation for the research and to identify gaps in the existing literature that the research aims to

address, while data collection provided gathering primary data through various methods, including the online survey. The collected data were then analyzed using both quantitative and qualitative research analysis techniques to identify patterns and relationships. In addition, the main study also consisted of a benchmarking examination, which was the process of comparing the research findings with other studies in order to validate results and identify areas for design interventions. This benchmarking process has ensured the accuracy and reliability of the research findings and enhanced the credibility of the study. Overall, the main study phase of the master's thesis was an essential part of the research process and required a high level of rigor, objectivity, and attention to detail to sustain the accuracy and reliability of the research findings. In the following section, the procedure of literature review, online survey, and benchmarking are presented.

3.4.1 Literature Review

The literature review of the research aimed to explore the relevant literature on SNS use, ethical issues on SNSs, and AI applications on SNSs, and allows the researcher to identify the existing knowledge, theoretical frameworks, concepts, and gaps in the focused research field. Thus, the inclusion and exclusion criteria of articles were defined in order to identify the relevant studies and ensure that only relevant and high-quality sources are used (see Fig. 3.1). For this study, the inclusion criteria for articles were those that contained the relevant keywords, such as "Impacts of using SNS", "Problems of using SNSs", "AI applications on SNSs", and "ML algorithms on SNSs", in their titles or contexts, as well as those addressing a theme related to the research questions. Furthermore, the types of publications considered were articles, credible blog articles, and reports published by the SNS providers. On the other side, the exclusion criteria included unpublished articles, those not addressing a theme related to the research questions. Lastly, the publication date of the articles was also reckoned while examining the literature review to ensure that the technology referred to in the articles was newsworthy, and the problems that arose were still current and valid.

Inclusion criteria	Exclusion criteria
1. *Including relevant keywords, such as "Impacts of using SNS", "Problems of using SNSs", "AI applications on SNSs", and "ML algorithms on SNSs"* in their titles or contexts 2. Addressing a theme related to the research questions 3. Different types of publications from the credible sources, such as articles, blog articles, reports published by the SNS providers 4. Publication date in order to ensure that the technology used is current and newsworthy	1. Unpublished articles 2. Not addressing a theme related to the research questions 3. Obsolete and out-of-date publications

Figure 3.1 Article sampling inclusion and exclusion criteria

3.4.2   Online survey

As a part of the main study phase, the online survey was carried out by aiming to investigate the design directions for enhancing the user experience on SNSs and to gain insights into user needs, problems, and behaviors on those platforms. To achieve this goal, the survey covered several search questions related to the design dimensions of SNS interfaces, limitations, and the problems encountered during SNS use. In addition to this, by running a survey, I aimed to recruit a diverse group of participants who use SNSs, as well as to gather quantitative data with the integration of both closed-ended and open-ended questions. Ultimately, the collected data was analyzed with the use of appropriate analysis techniques to uncover insights and patterns.

Research questions related to the online survey:
RQ.1. What are the design dimensions in SNS interfaces that affect users' self-awareness, and how can these dimensions be utilized to improve user experience?
RQ.2. How do SNSs make users feel, and how do these emotions affect their behaviors and interactions on these platforms?
RQ.3. What are the current user needs and limitations of SNS features, and how can they be better addressed?
RQ.4. What are the ethical implications of SNSs and emerging technologies, such as ML algorithms, and how do these implications affect user experience and interactions?

3.4.2.1   Online Survey Structure

As a quantitative research study, the survey, which discoursed the research questions, was designed to examine and obtain insights on SNS uses, SNS experiences, and the self-awareness of individuals about their use. The online survey was divided into different sections, including the demographic section, the SNS experience of individuals section and the section related to the self-awareness of their SNS uses. The demography section was for collecting information about the participant's age and gender, while the SNS experience section consisted of a number of closed-ended and open-ended questions, such as which SNSs they use, how often they interact with them, and what the negative impacts that they have experienced during their use are, such as physical and mental problems, as well as how they feel while using SNSs. The section on the self-awareness of individuals on their SNS uses was the final part of the survey, where the participants answered several questions related to their level of self-awareness on their use, ML algorithms or ethical issues on SNSs, and the strategies or methods they use to increase their privacy or overall experience.

The recruitment method used for this online survey was a combination of *convenience sampling* and *snowball sampling*. Convenience sampling refers to selecting participants based on their accessibility and convenience (Elfil & Negida, 2017). In this case, the survey was conducted online and established through Google Forms to spread the

survey easily and reach the large masses; in fact, after organizing the online survey, it was distributed on different social network sites, including Instagram and Twitter, and collected 64 responses in a week. Additionally, the survey link was shared with several communities on social media, such as WhatsApp groups, two Facebook groups where a large number of members from Turkey share their needs and concerns, and help and support each other, and a Discord channel. Furthermore, the survey link was also sent to one of the Twitter communities called Design Twitter, where members post content and discuss topics on UX, UI, visual and product design since the members of this community might have shown interest in participating in the survey. This approach suggested a form of snowball sampling, as participants within these communities were encouraged to participate in the survey and potentially refer others who met the criteria or had relevant experiences (Berndt, 2020). By combining convenience sampling and snowball sampling, the study aimed to reach a diverse pool of participants and tap into specific communities or networks where individuals with relevant experiences or interests could be found.

Besides these, participants were informed about the purpose of the study, the nature of the survey questions, and how the data will be used before completing the survey. The collected responses from this survey were analyzed using quantitative and qualitative analysis techniques to detect patterns and gain insights from the data, and the findings helped to draw the design conclusions for how the design might improve the SNS experiences of individuals.

3.4.2.2   Online Survey Questions

Survey questions could be seen in Appendix C. Survey questions can be grouped under three sections as follows:

- *Section for demographic information:* questions on participants' age and gender;

- *Section for SNS experience of individuals:* questions related to their SNS use, such as which SNSs they use, how often they interact with them, what the negative impacts they have experienced during their use are, and how they feel while using SNSs;

- *Section related to the self-awareness of their SNS uses:* questions related to their level of self-awareness on their use, ML algorithms or ethical issues on SNSs, and the strategies or methods they use to increase their privacy or overall experience.

3.4.3   Benchmarking Research

Benchmarking is described in various ways, but it can be loosely defined as a study of measuring the performance of a particular process, product, or service and comparing it with high-level applications, and aims to identify areas of improvement by evaluating the competing system or components based on specific characteristics (Anand & Kodali, 2008). Accordingly, within the phase of the main study of this research, benchmark research was conducted to analyze existing design solutions and identify areas where

the research study can contribute to the field of SNSs and develop a design intervention by learning from other solutions or best practices. In addition, with this benchmarking research, I aimed to collect qualitative data from the competitive analysis of available guidelines, tutorials, or toolkits on the use and design of SNSs.

3.4.3.1   Benchmarking Research Structure

Based on the research questions, benchmarking research was designed by following a structured process including several steps (see Fig.   3.2).   The first step in the benchmarking study was to define the research problem and objectives of this research. In this case, the research problem was to identify SNS design directions for enhancing user experience while the designers mediate responsibly between users and the most-advanced SNS technologies. The objective of the benchmarking study was to identify areas where the research study can contribute to the field of SNSs and develop a design intervention by learning from other solutions or best practices. The second step was to identify the benchmarking partners, which are organizations, products, or services that provide high-level practices or applications to compare against.   In this respect, the benchmarking partners were the organizations, institutions, or people who produce products and services for organizing the use and design of SNSs while the products that benchmark study focused on existing design solutions of these organizations, such as ethical guidelines, tutorials for privacy and safe use of SNSs, or toolkits on the use of SNSs.   Following this step, a set of measurements, including the scope of the solution, user group, and design features or dimensions, was determined in order to collect and analyze the available solutions. The collected data from the benchmarking partners were then analyzed to identify the areas of improvement, strengths, and weaknesses.   According to this benchmark analysis, possible design directions were determined.
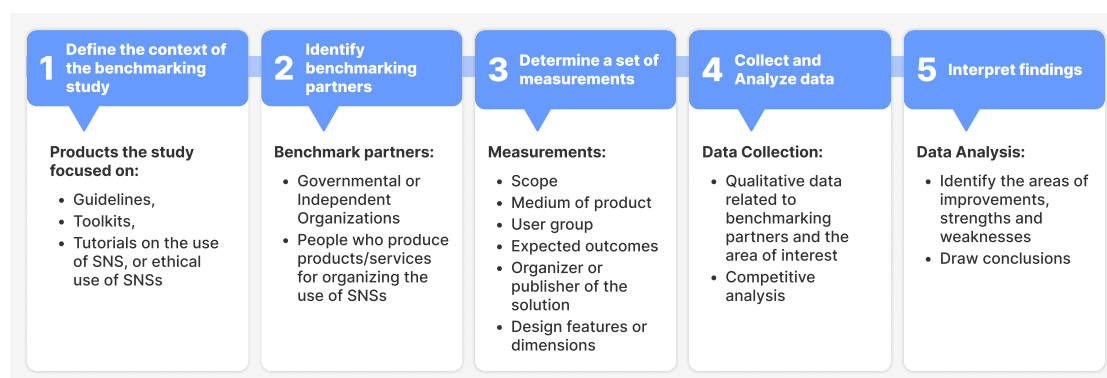
Figure 3.2 Benchmarking Research Process

Measurements:

- Scope

- Medium (Guidance, toolkit, blog article, website article, etc.)

- User group

- Expected outcomes

- Organizer or publisher of the solution

- Design features or dimensions

3.4.3.2 Benchmarking Research Data Collection and Analysis

In the benchmarking process, the research has categorized the benchmark partners into three centralized groups based on their focus areas: business and marketing, SNS design, and ethical SNSs use.

- *Business and marketing*: This category focuses on benchmarking practices related to the creation of social media content, business, and marketing strategies for SNS, such as brand recognition and growth with SNS use.

- *SNS design*: The benchmarking practices of this category are related to the design and functionality of SNSs. The collected design practices, such as design guides, guidelines, and toolkits, include guidelines for privacy design on SNSs, interface design, and AI design on SNSs.

- *Ethical SNS use*: In this category, the design partners, including governmental and independent organizations, produce guides, toolkits, or other user-supportive products that provide guidance or information for the ethical use of SNSs to different user groups from business, SNS users, to SNS designers and AI developers.

By organizing the design practices into these categories, the benchmarking research aimed to collect and analyze the best practices, and identify their strengths and weaknesses to develop a new design intervention for the improvement of SNS user experience. Chapter 4 will provide a detailed examination of the benchmarks within these three categories, shedding light on the metrics determined.

Chapter 4

RESULTS AND FINDINGS

This chapter presents the results obtained from both preliminary and main studies. These research studies employed various research methodologies to gather data and insights. The chapter specifically includes the findings from participant observation, online surveys, and benchmarking research. By utilizing different research methods, the chapter presents a comprehensive and well-rounded analysis of the research topic. The results derived from these research methods provide a multi-dimensional understanding of the subject, incorporating qualitative observations, quantitative data, and industry best practices.

4.1   Participant Observation Results

The results of the complete participant observation study revealed several key findings about the participant's motivations and experiences while using SNSs. First of all, it was understood that the participant's main motivations for using SNSs were correlated with information, and social interaction needs, which were connecting with family members and friends and getting information from others since the participant generally uses Instagram and Twitter when she feels lonely, bored or when she was offline on the site and afraid to miss important moments on the site. That is why, to meet these needs, her main interactions were checking her Instagram feed and Twitter feed and trends, giving reactions to shared content, and communicating through Instagram DMs (Direct Messages).

In other respects, while using Twitter, the participant's biggest apprehension was the fear of missing out since she generally uses Twitter for getting recent information, news, and updates from her followings, which showed that even though Twitter is a micro-blogging platform allowing users to share their opinions and feelings; for her, Twitter takes the place of traditional media. Thus, her expectations were related to being more aware of fake and misinformation on Twitter, and her emotions before Twitter use and after the use, particularly the negative emotions, on using the site were associated with the use of Twitter. On the other hand, the participant's Instagram use was mostly based on receiving social support; hence, she could feel

socially connected with stories, posts, and other types of content shared by the people that she follows to diminish her boredom and loneliness, which resulted in an apparent increase in her positive emotions. The disadvantages of Instagram for the user were related to the limits of ML algorithms of the site or the hidden or vague disclosure on the interface.

Besides these, if there is one value that the self-observation study of the complete participant observation revealed clearly, it was that; although using SNSs met the user's needs and made positive emotional changes, it did not emerge only one-dimensional emotions after the use. With each interaction on the site, emotions were evoked by a set of appraisals that are based on the user's personal evaluation, and according to these personal meanings, the interactions result in a pleasant emotion, an unpleasant emotion, or an absence of emotions (Jimenez et al., 2015). On this basis, the participant expressed positive emotions, such as happiness, amusement, and satisfaction when experiencing rewarding gratification by communicating with others or exchanging information. However, simultaneously with positive emotions, the user also experienced negative emotions due to the clash between her appraisals and the outcome of the interaction, which will be explained profoundly later in the section. These negative instances could be grouped under four main themes: the limits of the site's interface, the limits of ML algorithms of the SNSs, the use of SNSs, and the user's emotional concerns (see Fig. 4.1).

- *The limits of the site's interface*, which consist of the presence of hidden and vague privacy and safety settings, slow content reporting processes, and not providing explicit information about what user data is used;

- *The limits of ML algorithms of the SNSs*, refers to the different dimensions of ML algorithms impacting SNS experience, including personalization of feed and content, ads placements, suggestions and recommendations of contents, data privacy, information reliability, and safety;

- *The use of SNSs*, which refers to users' vulnerabilities towards fake news and misinformation on SNSs, and the lack of awareness regarding data protection and account settings. Additionally, the theme includes the user's own strategies to protect their data privacy;

- *The user's emotional concerns*, include fear of losing control over the account, worry about being surrounded by echo chambers or homogeneous content, and a feeling of invasion by suggested content.

Based on the individual consideration of the SNSs examined through the complete participant observation, the analysis of the study revealed several problems associated with Instagram usage (see Fig. 4.2). Firstly, the content reporting process was found to be slow, resulting in reported content remaining visible in the feed for an extended period. This delay in addressing reported content undermined the effectiveness of content moderation efforts. Additionally, the privacy and safety

The limits of the site's interface	The limits of ML algorithms of the SNSs	The use of SNSs	Emotional concerns
• Hidden, vague privacy and safety setting (etc. blocking words, ads preferences) • Interpretation of what data used, not providing explicit information • Slow process of reporting content	• Personalization of feed and content • Ads placements • Suggestions and recommendations of contents • Data privacy • Information reliability • Safety	• Being vulnerable towards fake and misinformation on the sites • Lack of awareness of how to protect own data and what the functions of SNS enabling users to change account settings • Developing strategies to deal with data privacy challenges	• Fear of losing control over the account • Worried about being surrounded with similar ideas, thoughts and contents • Feeling of being manipulated by homogeneous contents that hold a similar point of view • Feeling of invaded by suggested contents

Figure 4.1 Four main themes identified from data analysis of the participant observation study

settings on Instagram were identified as hidden and vague, making it difficult for users to locate and modify these settings. Even if changes were made, the system sometimes failed to function properly, further compromising user control and security. Lastly, the participant observed an invasion of suggested ads and sponsored content, which occupied a significant portion of the user's feed. These intrusive elements obstructed the visibility of content shared by the user's following list, potentially diminishing the overall user experience on the platform.

Instagram

Slow content reporting process	Hidden, vague privacy and safety setting	Invasion by suggested ads, and sponsored contents
• The process is slow, and the content remains in the feed after reporting. • Its viewability is not directly restricted by the system.	• Although there are various account settings (e.g. ads preferences), they are not quite visible. • Even if the settings have been changed, the system might not work properly.	• Suggested posts occupy lots of space on the user feed, and they obstruct contents published by user's following to be seen.

Figure 4.2 Participant's Instagram related concerns

Besides Instagram, the data collected from the self-observation and self-report of Twitter usage showed three major concerns (see Fig. 4.3). First and foremost, since the participant use Twitter as the main news source, the prevalence of fake news and misinformation on the platform was found to be problematic. There were no clear indications or mechanisms to help users discern whether the content they encountered was reliable or accurate. This lack of signals or prompts to question the validity of the information could contribute to the spread of misinformation and hinder informed decision-making. Secondly, the privacy and safety settings on Twitter were deemed inefficient. Despite the participant's efforts to mute or block certain words or accounts, the platform sometimes failed to fully filter out content associated with the muted or blocked elements. Algorithms overlooked punctuation marks and symbols, resulting in the continued display of undesired content. This limitation undermined the user's ability to create a tailored and safe Twitter experience. Finally,

the analysis highlighted the prevalence of similar and repetitive content in the user's feed. This abundance of redundant information diminished the visibility of content shared by the user's following list. The overemphasis on repetitive content reduced diversity and could create echo chambers, limiting exposure to different perspectives and hindering a well-rounded Twitter experience.
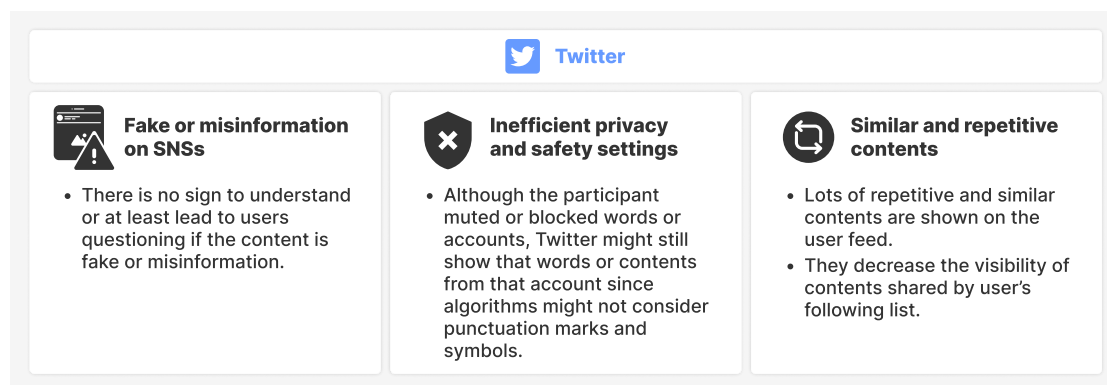
Figure 4.3 Participant's Twitter related concerns

Lastly, the analysis of the participant observation study regarding LinkedIn usage identified a specific issue, which was related to job recommendations on LinkedIn (see Fig. 4.4). According to the data collected from the one-week LinkedIn observation, the job recommendations provided by the platform did not mostly align with the user's profile and personal information, which indicated an incapability of the ML algorithms of LinkedIn. This mismatch between the user's qualifications, skills, and interests and the recommended job listings led to a lack of relevance and frustration for the user.
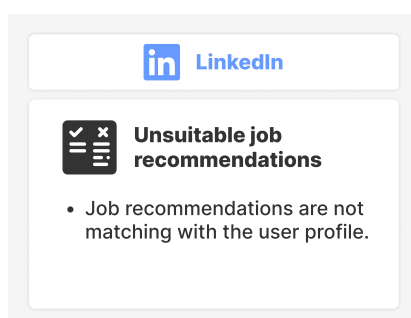
Figure 4.4 Participant's LinkedIn related concerns

Apart from these findings, the participant observation study provided valuable insights into the interpretation of data usage, strategies for privacy protection, and concerns about losing control over SNS accounts (see Fig. 4.5). These findings, along with the earlier identified issues, highlighted the importance of transparency, user self-awareness, and diversification of content. One notable finding was the lack of direct information in the main interfaces about the specific user data utilized by the platforms. This limitation made it necessary for the participant to infer what data might have been used based on their interactions. To address this, SNSs should strive for greater transparency, providing clear and accessible information about the data

they collect and how it is used. By empowering users with this knowledge, they can make informed decisions about their privacy. Moreover, the participant demonstrated proactive strategies to protect their privacy while using SNSs throughout the observation. Incognito tabs were utilized by the participant to prevent tracking, and she took extra measures to verify the information by consulting other sources or seeking input from friends and family. These privacy protection strategies highlighted the need for users to be vigilant and take an active role in safeguarding their personal information. Moreover, platforms need to continue to improve privacy settings and features, ensuring that users have effective tools to manage their online privacy. Another significant concern expressed by the participant was the fear of losing control over her account. This anxiety stemmed from the influence of suggested posts and ads, as well as the potential manipulation caused by being surrounded by homogeneous content with a similar point of view.

Interpretation of what data used	**Developing strategies to protect privacy**	**Fear of losing control on the account**
• No direct information in the main interfaces is given about which user data is used. • The participant usually interpreted what data might have been used based on the interactions she made.	• Using incognito tabs for not being tracked. • When seeing suspicious content, I tried to confirm the information by checking other sources or asking my friends/family. • Trying to quickly skip ads or recommended content in my feed in case algorithms consider time spent on content.	• Concerned about losing my control on my account through suggested posts, ads. • Worried about being surrounded and manipulated by homogeneous contents that hold a similar point of view

Figure 4.5 Three insights identified from the participant observation

4.1.1   Analysis of Emotional Patterns

As part of the participant observation analysis, the collected data were examined to identify emotional patterns and understand how emotions changed based on user interactions. The analysis aimed to uncover the driving concerns behind users' engagement with social media sites and establish associations between different interactions. The analysis drew upon emotional models developed by researchers such as Paul Ekman and Pieter Desmet. Emotions could be classified in various ways, depending on the theoretical framework or approach used, and each classification system has different criteria, such as the valence (positive and negative) and arousal (intensity) (Tracy & Randles, 2011). However, one commonly used classification system is dependent on Ekman's study. Their model consists of six basic emotions: anger, surprise, disgust, enjoyment/happiness, fear, and sadness, which are defined based on the observation of facial expressions, and the seventh emotion, contempt, is also presented as another strong emotion that is considered to be universally recognized (Tracy & Randles, 2011). However, it is important to note that complex emotions, which are combinations of multiple emotions and are not easily detectable through facial examination, are also present in the research. Examples of such complex

emotions include anxiety, loneliness, and stress, which play a significant role in users' experiences on SNSs. Another noteworthy framework utilized in the analysis is Pieter Desmet's *PrEmo*. This framework offered a comprehensive understanding and analysis of emotions and encompassed a range of pleasant and unpleasant emotions. The pleasant emotions identified in the PrEmo framework include desire, pleasant surprise, inspiration, amusement, admiration, satisfaction, and fascination. On the other hand, the unpleasant emotions comprise indignation, contempt, disgust, unpleasant surprise, dissatisfaction, disappointment, and boredom (Desmet, 2002). By incorporating this framework, the analysis captured a broader spectrum of emotions experienced by users during their interactions on SNSs.

Considering these emotional models, the participant observation analysis provided insights into the complex and diverse emotional experiences of users. It went beyond the basic emotions to encompass a wider range of feelings, including those arising from personal concerns and social interactions. By understanding the nuances of these emotions, SNSs could better cater to users' emotional needs and create an environment that fosters positive experiences while addressing the negative aspects that may arise.

In light of these considerations, the participant's interactions on SNSs can be classified into two groups: *primary* and *secondary interactions*. Primary interactions include frequent actions, such as checking feeds, trends, explore, and recommendations, watching videos, and communicating through DMs. Secondary interactions are subsequent actions, including finding and changing the privacy settings, reporting content, and labeling content or topic as uninteresting (see Fig. 4.6 and 4.7). In fact, the reason for naming them as secondary interactions is that the emerging emotions, which arise during the use of the site, drive the participant to take a subsequent action.

As mentioned above, emotional changes were not one-sided. Using SNS, predominantly, met the basic needs of the participant, such as receiving informational and social support, and it meant that the user's appraisal of the interaction matched the user's concerns, and the user experienced positive emotions. However, using SNS did not bring only positive emotions to the user. With the emerging conflict between appraisal and concerns, the user could experience negative emotions. Fig. 4.8 shows the classification of emotions based on the user's primary and secondary interactions, and it separates emotions that are elicited because of user interactions into two emotions, positive and negative. After the primary user interactions, the participant's positive emotions were happiness, satisfaction, amusement, and relief since she achieved what she aimed for before the site usage. Moreover, the negative emotions after the primary interactions were mainly disappointment, dissatisfaction,

☺ positive emotions   ☹ negative emotions

Figure 4.6 Emotional pattern analysis of primary interactions

What was the concern drive to use site?	What emotions were the source of concerns?	What actions were taken?	What was the appraisal?	What emotion have been experienced?
Primary Interactions — • Fear of missing out • Feeling disconnected from the world • Need of information exchange	☺ • Seeking / ☹ • Anxiety • Loneliness	Checking feeds, trends, and explore	• Feeling socially bridged • Feeling updated	☺ • Satisfaction • Happiness / ☹ • Disappointment (seeing similar contents) • Indignation (due to seeing violent/sexist content)
• Need of feeling connected • Having a sense of belonging	☹ • Boredom • Loneliness		• Not feeling bored • Feeling socially bridged	☺ • Amusement • Happiness / ☹ • Boredom (seeing similar contents) • Anxiety (surrounded and manipulated by similar contents)
• Feeling of addiction • Feeling of obligation	☹ • Anxiety • Stress		• Feeling relived	☺ • Relief / ☹ • Indignation (due to being invaded by suggested content) • Disappointment (seeing similar contents) • Anxiety (fear of losing control/privacy of the account) • Regret and guilt
• Need of escaping from the real-world stress	☹ • Stress		• Decreasing stress	☺ • Relief / ☹ • Sadness • Anxiety (surrounded and manipulated by similar contents)
• Need of feeling connected • Having a sense of belonging	☹ • Boredom • Loneliness	Watching videos	• Having fun	☺ • Amusement • Happiness • Satisfaction
• Need of escaping from real-world stress	☹ • Stress		• Feeling relived • Having fun	☺ • Relief • Happiness
• Need of feeling connected • Having a sense of belonging • Need of escaping from real-world stress	☹ • Loneliness • Stress	Communicating via DMs	• Socially bonded • Feeling relieved and happy	☺ • Happiness • Relief • Satisfaction

indignation, and anxiety arising out of three disadvantages of SNSs that were defined above the limits of ML algorithms of the SNSs, the use of SNSs, and the user's emotional concerns.

Prior to primary interactions, the participant's negative emotions were mostly unrelated to SNS use or site limitations, except for anxiety related to addiction and the obligation to check the site. Instead, these negative emotions stemmed from real-world concerns. With respect to secondary interactions, before the site use, the participant was always under the influence of negative emotions, and it was apparent that only the negative emotions, such as anxiety, anger, disappointment, indignation, sadness, and unpleasant surprise, impulsed her to take a subsequent action which

Figure 4.7 Emotional pattern analysis of secondary interactions

*The analysis was created based on the results of the participant observation study.

positive emotions | negative emotions

	What was the concern drive to use site?	What emotions were the source of concerns?	What actions were taken?	What was the appraisal?	What emotion have been experienced?
Secondary Interactions	• Feeling of addiction • Feeling of obligation	😊 • Interest ☹ • Anxiety	Checking recommended posts and ads	• Experiencing pleasant surprise • Getting inspiration • Being interested in contents	☹ • Unpleasant surprise (due to seeing unsuitable recommendations) • Disappointment (seeing similar suggestions)
	• Frustration by seeing so many irrelevant content, ads • Feeling of invaded by them	☹ • Anxiety • Sadness • Anger • Disappointment	Finding or Changing privacy settings	• Seeking a solution	😊 • Relief ☹ • Unpleasant surprise (discovering a hidden setting) • Dissatisfaction and Anger (due to the system functioning) • Disappointment and Indignation (resulting with leaving the site)
	• Frustration by seeing violent and sexist content	☹ • Anxiety • Sadness • Indignation • Disappointment	Reporting content	• Feeling relieved	😊 • Relief ☹ • Dissatisfaction and Anger (due to the system functioning) • Disappointment and Indignation (Leaving the site)
	• Frustration by seeing so many irrelevant content, ads • Feeling of invaded by them	☹ • Anxiety • Disappointment • Unpleasant surprise • Indignation	Labeling content or topic	• Feeling relieved	😊 • Relief ☹ • Dissatisfaction (due to continuing to show similar contents)

Figure 4.8 The diagram shows the classification of emotions based on the user's primary and secondary interactions.

	Primary Interactions		Secondary Interactions	
	Before SNS use	After SNS use	Before SNS use	After SNS use
😊 Positive Emotions	• Seeking • Interest	• Satisfaction • Happiness • Amusement • Relief		• Relief
☹ Negative Emotions	• Loneliness • Boredom • Anxiety • Stress	• Disappointment • Indignation • Boredom • Anxiety • Regret • Guilt • Sadness • Unpleasant surprise	• Anxiety • Sadness • Anger • Disappointment • Indignation • Unpleasant surprise	• Unpleasant surprise • Dissatisfaction • Anger • Disappointment • Indignation

could provide enhancement in the user's SNS experience. In fact, the underlying reasons for these negative emotions were often associated with the previously defined disadvantages of SNSs in this study. The only positive emotion resulting from

78

secondary interactions was the relief, experienced when the site and its functions provided a better service. Otherwise, unpleasant surprise, dissatisfaction, disappointment, anger, and indignation were common negative emotions arising from site usage.

4.1.2   Participant Observation Summary

According to the results of the complete participant observation study, it could be inferred that enhancing user's self-awareness could improve their SNS experience; because this participant observation was conducted employing the complete participation method, and indeed, this self-examination and observation of SNS experiences enlightened the researcher about her own self-awareness and the underlying issues on her negative emotions occurred on the SNS uses, noticed nuances during their SNS use that she had not noticed before, and questioned her own SNS experience. Empowering users with the necessary information could enable them to make more informed decisions about their SNS use, which could foster positive emotions and mitigate the potential negative impacts associated with SNS use. The study revealed that users' motivations for using SNSs were driven by their information and social interaction needs. By providing users with a deeper understanding of how their data is collected, utilized, and protected, the user's self-awareness can be increased. This transparency might allow users to make conscious choices about their privacy settings and the content they engage with, thereby empowering them to actively shape their SNS experiences. Additionally, the study identified several issues that can negatively impact users' experiences on SNSs, including slow content reporting processes, hidden privacy settings, the prevalence of fake news and misinformation, and the abundance of repetitive content. With enhanced user self-awareness, individuals can better navigate these challenges and employ strategies to protect themselves, such as verifying information from multiple sources and adjusting their privacy settings accordingly. Furthermore, SNSs might help users develop a critical mindset and become more discerning consumers of information. This, in turn, can contribute to a healthier and more positive online environment. When users are empowered to make informed decisions, they are less likely to fall victim to misinformation, experience disappointment or dissatisfaction, and succumb to negative emotions associated with their SNS use.

4.2   Experience Maps

Based on the findings of the preliminary study, experience maps of the same three SNSs examined in the study of participant observation were created (see Appendices D, E, and F). These maps aim to visualize the end-to-end experience that depicts a regular SNS user's path, including their actions, touchpoints, thoughts, and emotions.

The experience maps also highlight different engagement types that users might have on these platforms since the experience maps include several user experiences by combining different SNS functions into one visualization. Within the context of Instagram, Twitter, and LinkedIn, four engagements types were identified:

- *Type 1, Information exchange* refers to the sharing of news, articles, and other forms of information on the platform, such as content sharing and retweeting on Twitter, and content sharing and profile building on LinkedIn. Additionally, reporting content or changing privacy settings on SNSs is considered to fall under the typology of information exchange. In this case, the user exchanges information about their preferences for privacy or reports of inappropriate content to the platform. It does not necessarily involve real social interactions or virtual or simulated relationships, but it is an exchange of information with the platform.

- *Type 2, Real social interactions* include conversing and engaging in conversation with other users, such as replying and mentioning on Twitter, and messaging and professional networking on LinkedIn.

- *Type 3, Virtual or Simulated relationships* refer to the creation and maintenance of virtual relationships on the platform, such as following and liking on Instagram, which may not necessarily lead to real-life interactions or relationships.

- *Type 4, Multi-sensorial experiences* involve the use of visual and auditory elements to create a rich and engaging experience for the user, such as sharing photos, videos, and live streams on Instagram and Twitter.

These engagement typologies provide insights into the different ways users engage with these platforms and the experiences they have while using them. According to these maps, the real social interactions occurring on these platforms are quite limited, and users mostly simulate real-life interactions with the functions of SNSs, such as liking the post, and following the new accounts as if they meet with new people in the real world. Therefore, most of the user actions are based on virtual or simulated relationships and multi-sensorial experiences. By understanding user behaviors and attitudes, SNS designers and developers could address user problems and enhance the user experience.

In brief, the visualization of the user's entire journey on Instagram, Twitter, and LinkedIn provided the researcher with a comprehensive understanding of generic user behaviors and attitudes, enabling further analysis and improvements in the design of these SNSs.

4.3 Analysis of Positive and Negative Sides of 3 SNSs

Another examination was the analysis of the positive and negative sides of three SNSs, which was generated according to the findings from the preliminary study, including the preliminary review and participant observation research (see Fig. 4.9). In the analysis, the opportunities that might bear areas for improvement and possible dangers that might threaten the user experience were examined.

Based on the findings, there are several positive aspects of Instagram, Twitter, and LinkedIn, such as pursuing interests and hobbies, connecting with other people or a larger audience, accessing information or news, and exploring business or career opportunities. These platforms offer a range of features and functionalities that cater to different user needs and provide diverse content types. However, there are also negative aspects to consider. On Instagram, users may encounter hidden or low visibility account settings, limited channels for real social relationships, and a prevalence of fake visuals or representations. Twitter has weak social connections with close circles, suggested content and ads that might interrupt the user experience, and the potential for distorted reality when relying solely on Twitter for news and information. LinkedIn may have unsuitable job recommendations and encounters with fake profiles or scams. Common negative aspects across these platforms include the slow process of reporting and insufficient feedback actions, as well as concerns about the authenticity of accounts. These issues can impact user satisfaction and trust in the platforms.

Opportunities for improvement include reaching a larger audience, diversifying the user base, enhancing user satisfaction, and empowering content creators and influencers. Additionally, Instagram could explore its potential in reaching different generations, Twitter might position itself as an official communication channel, and LinkedIn might focus on connecting associations and potential members more effectively. However, there are also potential dangers associated with these platforms. Instagram users may experience data distribution and trust issues, exposure of personal and intimate moments, and negative impacts on self-esteem and self-criticism. Twitter faces risks related to user data privacy, the spread of unreliable information, and exposure to echo chambers. LinkedIn's potential dangers include concerns about user data privacy and access to profiles by anyone.

Of particular importance in the analysis is the concept of passive user awareness and user emotional and mental balance. Passive user awareness refers to the lack of active awareness of one's feelings and thoughts during SNS use, where users are only aware of their actions when they engage or react to situations. An active awareness is

Positive Sides

Common points

- *Maintaining Social Relationships*
- *Connecting with Others* - User can connect people that they don't share a real relationship yet.

Instagram

- *Pursuing Interests and Hobbies*
- *Getting Information* - User can get information about celebrities and their lives.
- *Reaching Larger Audiences* - Instagram provides a huge stage to reach targets and become a social media influencer.
- *Business Opportunities* - User can create and promote their brands and services.

Twitter

- *Pursuing Interests and Hobbies*
- *Connecting with the World* - User can get news/information from the world.
- *Microblogging and Self-Expression* - User can share their own thoughts, opinions and experiences
- *Influential Hashtags and Retweets* - Hashtags and retweets are powerful features to respond and spread their thoughts.
- *Reaching Larger Audiences* - Instagram provides a huge stage to reach targets and become a social media influencer.
- *Groups and Communities* - User can participate groups/communities that they have a link or interest.

LinkedIn

- *Career-centered Networks* - User can find new connections in order to build career-centered networks
- *Getting Professional Related News/Trends/Updates*
- *Pursuing Career Opportunities*
- *Recruiting and Gathering New Members for Associations*
- *Groups, Pages and Associations* - User can participate groups/pages/associations that they have a link or interest.

Negative Sides

Common points

- *Slow Process of Reporting* - Getting a result from reporting a content takes a lot of time, and it is not informative in terms of providing how the system works. Also, the way of presentation of the reported content to other users allows spreading the misinformation or violent content.
- *Insufficient Feedback Actions* - Although user gives feedback about the performance of the site, it doesn't work efficiently to improve user experience.
- *Authenticity of the Accounts* - User encounters with fake profiles, or gets scammed or phished by fake ads, job opportunities.

Instagram

- *Hidden or Low Visibility of Account Settings* - User doesn't know some settings that can change and modify the content and user feed.
- *Limited Channels for Social Relationships and Weak Social Connections* - User's social connections mostly depends quick actions, such as liking, reacting, even in private and group chats. Also, apart from direct messaging, building or sustaining real social relationships are limited.
- *Fake Visuals or Representations* - User generally encounters with the good moments of the people they follow. Even more, they also share their good moments.
- *Low visibility of contents* - Users can miss the contents from content creators and influencers that they follow.

Twitter

- *Weak Social Connection* - Real social connection with close circle (friends, acquaintance etc.) through Twitter is weak.
- *Suggested Content/Ads* - The user experience could be interrupted by integration of suggested tweets in user feed. So, user might miss the contents from their followings.
- *ML algorithms* - Twitter ML algorithms miss punctuation marks and symbols on tweets.
- *Distorted Reality* - The user who uses Twitter as a news/information source to check the reality may distort the user's perception of reality.

LinkedIn

- *Unsuitable Suggestions* - The job recommendations of LinkedIn doesn't match with the user profile data.

analysis of 3 SNSs

Opportunities

Common points

- *User Satisfaction* - Increasing user satisfaction could be taken several actions (e.g. visibility of settings, ML algorithms explanation, fake accounts and image thefts for IG, reducing abuse/ harassment, combatting fake news/misinformation and protecting the integrity of election-related conversations for Twitter, and reducing fake job opportunities and ads for LinkedIn).
- *The Power of Influencers* - In these social networks, influencers have a huge influential impact towards users' decision making behaviors.
- *Content Creators* - Creators are more willing to learn how social networks work, what are recent updates on the algorithms and features.

Instagram

- *Great Potential for Reaching Larger Audience*
- *More Potential in User Diversification* - Instagram is being used by most of the people around the world.
- *Different Types of Contents* - IG offers different types of contents to be consumed (video, image, text, live broadcast)

Twitter

- *Official Communication Channel* - Twitter transforms into an official communication channel for news/information.
- *Enticing Different Generations* - Twitter is a microblogging platform (textual-based), it could be more appealing for Gen-Z by providing features like TikTok.

LinkedIn

- *Unique Connection of Associations and Potential Members* - LinkedIn connects more employers with potential candidates.
- *Recruiters and candidates* - They have different user needs and experience.

Possible Dangers

Common points

- *Passive User Awareness* - User is not aware what they are feeling during the use. They are only aware of their actions when they engage or react to situations. (*An active awareness is one that is not solely engaged in the process of reacting to situations. It is, in a sense, a state of mind one develops whereby they pay attention to what they are feeling and thinking as they go about their lives.)
- *Addictive User Behaviors* - SNS use could lead user to get addicted and wasting their time as they get lost in consuming content.
- *User Experience* - User experience is mostly dominated by negative emotions.
- *User Emotional and Mental Balance* - All the problematic social network site uses could bring into emotional mental imbalance. User dissatisfaction increases.
- *User Privacy Concern* - The user thinks invaded by the suggestions and sponsored contents. The time and the quality of the engagements with the sites are decreasing. (skipping the stories quickly, scrolling on the feed)

Instagram

- *Data Distribution and Trust* - Ads related with past research activities outside of social networks are frequently shown to user, which damages the trust between user and Instagram.
- *Exposure of Personal and Intimate Moments* - Sharing personal or intimate moments of life (with lots of people)
- *Damaging User Self-esteem* - User could question themselves and the relevance of Instagram to the society, and user gets used to wait for approval from others.
- *Increasing User Self-criticism* - User' concerns concerning about body image and self-representation could increased.

Twitter

- *User Data Privacy* - Twitter can breach and leak users' personal information.
- *Unreliable Information* - User is more open to encountering fake and misinformation.
- *Open to Manipulation and Being Exposed to Echo Chamber* - User sees similar accounts and opinions, they could perceive the presented claim as an accepted perspective by many people.

LinkedIn

- *User Data Privacy* - Anyone can see anyone's profile in LinkedIn.

Figure 4.9 Analysis of Positive and Negative Sides of 3 SNSs

one that is not solely engaged in the process of reacting to situations. It is, in a sense, a state of mind one develops whereby they pay attention to what they are feeling and thinking as they go about their lives.

To promote user emotional and mental balance, it is crucial for SNSs to prioritize user well-being and address the negative aspects identified. This could involve implementing features that encourage active self-reflection, promoting healthy engagement habits, and providing resources or support for users experiencing emotional or mental challenges. Focusing on enhancing emotional well-being and empowering users could create a more positive and fulfilling user experience, fostering a healthier relationship between users and the digital environments they engage with.

4.4 Online Survey Results

The online survey aimed to examine and obtain insights into SNS usage, SNS experiences, and the self-awareness of individuals about their use. Based on the results of the online survey, which included 64 participants of different ages and genders, it was found that the majority of participants (73.4%) were female, while 32.8% were male. Regarding age range, the largest group of respondents was between 25-34 years old, followed by those between 35-44 and 45-54 years old (see Fig. 4.10).
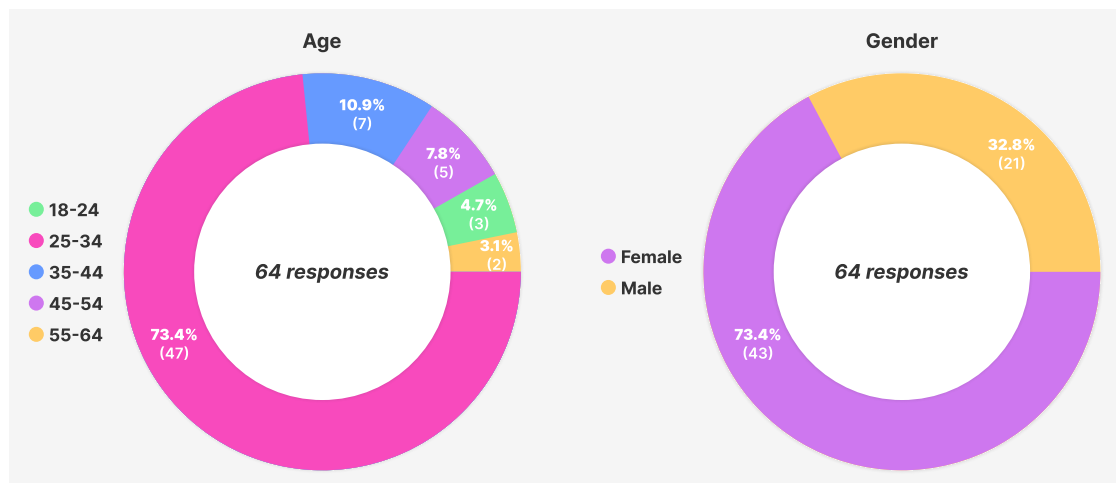
Figure 4.10 Demographics of participants

In the second section of the survey on the SNS experience of individuals, participants answered questions related to their SNS use, such as the negative consequences that they experienced, the emotions they usually feel while using their SNS accounts, and their purposes for using these sites. Interestingly, only one participant stated that they did not have any SNS account due to concerns about sharing their life online. On the contrary, the remaining participants all had at least one SNS account, with Instagram,

LinkedIn, and Facebook, being the top three platforms in that order. Instagram was the most preferred SNS with 61 participants having an account, while it was followed by LinkedIn with 52 participants and Facebook with 50 participants (see Fig. 4.11). The survey revealed that participants spend varying amounts of time on SNSs, and some have experienced negative impacts, including mental problems with 45.3% (28), and physical problems with 17.2% (11) during their use. Additionally, 43.8% (28) of participants reported that their quality of life decreases as a result of SNS use, and they also think that SNS use weakens their social relationships, and 17.2% (11) of participants have experienced online harassment while using their SNS account.

Don't have any account	1 (1.6%)
Facebook	50 (78.1%)
Instagram	61 (95.3%)
Twitter	40 (62.5%)
TikTok	18 (28.1%)
LinkedIn	52 (81.3%)
Snapchat	14 (21.9%)
Tinder	9 (14.1%)
BeReal	12 (18.8%)
ResearchGate	14 (21.9%)
Bumble	1 (1.6%)
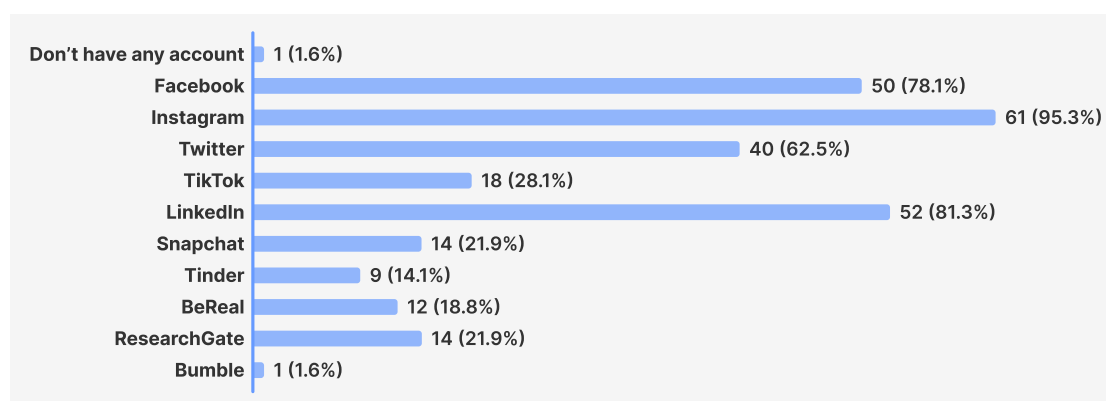
Figure 4.11 SNSs that participants have an account with

In terms of SNS usage, Instagram was the most used SNS with 73.4%, followed by Twitter (14.1%) and LinkedIn (4.7%) (see Fig. 4.12). On the other hand, participants' second-most used SNS was Twitter with 26.98%, and Instagram was once again the more popular SNS among respondents with 17.46%, followed by Facebook with 14.28%. Participants' primary purposes for using their popular SNSs were getting news and information from people and events, getting an enjoyable time, killing time, and maintaining existing social relationships by communicating with their friends and family members. Similarly, the respondents of the survey mostly perceive SNSs as useful to connect with friends, family, or colleagues, get news or information, and find out new topics, interests, or suggestions. Besides, participants less use platforms for shopping. Apart from the usefulness of the platforms, the online survey showed that even though participants feel happy while using their SNS, participants can experience the emotions of sadness, dissatisfaction, and surprise as well.

This online survey also indicated several greatest concerns of SNS users during their SNS experience, which could be gathered under six themes: user privacy, reliability of the information, content quality, unintended or poor social interactions, the well-being of SNS users, and lack of lawful actions. Among these themes, the most emphasized concern by participants was the privacy concern of their personal data and the privacy of the content they share on their profiles. User privacy also involves the concerns of identity theft, being hacked, and disclosed of personal data to the public. In addition to user privacy concerns, the respondents were concerned about
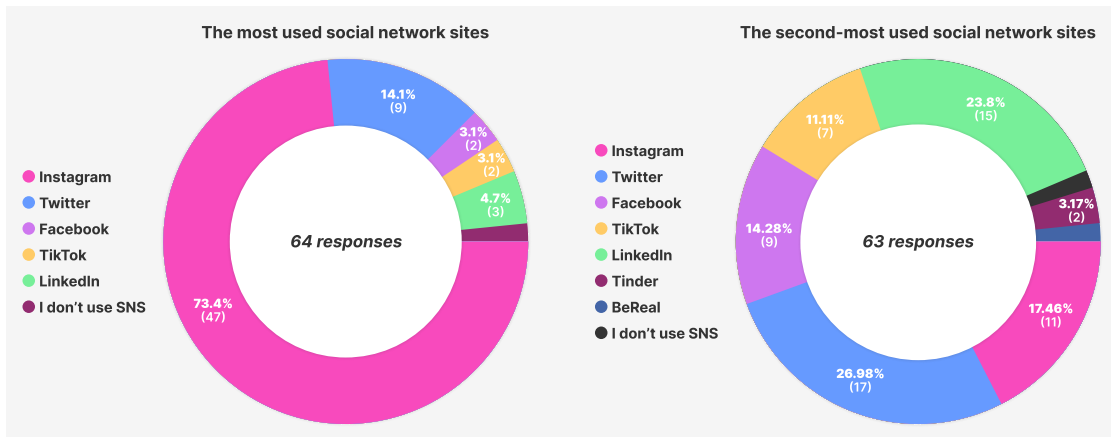
Figure 4.12 SNS usage of participants

the reliability of the information, which refers to concerns about seeing fake information on their feed or being stuck inside their personal bubble and not being able to see different perspectives, one of the respondents said that it is hard to understand whether the resource of the information is reliable or not. SNS users also stated that they worried about the quality of content, which is related to seeing inappropriate and irrelevant content, especially ads that are not interesting for the user, or receiving undesired comments or suggestions. Besides, unintended or poor social interactions are another user concern when using their SNS, and some of the participants declared that they worry about getting bullied or wasting their time on invaluable interactions; even more one respondent said that they think using SNS decreases real social interactions with friends and family. Further concerns of the participants of the online survey were concerns about their well-being and lack of lawful actions on SNS. The well-being concern consists of low or imbalanced mental and emotional well-being since they think the excessive usage of SNS can make them addicted to SNS and disrupt user personal development. Moreover, they also think that content or information shared on SNS could influence individuals' moods negatively, and users could become emotionally triggered. For example, one participant believed that they have mentally been affected when they see sad content; due to that, they could feel depressed and down for several weeks. Similarly, another participant said that some ads have a negative impact on participants' emotional well-being, and they feel more sensitive. Lastly, according to the responses of the participants, SNSs do not provide solid lawful actions towards social media threats and violations. What's more, the second section of the online survey drew forth that the survey participants consider that user privacy and safety, the interface of SNS, and the reliability of information shared on the platform are some critical dimensions that affect user SNS experience, regardless of the effect's positivity or negativity. Additionally, functions and features of SNS and the display of ads and other suggested

85

contents are the secondary factors affecting the SNS experience of users based on the participants' responses since the way of displaying functions or features of the social network platforms can shape the user experience.

In the last part, the survey included questions about the self-awareness of individuals in relation to their SNS use. According to survey results, more than half of the respondents are of the opinion that they are quite aware of the functions that are available on their SNS accounts (see Fig. 4.13). However, this situation changes regarding their awareness of the ML systems of SNS they use. Participants' self-awareness of ML algorithms, including their purposes and functionalities, is less (see Fig. 4.14). Moreover, survey results showed that 56 of 64 participants considered that gaining self-awareness about their SNS use could have a positive influence, and their SNS experience eventually could improve (see Fig. 4.15).
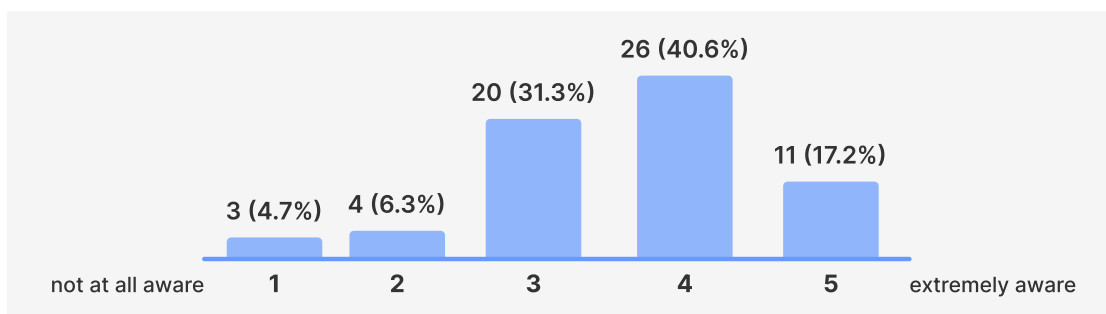
Figure 4.13 Participants' self-awareness of the functions available in the SNS interface
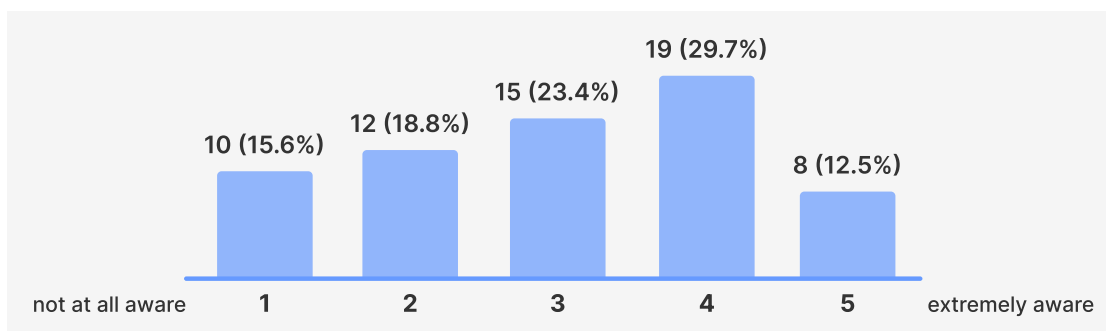
Figure 4.14 Participants' self-awareness of ML algorithms, including their purposes and functionalities

Apart from these, based on the survey results, there are several user strategies that are in use while using SNS. The first strategy is for the verification of information resources, in which participants check comments or discussions under the shared posts, or check and validate the shared information with other reliable sources; even more, users can just directly avoid unfamiliar sources on their feed. Another set of strategies employed by SNS users aims for privacy and data protection, which includes changing profile settings and user preferences, using external software, such as 2-factor authentication tools and antivirus programs, building strong privacy
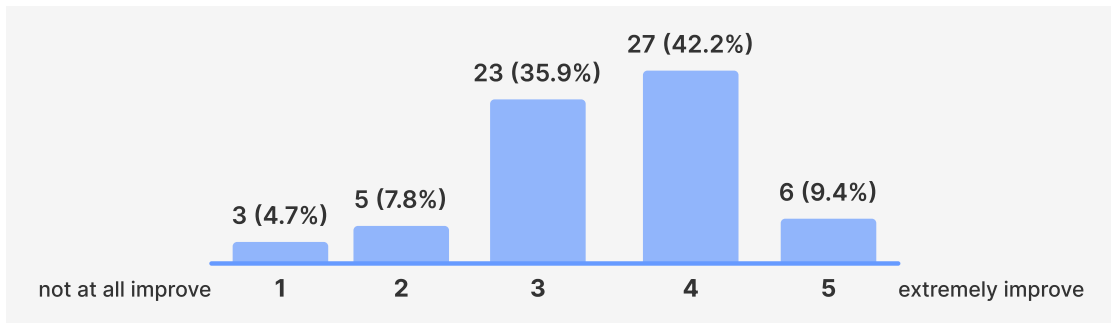
Figure 4.15 "Gaining self-awareness on their SNS use can improve user experience"

settings, not posting personal information or covering that information while sharing and reporting and blocking spam contents or users. The last strategy is, even though it is not quite common, trying to play with the SNS algorithms, in that case, users strive for changing the algorithm by following new accounts or watching new content that they would not so that they could view new topics and suggestions or they could stop seeing uninteresting contents.

Finally, the survey results also revealed that respondents consider sharing their strategies or taking new suggestions to increase their own control over the platforms and elevate their SNS experience. The most common suggestion is related to the time management of SNS use, in which individuals put a time limit when they experience emotional content, and the latter one is recommending accounts, or exchanging ideas about hidden functions, such as the one that enables stopping ads or contents suggestions, or the option that users can choose 'I don't like this content!' when the content is bothering them so that the SNS system will not show similar contents again.

4.4.1   Online Survey Summary

In general, this online survey conducted on SNS usage, experiences, and self-awareness of individuals yielded insightful findings, and the survey findings shed light on various aspects of SNS usage, and behaviors and attitudes of individuals. Respondents highlighted the importance of user privacy, reliable information, and content quality, and they also underscored the need for addressing unintended negative consequences and promoting user well-being.   Empowering user self-awareness and improving user experience emerged as the key recommendations from the survey respondents.   The survey findings also enabled the researcher to evaluate and validate the findings of the participant observation study.

4.5 Benchmarking Research Results

The benchmarking research conducted in this study aimed to explore and analyze various benchmarks and resources related to different aspects of SNSs. The research focused on three main areas: business and marketing-centered benchmarks, SNS design-centered benchmarks, and ethical SNS use-centered benchmarks (see Fig. 4.16).
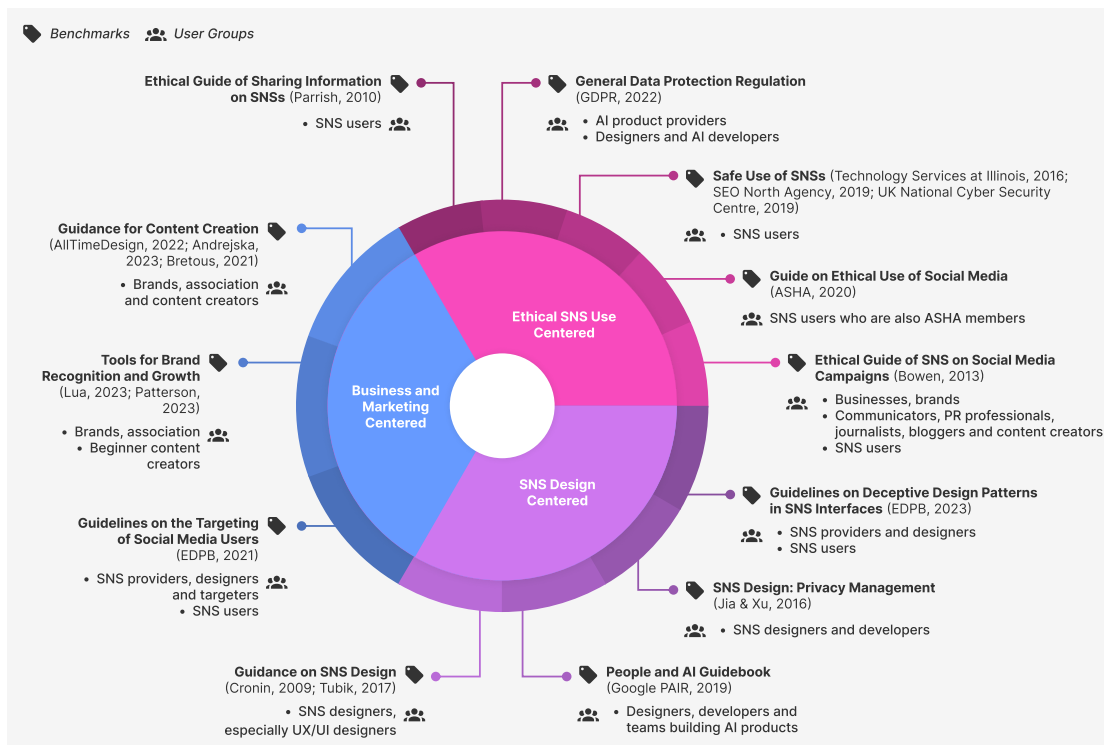
Figure 4.16 Categorization of benchmarking results

Throughout the study, a range of websites, blog articles, and tools were identified. Additionally, benchmarks related to SNS design guides, guidelines, and toolkits were examined to understand best practices in designing user-friendly and engaging SNS interfaces. Furthermore, the research delved into available resources pertaining to ethical SNS use, including guidelines and principles regulated by governmental organizations, independent associations, and institutions. The following section will provide an in-depth evaluation of each focus area of benchmarks.

4.5.1 Business and Marketing-Centered Benchmarks

During the benchmarking research, several websites, blog articles, and tools that share and explain strategies and tips for brands to create powerful content that matches their target audience and build brand recognition were identified (see Fig. 4.17). First of all, as a part of content creation, there are many online resources that provide guidance for brands and associations looking to establish a strong social

media presence through effective design. In addition to brands and associations, content creators and social media influencers might benefit from these guides. The guides found from different platforms, such as HubSpot, Medium, and All Time Design consist of information on the consideration for social media post design, suggestions for designing social media posts by providing additional tools for content design templates (Alltimedesign, 2022; Andrejska, 2023; Bretous, 2021). The strong aspects of the content creation guides are providing explanatory information with the help of videos, such as tutorials that explain the tools for content design, and also serving additional sources for design templates for content creation. On the other hand, the weakness of these guides is that even though these sources are credible, they are not considered regulations or standards to be followed. Moreover, the dimensions of guides are not detailed; in fact, despite having brands and persons who seek a business-related goal on SNSs as a user group, the information shared through these guides is on the surface.

The second business and marketing-centered benchmarking area focus on suggestions and guides for brand recognition and growth. Similar to content creation, it also aims to address the issues of brands and associations as well as SNS users who are beginners in marketing. The available guides mainly suggest tips and strategies that could be helpful in increasing brand performance, and provide guidance for novice SNS users explaining supportive tools for marketing strategies, which could result in brands and companies could align their organizational goals, increasing their digital engagements, and attracting new audiences. The guide of SproutSocial for beginners includes several tooltips on social media analytics and management, and provides SNS-specific marketing strategies to beginners, whereas the guide by Buffer contains a list and description of social media management tools for businesses on different levels and additional resources for the tools (Lua, 2023; Patterson, 2023). Although both sources gather a wide variety of marketing tools in one place and provide SNS-specific tips or business-level focused marketing suggestions, they show the same weaknesses as content creation guides.

Besides the common business and marketing guides and suggestions on SNS use, the guidelines initiated by European Data Protection Board (EDPB), which is a European Union independent body, offer guidance on the subject of the targeting of social media users by considering the provisions of the GDPR. The guideline is primarily designed to elucidate the responsibilities of different actors who might be affiliated with different roles in the process of targetings, such as social media providers, their users, and targeters (European Data Protection Board, 2021). In order to make a clarification on the responsibilities, the guidelines also take advantage of the basis of practical examples. As well as explaining the different roles and responsibilities between various actors, the guidelines also demonstrate the potential risks to the rights and freedoms that individuals may be exposed to due to the processing of personal data, and provide analysis of different user targeting mechanisms with

What is for? / Measures	Guidance and Tools for Content Creation	Tools for Brand Recognition and Growth	Guidelines on the Targeting of Social Media Users
Artifact	• Website article on HubSpot • Blog article on Medium • Website article on All Time Design	• Website article and tools on SproutSocial • Website article and tools on Buffer	• Guidelines by EDPB
User Group	• Brands/Associations • Content creators	• Brands/Associations • Beginners content creators	• SNS providers, designers and targeters • SNS users
Scope	• Provide a guidance for brands looking to establish a strong social media presence through effective design	• Suggest tips and strategies to increase brand performance, and provide a guidance for beginners explaining supportive tools	• Provide guidance on the targeting of social media users by considering the provisions of the GDPR • Inform social media stakeholders about targeting mechanisms
Expected Outcomes	• Strong social media presence for their brand • Create and post effective content	• Aligned organization goals • Increase digital engagement • Attract new audiences	• Identify the responsibilities of different actors who might be affiliated with different roles to the process of targeting • Demonstration of the potential risks to the rights and freedoms of users
Design Features and Dimensions	• Considerations for social media post design • Tips for designing social media posts • Design templates for content creation	• List of social media managements tools • Explanatory information on what supportive marketing tools are and how they can be used • List of additional resources based on a specific SNS	• Roles and responsibilities of each actors might involve in the targeting process • Analysis of targeting mechanisms • Transparency and right of access • Data protection impact assessments (DPIA) • Special categories of data • Joint controllership and responsibility
Strengths	• Providing explanatory tutorial videos • Additional sources for design templates for content creation	• Including a wide variety of marketing tools • Providing SNS specific tips and strategies • Differentiating suggestions focusing on different business levels	• Limiting the focus area of guideline with the targeting of social media users • Providing specific examples in relation to the roles and targeting mechanisms
Weaknesses	• These publications are relatively credible but they cannot be considered as regulation or standards to be followed. • Dimensions are not detailed. • They lacks suggestions for issues defined through participant observation.	• Containing information are quite generic. • These publications are credible but they cannot be considered as regulation or standards to be followed.	• It embodies the whole concept of social media, not only the concept of SNSs.

Figure 4.17 Business and marketing-centered benchmarks

regard to the requirements of data protection, such as transparency and lawfulness. In spite of that the EDPB does not propose an all-inclusive list of the potential risks to the rights and freedoms of users, it, even then, indicates particular types of dangers and exemplifies them to illustrate how these dangers could be noticeable. Besides, although the guidelines embody the whole social media concept, not only the concept of SNS, it is still important to note that it limits the focus area of the guideline to targeting of social media users in order to aim at a specific user group. It also adds dimension to the guide by providing specific examples of identified roles and existing targeting mechanisms.

4.5.2 SNS Design-Centered Benchmarks

The second group defined in the benchmarking study contains benchmarks related to guides, guidelines, and toolkits about the design of SNSs (see Fig. 4.18). Before assessing the well-structured guidelines and toolkits, there are accessible resources including popular suggestions and tips for SNS designers, especially for UX and UI designers. In these sources, it is not provided proper guidance for better-resolving user needs and problems, developing intuitive user interfaces, and enhancing the usability of SNS features. Nonetheless, the sources contain several suggestions for UX and UI designers regarding the process of SNS design, and some of the highlights for designers are as follows (Cronin, 2009; Tubik, 2017):

- Easy and simple registration to the platform

- Clear and fast functioning features for generating and sharing content

- Profile setting by taking into account ethical principles, such as data privacy

- Considering different ways of communication and social engagements

- Delivering the characteristics of a platform with a simple interface design

Additionally, as a more narrowed scope in SNS design, privacy management on SNSs is also another subject that requires the attention of SNS designers and developers. A conference publication, titled *Autonomous and Interdependent: Collaborative Privacy Management on Social Network Sites* (Jia & Xu, 2016) profounds a guide for SNS designers and developers illustrating suggestions and considerations on how designers and developers can meet user needs and improve user's SNS experience with achievable privacy goals. The dimensions of guidelines might be outlined with three aspects: *ownership management*, *access management*, and *extension management*. By developing these design guidelines, SNS designers and developers could understand and give support to users' needs to secure their online privacy, not only themselves but also their social connections alongside suggestions on tools and mechanisms for privacy management in the guideline. Furthermore, the guidelines also aim to enhance users' awareness of the collective privacy boundary. However, the inadequacy of the guidelines is that since the term privacy is quite dependent on the context and social environment, the implications of the guidelines' dimensions could require adaptation by SNS designers or developers according to a particular social context or situation.

On the other hand, the design guidelines and toolkits from more prestigious resources that are provided by technology companies, or independent associations, such as Google's multidisciplinary team called PAIR (People + AI Research), are also available to analyze and illustrate the potential risks in SNS design. In this respect, the first benchmark is the guidelines and a toolkit developed by Google PAIR, which is called *People and AI Guidebook*, and it was initially published in 2019 (Google PAIR, 2019). Google PAIR, conducts examinations and studies in order to improve and

What is for?	Guidance on SNS Design	Privacy Management on SNS Design	People and AI Guidebook	Guidelines on Deceptive Design Patterns in SNS Interfaces
Measures				
Artifact	• Website article on Medium • Website article on Smashing Magazine	• Design guideline from a conference paper	• Guidelines and toolkits by Google PAIR	• Guidelines by EDPB
User Group	• SNS designers, especially UX/ UI designers	• SNS designers and developers	• Designers, developers and teams building AI products	• SNS providers and designers • SNS users
Scope	• Provide a general understanding on designing better user experience • Demonstrate several suggestions about what UX/UI designers might consider while creating SNS experience or SNS interfaces	• Illustrate suggestions on how user needs could be met and user's SNS experience could be improved with achievable privacy goals	• Provide a guideline and toolkit that can be employed throughout the development flow of the AI product	• Present a collection of practical recommendations on how to detect and prevent deceptive design patterns in SNS interfaces • Providing suggestions to users on how they can identify and avoid the deceptive design patterns
Expected Outcomes	• Address the user needs and problems • Develop intuitive user interfaces • Enhance the usability of SNS features	• Understanding and give support to users' needs to secure their online privacy, not only themselves, but also their social connections • Enhancement in users' awareness of the collective privacy boundary	• Evaluating the AI system • Defining the areas that need improvements • Reduce ethical problems caused by AI • Increase user experience	• Identification and assessments of deceptive design patterns • Methods of how to prevent these patterns in the interface • Increase in user awareness • Knowledgeable users on deceptive design patterns
Design Features and Dimensions	• Overall insights about social media, and user experience • Basic suggestions on how to design SNS experience	• Covering dimensions of privacy (Ownership, access and extension management) • Suggestions on tools and mechanisms for privacy management	• 6 chapters (User needs and defining success, Data collection and evaluation, Mental models, Explainability and trust, Feedback and control, and Errors and graceful failure) • Exercises in the toolkit	• Deceptive design patterns (Overloading, Skipping, Stirring, Obstructing, Fickle, and Left in the Dark) • Relevant GDPR provisions for deceptive design pattern evaluation • Examples of deceptive design patterns in use cases of the life-cycle of a SNS account • Recommendations on best practices for each use case
Strengths	• Containing several suggestions for designers what they can pay attention while designing SNS experience or a SNS interface	• Aiming to improve user awareness of the collective privacy boundary.	• Credible sources • Combination of detailed descriptions and supportive exercises	• Presenting practical recommendations
Weaknesses	• They are just suggestions that draw general frame of the SNS design, not guidelines or toolkits that explain or evaluate the dimensions of SNS design.	• Might require adaptation of guideline dimensions by designers or developers according to a particular social context or situation	• The context of guidelines are related to general making use of AI in a system, so it doesn't contain specialized design dimensions for SNS context.	• Deceptive design patterns, examples and best practices listed do not have far-reaching details.

Figure 4.18 SNS design-centered benchmarks

present the ethical guidelines of AI. The People and AI Guidebook is made of six chapters providing comprehensive guidance throughout the development flow of the AI product: user needs and defining success, data collection and evaluation, mental models, explainability and trust, feedback and control, and errors and graceful failure. By doing so, the guidelines are beneficial to teams who work on building human-centered AI solutions. Therefore, in addition to the six chapters of the guidance containing informative explanations of what they should consider while developing an AI system in each chapter, it also includes an in-depth toolkit that is equipped with a number of exercises that could be helpful while evaluating the AI system, and defining the areas that need improvements or design iterations. Even though the guidelines meticulously embody information on how AI systems can be developed, this benchmark is not providing specialized design dimensions and principles for the context of SNSs; in fact, it gives information for the general use of AI in a system.

Apart from the guidelines, further guidance on SNS design is the guidelines on deceptive design patterns in social media interfaces of EDPB. Within these guidelines, a collection of practical recommendations to social media providers and designers on how they could analyze and prevent deceptive design patterns in the interfaces of social media platforms that contravene the principles of GDPR (European Data Protection Board, 2023). In addition to that, the guidelines are also valuable and applicable for users of SNSs since it offers suggestions on how users can identify and avoid deceptive design patterns as well. The guidelines consist of the deceptive design patterns in six separate groups;

- *Overloading* refers to the situations where the users are faced with an immense amount of requests, information, options, or possibilities to encourage users to share more data or to give inadvertent allowance for personal data processing against the data subject's expectations.

- *Skipping* is related to the design of the platform interface or user journey in the sense that users forget or ignore all or some aspects of data protection.

- *Stirring* is influencing the choices users would make by enticing their emotions or using visual nudges.

- *Obstructing* represents interrupting or preventing users in the process of staying informed or managing their data by complicating or precluding the action.

- *Fickle* refers to the creation of inexplicit and inconsistent interface design, which makes it difficult for the user navigation over the control of various data protection tools and comprehend the purpose of the data processing.

- *Left in the dark* refers to that an interface designed to hide information or data protection control tools or make users distrustful of what control they have over how their data is processed and the exercise of their rights.

Last but not least, the guidelines involve the relevant GDPR provisions for deceptive design pattern evaluation and plenty of examples of deceptive design patterns in the interfaces of social media platforms in use cases of the life-cycle of an SNS account and recommend foremost and outstanding practices for each use case. Consequently, the guidelines offer practical recommendations for different actors in social media, but deceptive design patterns, examples, and best practices listed do not have far-reaching details.

4.5.3   Ethical SNS Use-Centered Benchmarks

The last category of benchmarking research constitutes multiple available product interventions for ethical SNS use, in which the ethical guidelines and ethical principles are regulated and explained by governmental organizations, independent associations, and institutions (see Fig. 4.19).

The General Data Protection Regulation (GDPR) is one of the major guidelines made by the European Parliament and Council of the European Union, which regulates the strictest privacy and security law in the world. Even further, despite being designed and accepted by the European Union, it enforces the execution of the laws by companies and institutions around the world in case the target user group constitutes people from the European Union or utilizes their data. Under this regulation, the laws are explained under seven principles (General Data Protection Regulation, 2022);

- *Lawfulness, fairness, and transparency:* Data processing must be lawful, fair, and transparent to the data subject.

- *Purpose limitation:* Data must be processed with lawful purposes that are explicitly designated to the data subject when data is collected.

- *Data minimization:* Only data that is strictly necessary for the stated purposes should be collected and processed.

- *Accuracy:* Personal data must be kept accurate and current.

- *Storage limitation:* PII should only be retained for as long as it is necessary for the stated purpose.

- *Integrity and confidentiality:* Data processing must be executed in a way that guarantees proper security, integrity, and confidentiality, such as making use of data encryption.

- *Accountability:* The responsibility of the data controller is to indicate GDPR compliance with all these principles.

Notwithstanding the GDPR is an important source containing in-depth explanations of diverse possible situations that could lead to privacy violations and data breaches, the regulation, similar to the People and AI Guidebook, does not put the ethical use of SNSs in the center, but it could be still implemented to the process of SNS development.

As dissimilar accessible guidelines on ethical SNS use, the research outcome of Shannon Bowen was determined during benchmarking study. Her research named *Using Classic Social Media Cases to Distill Ethical Guidelines for Digital Engagement* seeks to identify and extract the basis of ethical guidelines for digital engagements in social media (Bowen, 2013). The guidelines consist of 15 different dimensions that provide guidance for businesses, which are either small or large scale, and aim to build better public relations and engagements, on what considerations they need to pay attention to while conducting a message or social media campaign to the public. By creating these guidelines, she also aimed to respond to the ethical use of social media across different cultures, social media platforms, and particular circumstances. In addition to the advantages of the guidelines for companies and brands, the guidelines indirectly target social media users. With these several ethical directives, the awareness of users on social media platforms could be raised about social media campaign ethics, which could yield an increase in active audiences on social media. As a result of these aspects, the dimensions of ethical guidelines range from transparency, and fairness to the analysis of rationality, to building good engagements. Although such a variety of guidelines outline the general situation for building public relations and conveying a message to audiences in social media, the guide is not detailed and lacks further explanatory information or examples.

Existing products on the ethical use of SNS are not limited to the regulation of privacy and other basic ethical principles for running social media campaigns but there is an available guide focused on the ethics of sharing information on SNSs. This guide is also derived from a publication by Parrish, 2010, whose title of the publication is *PAPA knows best: Principles for the ethical sharing of information on social networking sites*, and the guide defines four ethical principles in order to achieve responsibly sharing information on SNSs;

- *Privacy*, which is essential when sharing information on SNSs, should be taken into account not only for the privacy of the data subject's personal information but also for the privacy of the information of other individuals who may have a link to the information shared.

- *Accuracy* is an ethical principle referring to the responsibility of the person who shares information to confirm the accuracy of the information before posting it.

- *Property* means that an SNS user should not share information about themselves that they think they may want to withdraw at a later date. In addition, information that is the product of another person's mind should not be posted on SNSs without obtaining authorization from that person.

- *Access* refers to an SNS user who is responsible for ascertaining the authenticity of a person or other actors before allowing the person or other actors to access the shared information.

Since the guide just gives information on what users need to consider while sharing information on SNSs, the scope of the guide quite lacks a diversity of potential risks and challenges that SNS users may face.

Besides three different benchmarks, several guidance and advisory tutorial videos for SNS users on data privacy and safety management on SNSs from governmental organizations and departments of universities are available. These safe use guides of SNSs and the tips on the protection of data privacy on SNS use are designed with the purpose of providing general information on how SNS users can manage the security and privacy settings on their SNS accounts; as a result of these guides, it might be expected to enlighten users about possible dangers and risks on SNSs and give information to users on how they could change their privacy settings and use their account safely (SEO North Agency, 2019; Technology Services at Illinois, 2016; UK National Cyber Security Centre, 2019). In one of these sources, a list of resources for privacy settings based on a specific SNS and suggestions on the safe use of SNSs are covered; on the other hand, advisory videos on YouTube give basic information and safety tips. The major weakness of these guides and tutorials is that the information shared with users is limited and shallow.

Similarly, there are many associations and websites that publish guides basically informing their users about the ethical use of social media, including privacy violations, profile settings, connecting with others respectfully, or maintaining appropriate boundaries among the relationships. An example of one of them is the guide published by an association called American Speech-Language-Hearing Association (ASHA) on its website. The guidance offers the members of ASHA considerations on the ethical use of social media with the purpose of guiding users on how they might responsibly use social media platforms with regard to ethical principles (ASHA, 2020). Despite the fact that the scope of the guidance is the use of social media and the possible ethical challenges and concerns that users might face during the use, the guidance is structured with quite limited information on ethics and examples of ethical violations. Thus, the guidance only manifests three ethical topics: breaching confidentiality, avoiding misrepresentation in the promotion of services and products, listing credentials, and avoiding remarks that may constitute defamation. Therefore, such guides are not inclusive of the user's complete social media experience and do not fully address the issues users experience.

What is for? / Measures	GDPR	Ethical Guide of SNS on Social Media Campaigns	Ethical Guide of Sharing Information on SNSs	Data Privacy and Safety on SNSs	Guide of ASHA on Ethical Use of Social Media
Artifact	• GDPR by European Parliament and Council of the European Union	• Guidelines from a publication	• Guidelines from a publication	• Guidance by UK National Cyber Security Centre • Advisory videos by University of Illinois IT department, and SEO North Agency	• Guidance by ASHA
User Group	• AI product providers • Designers and AI developers	• Businesses, brands who seek to build public relations • Other actors playing role in public relations (Communicators, PR professionals, journalists, bloggers, and content creators • Indirectly SNS users	• SNS users	• SNS users	• SNS users who are also ASHA members
Scope	• Provide an extensive range of regulations on privacy and security laws	• Identify ethical guidelines for digital engagements on social media • Guide businesses on what considerations they need to pay attention while conducting a message or campaign	• Offer basic principles of ethical information sharing • Inform SNS users about what the essential ethical guidelines are when sharing information on SNSs	• Provide general information on how SNS users can manage the security and privacy settings on their SNS accounts	• Provide information and guidance on several ethical violations that users might experience
Expected Outcomes	• Regulating privacy and security laws in the world • Protecting user data and privacy • Avoiding and punishing privacy violations	• Increase in digital engagements • Trustworthy and strong public relations • Indirectly, rising an awareness on users about social media campaign ethics • More active audiences on social media	• Provide assisting SNS users in the qualities of information • Principles for the ethical sharing of information on social networking sites	• Enlightening users about possible dangers on SNSs • Informing users on how to protect their privacy	• Using common sense when using social media, avoiding personal attacks on others
Design Features and Dimensions	• 7 law principles (Lawfulness, fairness and transparency, Purpose limitation, Data minimization, Accuracy, Storage limitation, Integrity and confidentiality, and Accountability) • Detailed descriptions	• 15 ethical dimensions for using social media while maintaining a social media campaign • Extensive guidelines from fairness and transparency to reliability of message, to building good engagements	• Basic principles of ethical information sharing: Privacy, Accuracy, Property, and Access	• List of resources based on a specific SNS • Basic suggestions on how to protect privacy and use SNS • Safety tips	• Breaching confidentiality • Avoiding misrepresentation in the promotion of services and products, and the listing of credentials • Avoiding remarks that may constitute defamation
Strengths	• Being imposed obligations by worldwide • Containing in-depth explanations of diverse possible situations could occur	• Outline of the general situation for building public relations and conveying a message to audiences in social media	• As it gives information on what users need to consider while sharing information on SNSs, the context is clear.	• Conveying the information with the help of visual content	• It could be supportive source for the members of the association to gain an understanding on the ethical use of social media platforms
Weaknesses	• It is not specific to the context of SNSs. • It could require adaptation to the process of SNS development.	• The guide is not detailed and lacks further explanatory information or examples.	• The scope of the guide quite lacks diversity of potential risks and challenges that SNS users may face.	• They contain limited and basic information.	• It contains quite limited information on ethics and the examples of ethical violations.

Figure 4.19 Ethical SNS use-centered benchmarks

4.5.4 Benchmarking Research Summary

The benchmarking study has revealed some important findings regarding a variety of available guidelines and toolkits from three different focus areas (see Fig. 4.20). However, while 12 distinctive guides are identified throughout the study, one key finding is that most of the existing guidelines primarily address popular issues associated with social media, rather than specifically focusing on the essence of the challenges that users face while using SNSs. This could actually be caused by the misconception of social media and SNS and using the terms interchangeably. In parallel with that, the majority of the guidelines and toolkits are focused on the broader concept of social media and the use of social media, whereas there are a few specialized guides for SNSs and the use of SNSs.
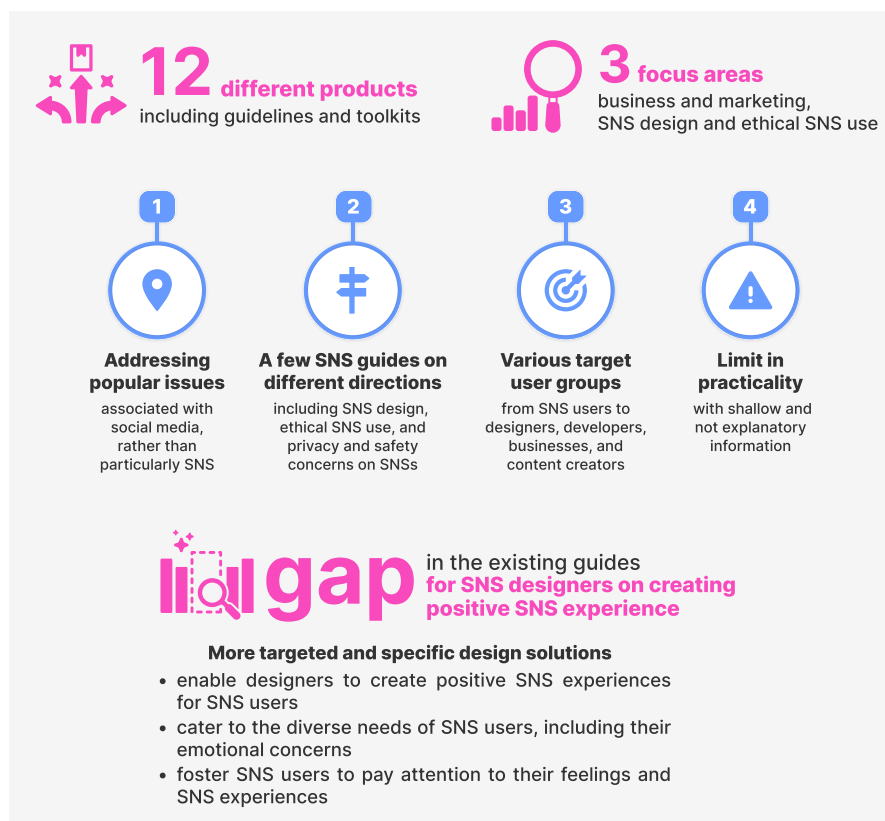
Figure 4.20 Summary of benchmarking research

The collected guidelines or toolkits on SNS use provide guidance for ethical information sharing on SNS, ethical guidelines for social media campaigns, the privacy and safety concerns on SNS, and how designers or developers could improve SNS experience and avoid potential risks on SNS use. This finding indicates a lack of resources that are tailored to the particular challenges of SNS use. It is also noteworthy that the target user group of the collection of guidelines varies widely, from SNS users to designers, developers, businesses, and content creators. Moreover,

the information provided in the existing solutions tends to remain shallow and not explanatory, which may limit their practicality in providing meaningful guidance to their targeted user groups.

Consequently, there is a design gap in the available solutions regarding enhancing the positive user experience on SNS use. This gap could be replaced with a supportive design solution that can help SNS designers to promote user well-being and create a positive digital environment. With the design of the intervention, SNS users might become active users in their decisions and make more informed actions while using their SNS accounts as they gain awareness.

4.6   Research Findings

The analysis of data discloses two major themes that elucidate the user problems and concerns associated with SNSs that impact on user SNS experience which are *the limits of SNSs* and *user's boundaries of their SNS use* (see Fig. 4.21).
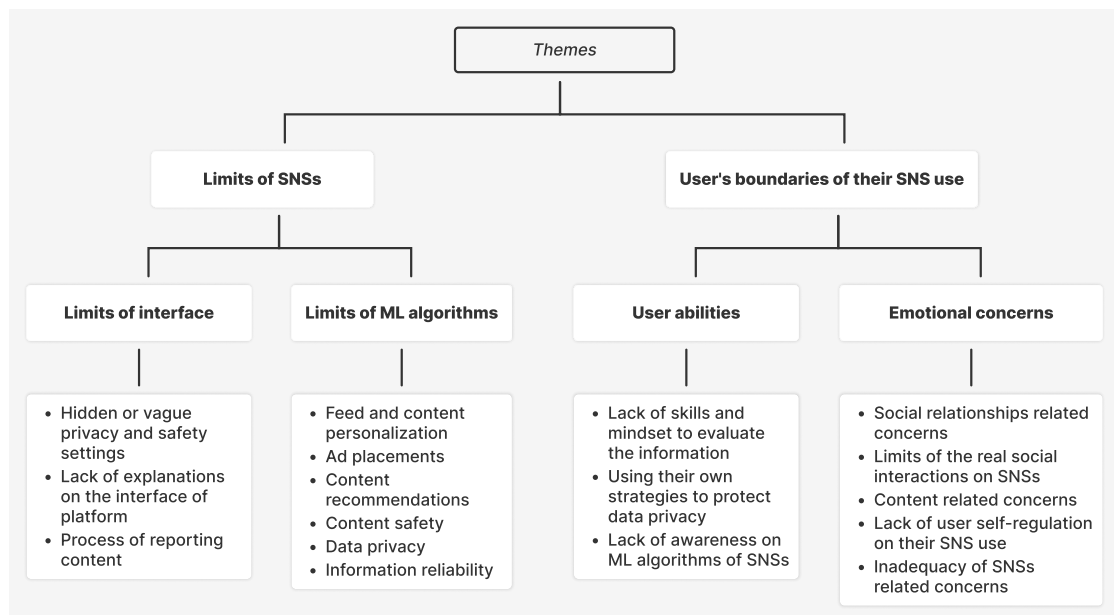
Figure 4.21 Themes and sub-themes of research findings

The first theme, focused on the limits of SNSs, encompasses two sub-themes: *limits of SNS interfaces* and *limits of ML algorithms*. Within the interface, users express difficulties with privacy and safety settings; in fact, the participant observation study presents the concern about hidden or unclear privacy features on the SNS interface, while the participants of the online survey indicate a lack of explanations on how their data is utilized by the platforms, emphasizing the importance of transparency. This lack of visibility and understanding regarding how their personal information is being protected and shared on the platform raises privacy and safety concerns. Another limitation within the interface is the slow process of reporting content. Users find it

frustrating when they encounter inappropriate or harmful content and experience delays in getting a resolution. Additionally, keeping the reported content visible to other users by the system and not giving a notice on the interface to others on that issue are identified as user dissatisfaction.

Moving on to the second sub-theme of the limits of SNSs, the limits of ML algorithms on SNSs, which is a more subtle dimension of the SNSs. The limits of ML algorithms have an influence on the user experience, classified into six different aspects: *feed and content personalization*, *ad placements*, *content recommendations*, *content safety*, *data privacy*, and *information reliability*. Even though these six aspects are not clearly evident in the interface of SNSs, they are significantly important aspects that show the incapabilities of ML algorithms in SNSs. While personalization can enhance the user experience, there are user concerns about algorithmic biases, filter bubbles, and echo chambers, especially for Twitter. Users are worried that they might be exposed to a limited range of perspectives and miss out on diverse content. They also stress that they were disappointed by seeing a number of irrelevant or similar suggested contents ranked higher in their feed. Even further, ad placements on SNSs suggest that the targeting algorithms may not always align with user preferences and needs. In addition, users raise questions about the reliability of content recommendations and give feedback to ensure the accuracy and relevance of the suggested content. Content safety is also affected by the ML algorithms since the algorithms can fall short of content moderation; thus, they are likely to miss the toxic and violent content shared on the platforms. Therefore, this malfunctioning of ML algorithms is another dimension that deepens the negative emotions on user experience. Besides concerns related to content and feed, data privacy is a major concern within the limits of ML algorithms on SNSs. Users express worries about how their personal information is collected, stored, and utilized by the platforms. For that matter, several respondents of the online survey and the participant of the participant observation study declare that they benefit from their own strategies to protect their data privacy while using social network platforms. Additionally, they desire more control over their data and increased transparency regarding data handling practices. The final factor defined is information reliability, in which users also emphasize their concern about the reliability of the information presented on their platforms. The ML algorithms of SNSs fail to combat fake news and misinformation; indeed, users assert that perturbation about the potential consequences of unreliable information, including the distortion of reality, the formation of incorrect perceptions, and being manipulated by the misinformation.

The second theme is the user's boundaries of their SNS use which depends on the challenges stemming from users' SNS usage, and its sub-themes revolve around *user abilities* and *emotional concerns* that shape their SNS experience. Under the sub-theme of user abilities, several dimensions are identified. Firstly, users express vulnerability towards encountering fake news and misinformation on SNSs. They lack the

necessary skills to critically evaluate the information they come across. Hence, this highlights the need for improved media literacy education and tools to help users navigate and discern credible information on SNSs. Secondly, users have a lack of awareness regarding how to protect their own data and how their user data are utilized by the platforms and other external parties rather than the features of SNSs, which indicates an inadequacy of clear and solid explanations on how to manage privacy settings and control data sharing.

The second dimension, emotional concerns, is multifaceted, including various aspects of the SNS experience. Firstly, the research studies reveal concerns related to users' social relationships on SNSs. The findings highlight a sense of superficiality or shallowness in online interactions and a desire for more meaningful and authentic connections. Secondly, according to experience maps generated as a part of the analysis of preliminary experience, and the results of the online survey, real social interactions, one of the user engagement types through social network platforms, are the most affected type. The possibilities for real social interactions in SNSs are more limited compared to other types of user engagements, they often fall short in providing opportunities for genuine face-to-face interactions or deeper offline relationships. Therefore, users may not fully replace their face-to-face social relationships, which results in building weak social relationships. In fact, it leads to short-term user satisfaction regarding meeting basic user needs such as decreasing the feeling of loneliness and boredom for a short period. Furthermore, users have content-related emotional concerns while their SNS uses, such as anxiety, anger, or unpleasant surprise due to encountering fake visuals or representations, and deceptive content that contains misinformation. Additionally, the challenges arising from the way of users' SNS usage also contain the lack of user self-regulation on their SNS use. Addictive behaviors, such as excessive time spent on SNSs or constantly seeking validation from others through likes or comments are the potential damage to user's self-esteem and their mental health. Similarly, users could experience negative emotional states, including feelings of loneliness, anxiety, self-comparison, and a general sense of dissatisfaction or unhappiness, and this could be associated with their SNS usage. Lastly, the inadequacy of SNSs, including their interface design and the functioning of the ML algorithms, explained previously in the section, also leads to negative emotions dominating the user experience.

In conclusion, the research findings underscore that user experience within the context of the SNS is influenced by several dimensions, which constitute two sides, the platform itself and the users. Therefore, there is an opportunity for a design intervention that enables the design teams of SNS to create meaningful social interactions and an emotionally fulfilling environment that prioritizes user needs and enhances the overall SNS experience, which would enhance user self-awareness and empower users to make informed decisions on their SNS usage.

Chapter 5

DESIGN PROCESS

This chapter presents the approach employed to develop a user-centered design solution for the challenges identified in the preceding chapters. Building upon the insights gained from the literature review and the results from the field study, including the participant observation study, online survey, and benchmarking research, this chapter outlines the systematic steps undertaken to create a meaningful and supportive design proposal for the improvement of the SNS experience of individuals.

The design process uses a user-centered design approach to acquire insights into the needs and behaviors of users and to develop a design proposal. The design process benefits from the Double Diamond design process model, embodying four main parts: Discover, Define, Develop, and Deliver (see Fig. 5.1).
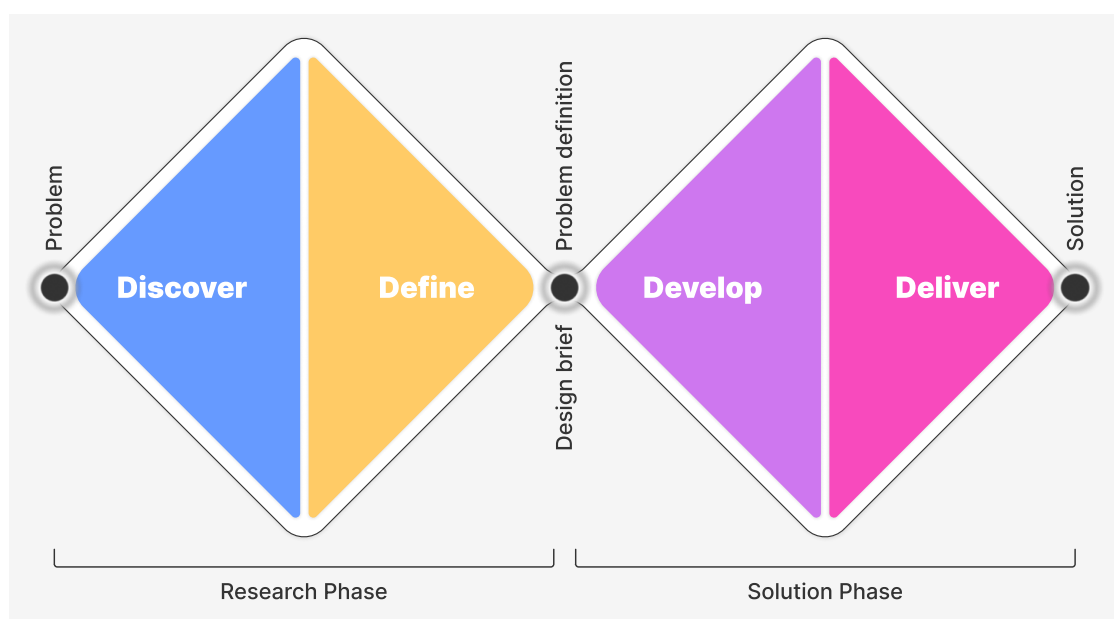
Figure 5.1 The Double Diamond design process model of the British Design Council

Based on this model, the process starts with the Discover step, and in this study, it means exploring and understanding what the research problem is. Then, it continues with the Define step, where collected insights are analyzed and converged to recognize the problem definition. The second diamond is the solution phase, and it begins with the Develop step, which involves diverging different design ideas and brainstorming to solve the defined problem. The last step is the Deliver step, which is converging the ideas and providing one final outcome.

5.1   Design Directions

In the section on possible design directions, three potential concepts were initiated to address the identified needs and goals of SNS users:

1. **Digital manifesto:** One possible design direction is to create a digital manifesto that serves as a platform for broadcasting the knowledge gained from the research. This manifesto can encapsulate the key findings, insights, and recommendations derived from the study, presenting them in a concise and accessible manner. By disseminating this knowledge, the digital manifesto aims to raise awareness among SNS users, designers, and stakeholders about the challenges and opportunities associated with SNSs It can serve as a call to action, inspiring individuals to engage in responsible and mindful SNS usage.

2. **Supportive tool for SNS designers:**   Another design direction involves developing a tool specifically designed to provide necessary information as a supportive source for SNS designers. This tool can provide a framework for designers to access and apply the research findings and insights effectively. The tool can serve as a valuable resource, empowering designers to make informed decisions, mitigate negative impacts, and create more user-centered and emotionally fulfilling SNS experiences.

3. **Self-reflection toolkit:**   A third design direction focuses on creating a self-reflection toolkit that guides users in examining their own SNS activities and behaviors from an external perspective. This toolkit can consist of several phases or exercises that encourage users to invest time and effort into self-analysis and self-awareness.   By fostering self-reflection, this toolkit aims to empower individuals to make conscious choices, set healthy boundaries, and develop a more balanced and intentional approach to their SNS engagement.

Out of the three design directions considered, the second one, developing a supportive tool for SNS designers, stands out as the most promising and impactful choice since it was considered that this direction has the potential to significantly enhance user experience by supporting designers with a valuable resource.

5.2   Jobs-To-Be-Done (JTBD)

Job-To-Be-Done (JTBD) is a concept in the field of product and service design that focuses on understanding the underlying motivations and needs of users. It highlights looking beyond the superficial features or functions of a product and delves into the deeper reasons why users make certain choices. It involves identifying the specific situations, motivations, and expected outcomes that surround a user's need or problem. For that reason, based on the research findings, the JTBD framework was created as can be seen in Fig. 5.2.

The proposed JTBD statement outlines the intention to provide a supportive design solution for SNS designers involved in the development process of SNSs.   The framework acknowledges the negative impacts faced by SNS users and aims to address them during the design phase.   By creating an emotionally fulfilling environment that prioritizes user needs, the solution seeks to enhance the overall SNS experience for users.

Situation		Motivation		Expected Outcome
When		**I want to**		**So**
SNS users experience negative consequences due to the limits of several SNS aspects and the boundaries of their SNS use	**+**	provide a supportive design solution for SNS designers who are involved in the development process of SNSs	**+**	the solution can assist SNS designers to mitigate these negative impacts in the design phase, and they can create an emotionally fulfilling environment that prioritizes user needs and enhances the overall SNS experience

Figure 5.2 The proposed JTBD

5.3   SNS User Personas

As the universe of SNS is quite broad, there are various user groups from young individuals, and novice users to social media influencers, and business owners. Therefore, to represent different users in the realm of SNSs, three distinct personas were developed. By making use of these personas, valuable insights into the needs, pains, and goals of SNS users allow for a deeper understanding of users' experiences and guide the design process.

The first Persona, Mia Wilson, is a 16-year-old student who expresses a desire for authentic connections and the freedom to shape her own digital journey (see Fig. 5.3). She faces challenges such as addictive scrolling, concerns about privacy, and a lack of knowledge about how ML algorithms impact her user experience.   The second Persona, Zoe Carter, is a small business owner seeking to optimize her brand's performance on Instagram (see Fig. 5.4). She aims to understand how machine learning algorithms can be leveraged to enhance her account's visibility and engage

with her target audience more effectively. Finally, the third Persona is George Bennett, who just entered the world of SNSs (see Fig. 5.5). He relies on his grandchild's guidance to navigate account settings and seeks to make informed choices to safeguard his data. His needs encompass empowering his SNS usage abilities, safely using his account, and protecting his own privacy.

Characteristic

Familiarity with technology

Knowledge on ML algorithms

Abilities to control their SNS use

Emotional concerns when using SNS accounts

Mia Wilson, 16
student

Favorite SNSs

"In the wild world of social media, I'm stuck in a never-ending cycle of addictive scrolling and freaking out about my privacy. All I really want is authentic connections and the freedom to shape my own digital journey!"

Needs
- Learning how to protect data and privacy on SNSs
- Building more healthier relationships
- Gaining awareness on how to control her own user experience

Pains
- Encountering mental problems, including addictive use of TikTok and online cyberbullying
- Lack of knowledge on how ML algorithms affect her user experience

Goals

She wants to **maintain more meaningful interactions** on digital world.

Figure 5.3 Persona - 1

Characteristic

Familiarity with technology

Knowledge on ML algorithms

Abilities to control their SNS use

Emotional concerns when using SNS accounts

Zoe Carter, 29
small business owner

Favorite SNSs

"I'm determined to crack the code of ML algorithms and take my brand to new heights. I don't really get how to use the features of Instagram for my brand. I'm hungry for knowledge to optimize my content and engage with my target audience in meaningful ways!"

Needs
- Comprehending how ML algorithms can be exploited to enhance her account's performance
- Having no doubts about her content visibility to the target groups

Pains
- Not knowing fully how to utilize the features of SNSs for commercial purposes
- Not being able to grasp all dimensions that can affect the user experience due to not having full proficiency in ML algorithms

Goals

She wants to **improve her user engagement** with her target groups and **improve the performance of her brand**.

Figure 5.4 Persona - 2

These personas serve as a foundation for the design process, enabling the development of a supportive design solution that addresses the specific requirements of each persona. Furthermore, they were regarded in the design brief as they shed light on user needs, pains, and goals.

Figure 5.5 Persona - 3

5.4 Design Brief

In this section, the objectives, requirements, and constraints of the design proposal are outlined by providing a clear understanding of what needs to be achieved. The design brief serves as a guiding reference throughout the design process. Considering the "who, why, what" aspects and finding design contexts or situations would help formulate a comprehensive design brief for the design proposal.

Based on the findings from the literature and field research, the design proposal is to create a tool for SNS designers that would provide support and empower SNS designers to address users' needs, problems, and concerns about SNS usage. The design proposal aims to improve the user experience and satisfaction of SNS users by guiding SNS designers working on the development of such platforms in addressing users' needs effectively. Additionally, by facilitating the creation of meaningful social interactions and an emotionally fulfilling environment on SNSs, it is aimed to achieve to SNS users enhance their self-awareness and make more informed decisions on their SNS usage.

Background The proliferation of SNS has transformed the way people connect, communicate, and engage with each other. However, despite the widespread adoption of SNSs, many users face challenges, frustrations, and unmet needs within these digital spaces. Based on findings from literature reviews and field research, from the usability issues of the SNS features and privacy concerns about their data to reliability of information and emotional concerns, SNS users encounter various obstacles that hinder their experience and satisfaction. To address these challenges faced by SNS users and enhance the user experience across diverse platforms, it is crucial to adopt a user-centered approach in SNS design. Moreover, it is evident that SNS users seek solutions that cater to their needs, problems, and concerns regarding SNS usage. Designing solutions that effectively address these user needs requires a

deep understanding of their behaviors, motivations, and aspirations within the context of each platform's unique features and objectives. In response to these findings, the design proposal seeks to enhance the overall user experience and satisfaction within SNSs by providing SNS designers with a supportive tool that enables them to effectively address the needs, problems, and concerns of SNS users. Integrating insights from relevant literature and real-world case studies, the design proposal provides SNS designers with a comprehensive framework for user-centered design principles that can be applied across diverse SNSs. By leveraging this knowledge and guidance, designers will be equipped to create SNSs that not only meet the foreground needs of users but also address their underlying concerns and aspirations for their well-being.

Potential Solution "What?" The design proposal is to create a supportive tool for SNS designers, aiming at enhancing the user's positive experience and satisfaction within SNSs and fostering user well-being and self-awareness. The design solution comprises 10 principles organized into four categories: interface design, ML algorithms, user abilities, and user emotional well-being. These principles can serve as a comprehensive framework to guide SNS designers and other professionals who work on the process of the creation and enhancement of SNSs in understanding and meeting the needs, problems, and concerns of SNS users effectively.

Components of the Design Solution:

1. **Interface Design:** This category focuses on designing SNS interfaces that prioritize user privacy, provide clear data handling policies, and offer user-friendly and responsive design elements. The principles emphasize transparent privacy settings, explanations of machine learning algorithms, and an efficient process for reporting inappropriate content.

2. **ML Algorithms:** This category highlights the importance of understanding the impact of machine learning dimensions on the SNS user experience. The principles advocate for explanations of ML dimensions and controllability of ML-powered features such as personalization and recommendations.

3. **User Abilities:** This category provides information on how SNS designers can support users in critically evaluating the information on SNSs and offers strategies for privacy and safety.

4. **User Emotional Well-Being:** This category emphasizes users' emotional needs and concerns, and advocates encouraging authentic interactions and implementing features that monitor and support user well-being.

To deliver the design proposal to its target audience, a dedicated website can be created, and it can provide comprehensive guidance and resources for SNS designers, addressing the specific needs, problems, and concerns of SNS users. Through the website, SNS designers can have access to a wealth of information and resources

tailored specifically to the context of SNS. The proposal needs to consider that each SNS has diverse features, objectives, and target audiences. Thus, the supportive tool requires being designed in a flexible and adaptable way, allowing designers to apply the principles in a way that aligns with the unique characteristics of each digital platform they work on.

Besides these, the website ought to be designed with a user-centered approach, ensuring easy navigation, visual appeal, and accessibility for designers of varying expertise levels. It can feature interactive elements such as design patterns, checklists, and downloadable assets, facilitating the practical implementation of the principles in real-world SNS design projects. Furthermore, the website can include essential pages, such as an About page and a Contact page. The About page can consist of information about the purpose and background of the design proposal, while the Contact page can enable designers to reach out with inquiries or feedback, fostering an interactive and collaborative community.

By delivering the supportive tool through a dedicated website, the design proposal can ensure that SNS designers have a centralized platform for accessing comprehensive guidance and knowledge to cater to diverse user needs and challenges. This approach can facilitate effective user interactions, informed decision-making, and the practical application of the principles in real-world SNS design projects, ultimately leading to enhanced user experiences and satisfaction in the SNS landscape.

Target Audience "Who?" The primary target audience for this design proposal is SNS designers and developers who are involved in the creation and enhancement of SNSs. These professionals play a crucial role in shaping the user experience and overall functionality of SNSs. They are responsible for translating user needs, problems, and concerns into tangible design solutions. The target audience may comprise individuals, who possess a solid understanding of SNSs and are familiar with the challenges faced by SNS users, with a background in UX, UI, human-computer interaction, or related fields. In addition, the target audience may include UX researchers, product managers, and other stakeholders who are involved in the design and development process of SNSs. These individuals contribute to the decision-making process and collaborate with designers to ensure the successful implementation of user-centered design principles.

It is important to note that the design proposal also indirectly targets SNS users themselves. By empowering SNS designers with a supportive tool and guiding them to address user needs effectively, the ultimate beneficiaries are the SNS users who will experience improved user experiences, enhanced well-being, and greater satisfaction within SNSs.

Objectives "Why?" While there are numerous design guidelines, tools, and supportive resources available for designers and developers working in the broader context of social media, there is a lack of comprehensive guidance specifically tailored to the unique challenges and context of SNSs. Existing solutions often provide general insights into social media, but they do not offer a deep understanding of the intricacies and specific needs of SNS users. For that reason, the design proposal aims to bridge this gap by providing SNS designers with a supportive tool that offers detailed and focused information on addressing the needs, problems, and concerns of SNS users. By providing SNS designers with a supportive tool and comprehensive framework, the design proposal seeks to enhance the user experience and address user concerns effectively. This is of utmost importance as it contributes to increased user satisfaction and retention. The designers can make users more informed about the platform and their actions, consequently, they can improve positive experiences on SNSs by fostering mindful and active user engagements while SNS usage. Additionally, it also recognizes the impact of using SNSs on users' emotional well-being. It aims to create digital platforms that foster meaningful social interactions and emotionally fulfilling environments. By empowering designers to consider emotional aspects in their designs, the proposal can create online platforms that promote positive emotions, emotional well-being, and self-awareness among users, which is crucial as emotional well-being plays a significant role in users' engagement, trust, and long-term satisfaction within SNSs.

Overall, the design proposal holds immense importance as it aims to enhance the user experience, address user concerns and challenges, promote emotional well-being, and enable informed decision-making. By focusing on these aspects, the proposal seeks to create SNSs that provide users with a positive and satisfying experience, fostering user satisfaction, and well-being within the digital social landscape.

Design Situations While considering the design proposal including 10 principles, several design situations can be taken into account as a reference for the proposed idea. By incorporating these design situations, the aim is to ensure that the proposal is not merely theoretical concepts but they are grounded in real-world examples of effective SNS design. Therefore, this approach ensures that the proposed principles are rooted in real-world stories and can be effectively applied to address user needs, problems, and concerns in diverse SNS design scenarios. In this respect, the design situations are based on the three personas explained earlier in this chapter:

1. **A teenage female user on TikTok:** In this case, the focus is on the young user actively engaging on TikTok. She values authentic connections and desires the freedom to shape her own digital journey. However, she faces challenges such as addictive scrolling and privacy concerns. Therefore, the design proposal needs to address the pain points by offering features that promote mindful usages, such as

personalized content curation, privacy controls, and notifications that encourage responsible SNS behaviors. By understanding the need for authentic connections and privacy-conscious experiences, the design solution will provide a platform that fosters meaningful interactions while respecting users' privacy.

2. **A small business owner on Instagram:** In this situation, a small business owner starts utilizing Instagram to promote their business. In fact, Instagram is the main platform for her personal use, but, in this case, the user does not have a full of understanding and knowledge about the business features of Instagram to improve her Instagram use. Thus, Instagram designers need to provide detailed information in the platform's interface so that the user can effectively manage her Instagram presence, and engage with her target audience. Indeed, the design solution can also cover the issues related to business-centered, and empower the designers to create positive user experience.

3. **An elderly man with little experience in the digital world:** In this case, the subject is the newcomer's experience on SNSs, focusing on the experience of elder people. As a newcomer, the user faces usability challenges and has limited knowledge and skills to manage his account's privacy and safety. The design proposal requires recognizing the need for simplicity and ease of use both for newcomers and older adults.

By considering the diverse needs and pain points of the SNS users through these design situations, the design proposal of creating a supportive tool for SNS designers can ensure that the design solution is tailored to address their specific challenges and provide meaningful interactions. It can take into account the different requirements of distinct SNS users and can focus on delivering a user-centered design that enhances the overall SNS experience.

Design Competitors To ensure the design proposal stands out and offers a unique value proposition, it is essential to analyze and understand the competitive landscape in the realm of SNSs. This competitive analysis serves as a foundation for creating a design proposal that not only meets the needs of SNS users but also distinguishes itself from the competition. In the previous chapter, the comprehensive benchmark research that explored available design guidelines, tools, and resources, including the ones for SNS designers, was conducted. The research involved analyzing the strengths and weaknesses of various competitors. For this reason, the evaluation of this benchmark research can serve as a reflection to identify design competitors for the design proposal, and it can be helpful for positioning the design proposal to address the pain points and unmet needs that may have been overlooked by competitors. It can leverage the analysis conducted during the benchmark research to create a proposal that offers a distinctive and enhanced user experience for positive SNS usage.

5.5   Information Architecture

The information architecture of the website presents the organization and structure of its content and features, and it constitutes three main tabs: *Homepage*, *About*, and *Contact* page (see Fig. 5.6). Each of these tabs serves a specific purpose and provides valuable information to the users.

The *Homepage* is the central component of the website, where individuals can explore different categories of principles that are explained in the design brief. By organizing the principles into categories, the visitors of the website can easily navigate and access the information they look for. When the user chooses one of the categories, they can navigate to the dedicated page of the chosen category. On that page, users can explore the principles of the chosen category with the necessary information. In addition, they find and download the checklist that can be useful for designers to practice the principles in their design process.

The *About* page is dedicated to explaining the mission and purpose of the website. It provides an overview of the website's goals, the motivation behind its creation, and the intended impact it aims to achieve. This page may include information about the research conducted.

The *Contact* page enables users to reach out to the responsible person or team behind the website. It serves as a communication channel for users to ask questions, provide feedback, or seek further information. The page may include a call-to-action button where the users can send a message. To do so, the page shows the website's commitment to engaging with its users and fostering a sense of openness and accessibility.

5.6   Wireframes

Following the development of the information architecture, the wireframes of the website design are created to represent the website's layout and structure in *Figma*.

The *Homepage* wireframe features a clean and organized layout, with a prominent header displaying the website's logo and navigation menu (see Fig. 5.7). Below the header, there is a short description of the website, and four cards representing each category of the principles: Interface design, ML algorithms, User abilities, and User emotional well-being. Each card integrates a title, brief description, and a button, where the users can navigate to the dedicated page of the category. The page also involves a footer, including the logo, the links to the *About* and *Contact* page as a simple text-based menu, and additional information, such as copyright.
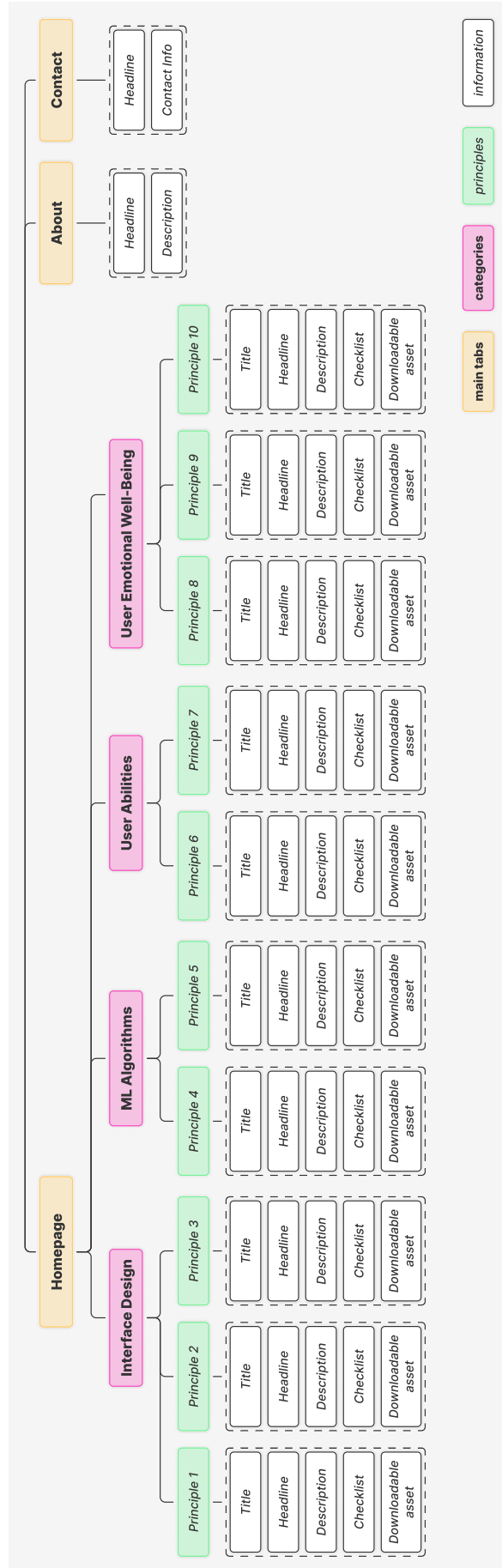
Figure 5.6 Information architecture of the website design
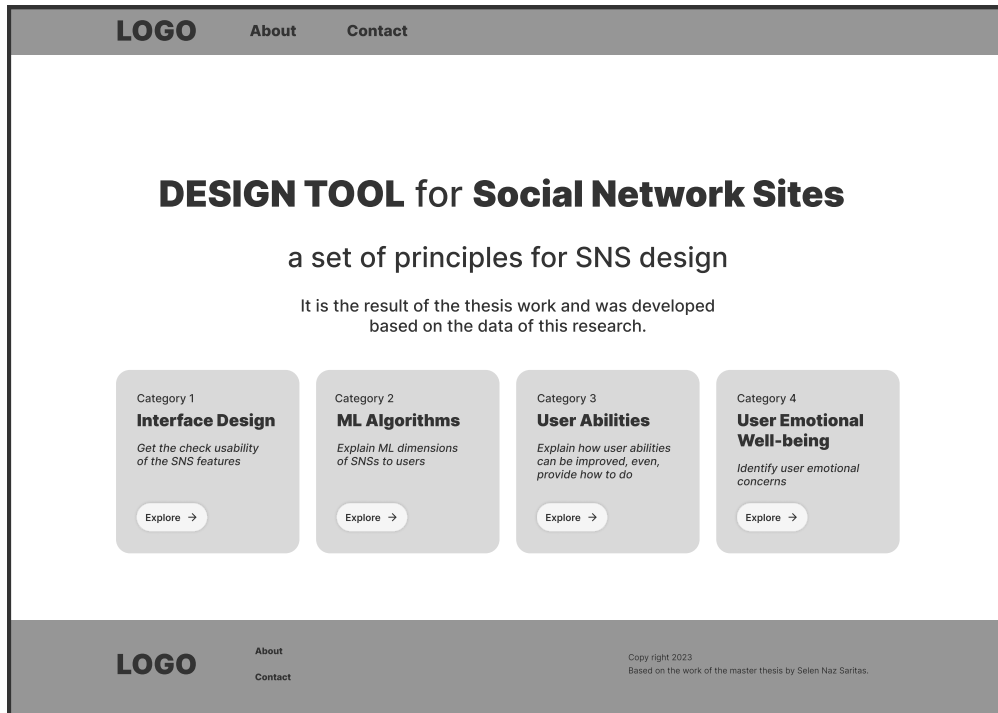
Figure 5.7 The *Homepage* wireframe

Each dedicated page of the category presents the principles in that category by providing the title of the principle with its explanation (see Fig. 5.8). To make users easily switch from one principle, or category to another, the page also includes the side navigation bar. Additionally, at the end of the page, there are two buttons to allow users to move to the next principles, and to turn back to the previous principles.
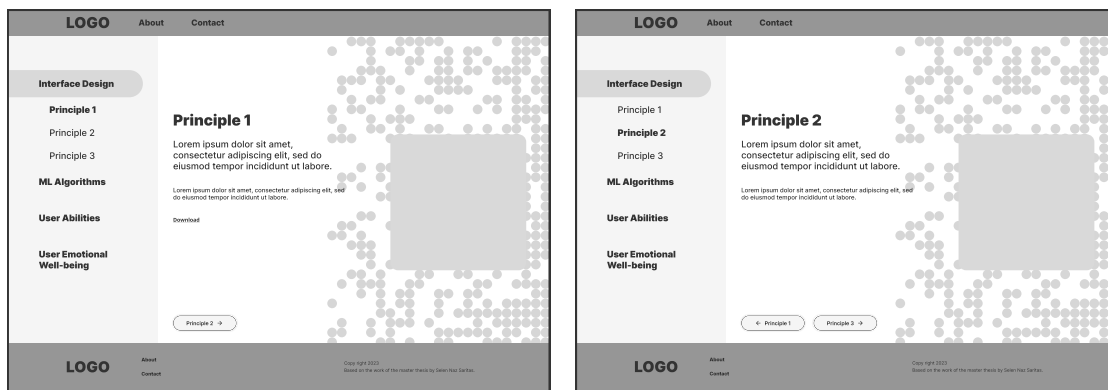
Figure 5.8 The wireframes showing dedicated pages of the principles

The wireframe of the *About* page consists of a clear title that introduces the website and a description of the website's purpose and goal (see Fig. 5.9). The last part of the wireframe development demonstrates the *Contact* page. This wireframe has a similar visual design to the *About* page and includes a title and explanation that invites the users to get in touch with the responsible person behind the website. The page also provides a clear call-to-action, encouraging users to submit their messages or questions and assuring them of a timely response.
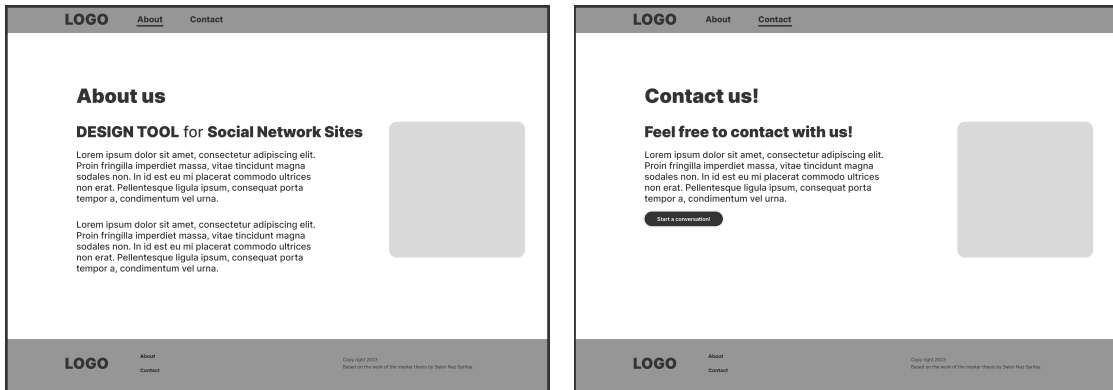
Figure 5.9 The wireframes showing *About* page and *Contact* page

5.7   Design System and Logo

In order to effectively communicate the purpose and values of the design proposal, the *Supportive Design Tool for Positive Social Network Site (SNS) Experience*, it is essential to consider the design material and logo of the website. These elements play a crucial role in visually representing the website's mission, creating a positive user experience, and establishing a strong brand identity. This section focuses on describing the design material and logo, outlining the considerations to ensure they align with the website's goals and resonate with the target audience (see Fig. 5.10).

The design material encompasses various aspects, including typology, color palette, and logo. Starting from the color palette, vibrant and energetic colors were chosen to evoke positivity and trust. The choice of typography consists of two different fonts *Montserrat* and *Open Sans*, and with these preferences, clean and modern visual design was aimed to strike a balance between approachability and professionalism, ensuring that the content is easily legible and visually appealing.

The logo serves as the visual representation of the website's purpose and the value of the design proposal. The website is called *Positive SNS Experience*. Therefore, while designing the logo, it was considered to reflect positivity. Based on this consideration, several ideas were initiated, and the most appealing one is determined. The logo design integrates a sign of plus and a circle and combines two colors, blue and purple, in it.
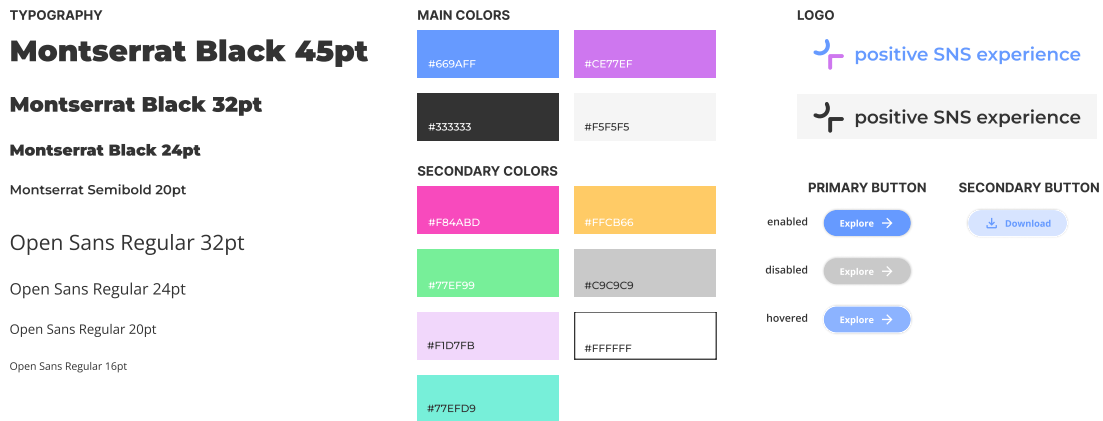
Figure 5.10 Design material and logo

5.8 The Development of the Design Proposal

Based on the previous steps, the development of the website design involved translating the information architecture, wireframes, and design system into a functional and visually cohesive website. The Homepage design of the website encompasses the header and the footer and four cards representing the categories of the principles (see Fig. 5.11). The card design includes a relevant icon, a short description for each category, and a button, which allows users to navigate to the dedicated page of the category.
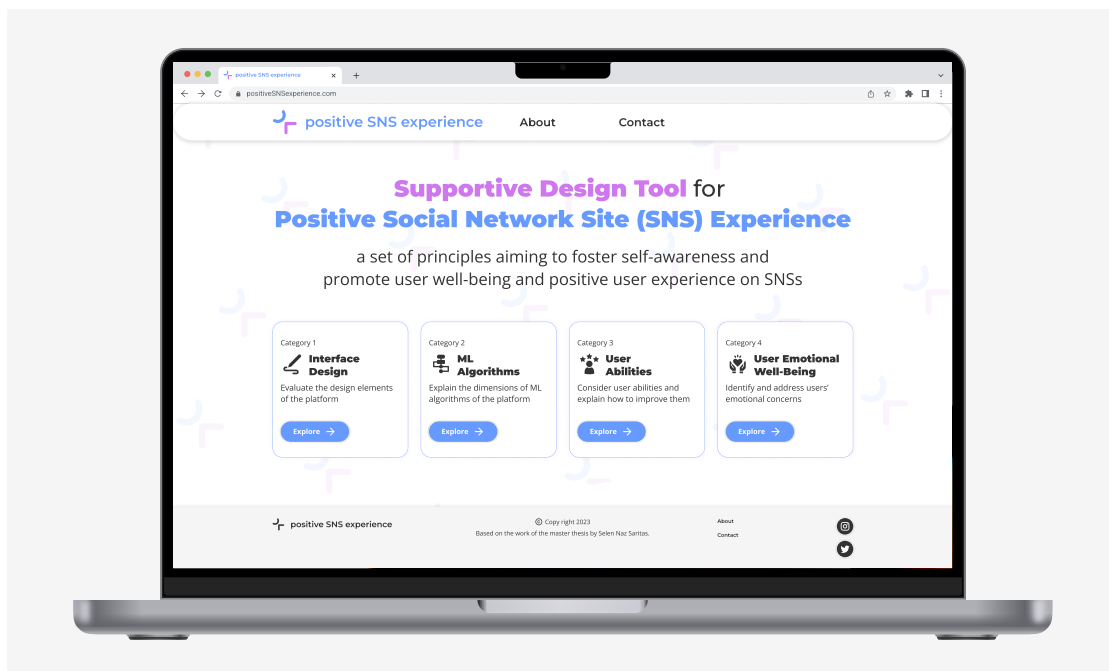
Figure 5.11 The homepage of the website design

Besides the *Homepage*, the website has other two main components: The *About* page, and the *Contact* page. The *About* page welcomes users and provides information about the purpose and goal of the design proposal while with the *Contact* page, the website enables designers and other third-party individuals to reach out with inquiries or feedback, fostering an interactive and collaborative community (see Fig. 5.12 and Fig. 5.13).

Each one of the principal pages contains a side navigation bar, the title, an explanation of the principle, and a list of questions as a checklist that can be a facilitator for the designers to implement the principles in their design process. To navigate to the other page of categories or principles, the design offers two buttons; in addition to this, all the information presented on the page can be downloadable with a button. Furthermore, the design of the page is also supported by the visuals on the right side of the page (see Fig. 5.14).
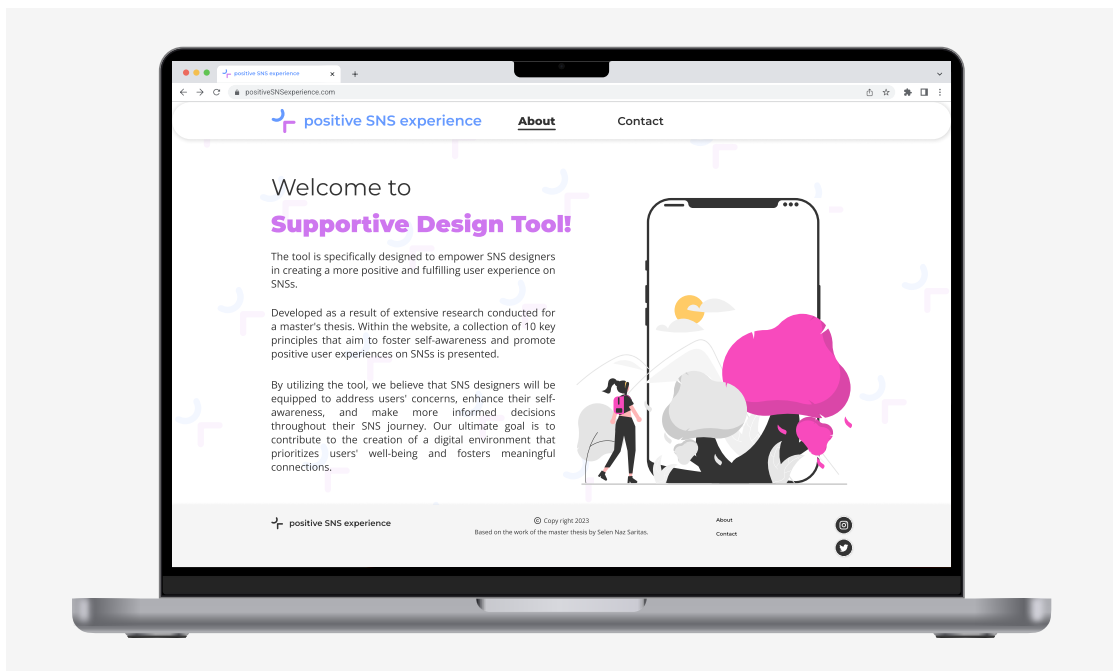
Figure 5.12 The About page of the website design

Category 1: Interface Design The first category presented in the website design is *Interface Design*, which includes three principles for assisting SNS designers while creating SNS interfaces to prioritize user privacy, provide clear data handling policies, and offer user-friendly and responsive design elements.

Principle 1: Privacy and Safety The first principle focuses on providing clear and visible information on users' privacy and safety features. To safeguard user privacy and safety effectively, it is essential for SNSs to furnish easily accessible and comprehensible details pertaining to users' privacy settings. This can be entailed by providing meticulous control over personal information, encompassing aspects such
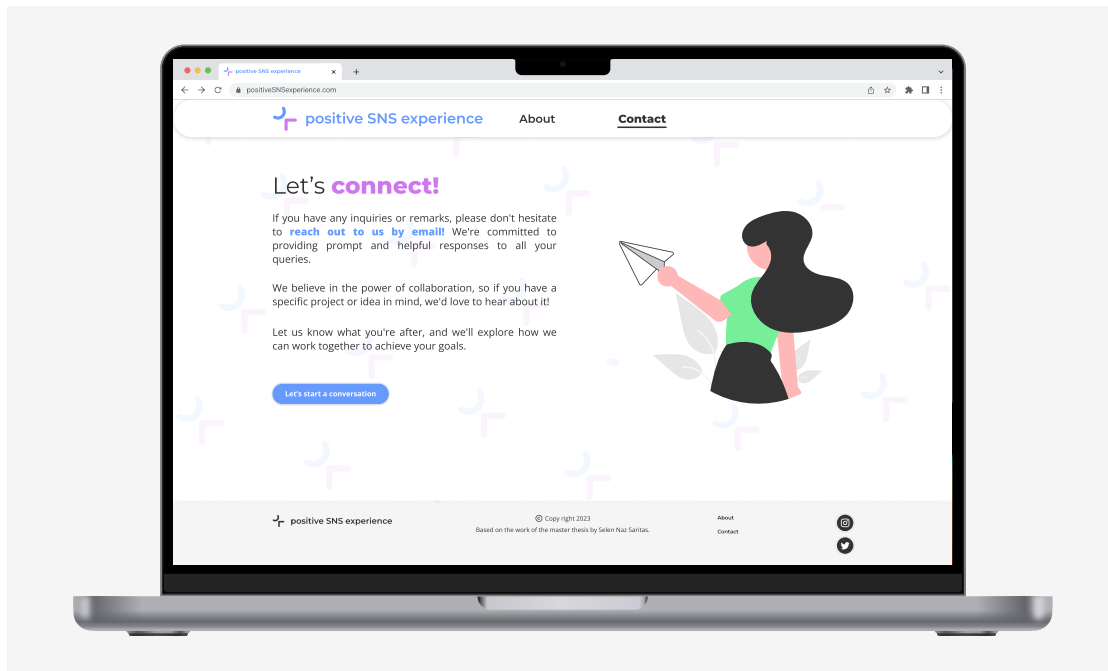
Figure 5.13 The Contact page of the website design
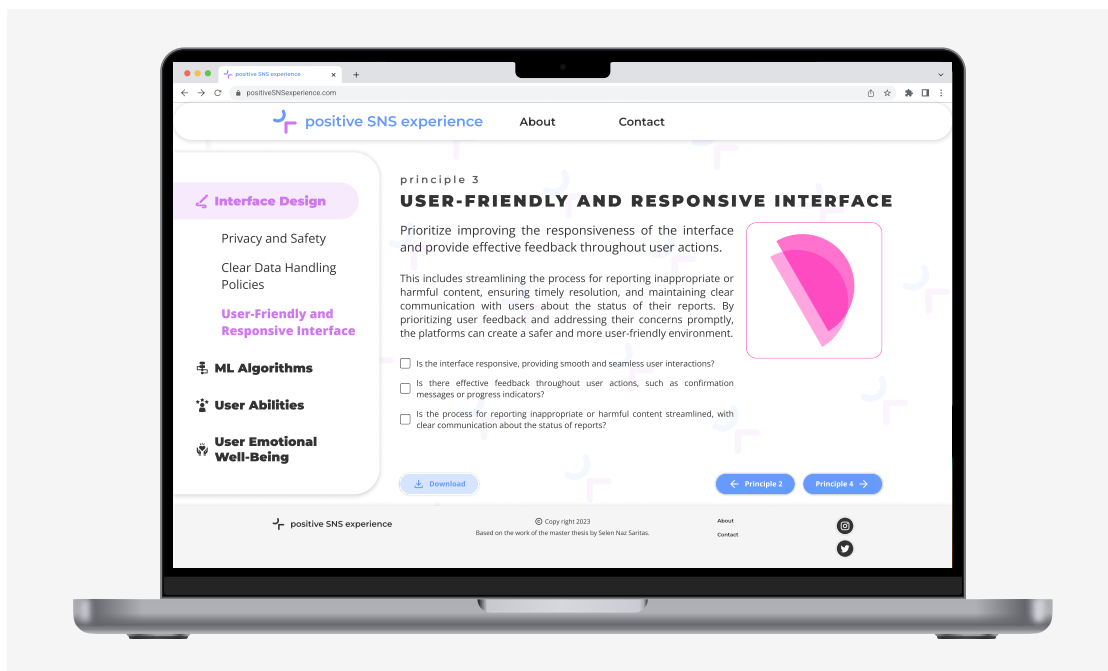
Figure 5.14 The page design of the third principle

as data collection, sharing, and third-party access. By guaranteeing transparency in the utilization of data, SNSs can cultivate trust and enable users to make well-informed choices concerning their privacy.

Principle 2: Clear Data Handling Policies The second principle suggests communicating explicit information about the functioning of ML algorithms and the system of the platform, which is important to foster trust among users. This entails providing clear explanations of data handling policies, encompassing the methods of data collection, storage, and sharing. By offering comprehensive and easily accessible information, users can gain a deeper understanding of how their data is utilized, enabling them to make informed decisions regarding their engagement on the platform.

Principle 3: User-Friendly and Responsive Interface This is the last principle in the first category highlights the significance of a user-friendly and responsive interface. To foster a positive SNS experience, SNS designers can prioritize improving the responsiveness of the interface and provide effective feedback throughout user actions. This includes streamlining the process for reporting inappropriate or harmful content, ensuring timely resolution, and maintaining clear communication with users about the status of their reports. By prioritizing user feedback and addressing their concerns promptly, SNSs can create a safer and more user-friendly environment.

Category 2: ML Algorithms The second category is *ML Algorithms*, which demonstrates two principles that are focused on understanding the impact of ML dimensions on the SNS user experience.

Principle 4: ML Algorithms Dimensions This principle focuses on the dimensions of ML algorithms. To empower users, it is important to provide explanations on how different dimensions of ML influence the user experience on SNSs. Informing users about various ways of ML algorithms integrated into different features of SNSs is crucial to increase users' self-awareness. This can be achieved by educating users about the algorithms' impact on content curation, personalization, and recommendations. By increasing transparency and promoting user understanding, SNSs can build trust and enable users to make informed choices regarding their engagement with ML-powered features.

Principle 5: User Control The fifth principle presents the considerations of user control. SNSs can ensure that users have readily available information and control options for ML-powered functionalities. This entails offering settings related to personalization, ad preferences, and recommendations, enabling users to tailor their experience based on their preferences. By granting users control, the platforms can empower them to curate the content they consume and enhance their overall user experience.

Category 3: User Abilities The third category, *User Abilities*, offers two principles to provide information on how SNS designers can support users in critically evaluating the information on SNSs and offer strategies for privacy and safety.

Principle 6: User Mindset and Skills This principle advocates supporting users in enhancing their critical evaluation skills while consuming information on SNSs and providing access to credible external sources for information reliability for a healthier digital experience. To do this, the designers can integrate fact-checking tools, provide educational resources on media literacy, and promote critical thinking. By equipping users with the necessary skills, SNS can empower them to navigate the digital landscape more effectively and make informed decisions.

Principle 7: Methods of Privacy and Safety To promote user privacy and safety, users' awareness and skills can be improved. Therefore, this principle describes that designers of the platforms also can take into account and present users with strategies for maintaining data privacy and safety. This can cover providing tips and best practices for secure account settings, guidance on identifying and reporting scams or fake accounts, and educating users about the potential risks and vulnerabilities. By offering proactive measures, SNS designers can help users protect themselves and their data.

Category 4: User Emotional Well-Being The last category involved in the supportive design tool is *User Emotional Well-Being*, which draws attention to users' emotional needs and concerns and advocates encouraging authentic interactions, and implementing features that monitor and support user well-being.

Principle 8: Emotional Needs and Concerns In order to ensure greater user satisfaction, it is essential for SNS designers to take into account the emotional needs and concerns of users. The user's SNS experience can notably impact the user's subjective well-being, and bring serious problems, particularly mental problems. For that reason, developing features and interactions that encourage positive emotions, and support users' well-being can create the key points for the success of the SNSs. In this way, the negative experiences, such as feelings of loneliness or social comparison can be mitigated. By establishing an environment that provides emotional support, SNS can improve the overall user experience and foster a sense of community.

Principle 9: Meaningful Social Interactions To enable genuine and authentic social connections, SNS can give precedence to meaningful engagements. This involves encouraging the development of deeper relationships, facilitating discussions centered around shared interests, and minimizing the significance placed on superficial metrics, such as likes or followers. By promoting more substantial social

interactions, the designers can cultivate a sense of community and reinforce the connections between users. This, in turn, can contribute to a more enriching and gratifying user experience within the platform.

Principle 10: Well-Being support The last principle of the design proposal is Well-Being Support, which advocates implementing features that can monitor user well-being indicators, such as excessive usage patterns or negative emotional states. Furthermore, offering resources, prompts, or interventions to assist users in maintaining their mental health and well-being can be advantageous. Partnering with mental health experts or organizations can ensure the provision of relevant support and resources to users when necessary. By integrating well-being support, the platforms can exhibit a dedication to user care and cultivate a healthier digital ecosystem.

In conclusion, by adhering to these principles of the design proposal and utilizing the checklist for each principle, SNS designers can assess and evaluate their design choices to create platforms that prioritize privacy, user control, well-being, and meaningful interactions. This holistic approach can ensure that SNSs address the diverse needs and concerns of users, fostering a positive and fulfilling user experience. For further, the prototype of this design proposal can be accessed **here**.
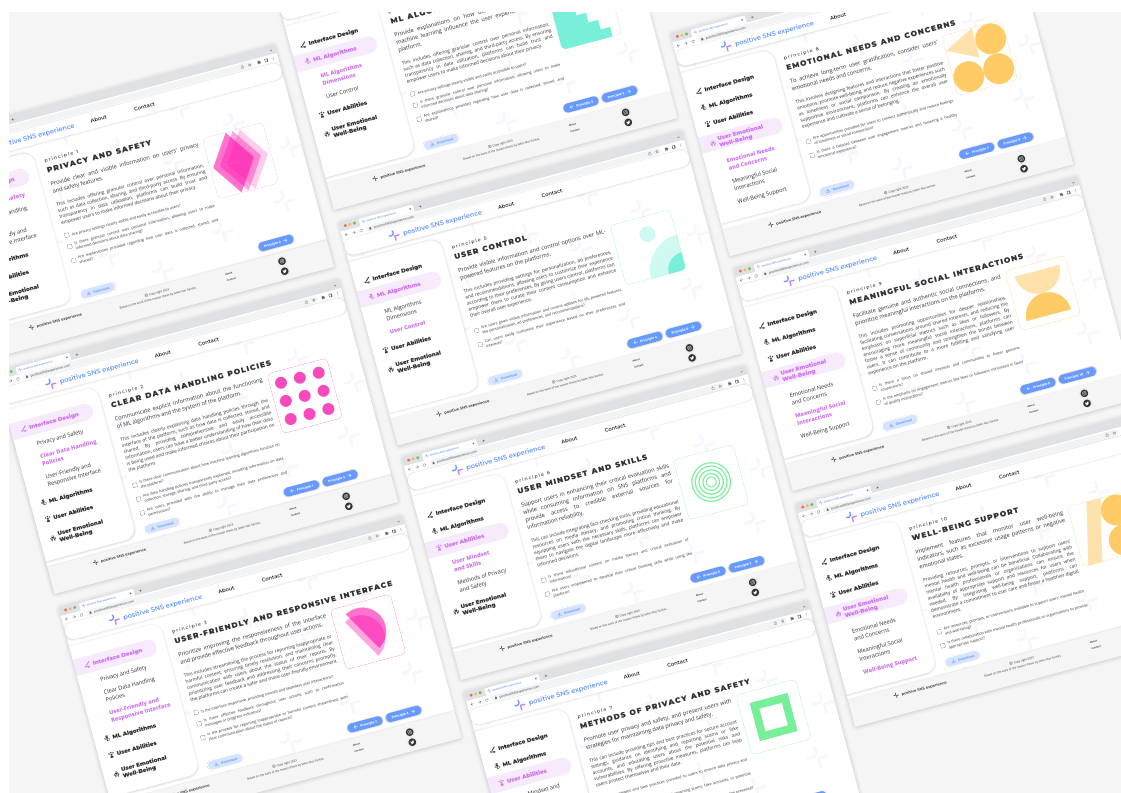
Figure 5.15 Positive SNS Experience website

Chapter 6

CONCLUSION

This chapter presents an overview of the study and connects the main findings of the research and the design proposal regarding the research questions that guided the inquiry of this thesis. The chapter also will draw connections between the different aspects of SNS design and their implications for user experience and well-being. Moreover, the role of designers as mediators between users and the most advanced SNS technologies will be discussed. By the end of this chapter, the limitations of the research and the future research endeavors will be presented.

6.1 Overview of the Study

In this thesis, a comprehensive exploration of the intersection between SNSs, UX, IxD, and ML algorithms, within the consideration of ethical principles, and user self-awareness have been embarked on. This thesis aims at exploring the challenges and opportunities presented by SNSs in contemporary society. While aiming to explore these challenges in the context of SNS, the thesis simultaneously aims at investigating the potential of UX and IxD practices and the role of designers in fostering positive user experiences, improving user self-awareness, and promoting meaningful interactions on SNSs. By examining these issues, the thesis aims at making a contribution to the development of user-centered design practices for SNSs, considering the creation of positive digital solutions.

Through the investigation, the research has shed light on the profound impact of SNSs on various aspects of individuals' lives and society as a whole. These platforms have revolutionized communication, enabling global connections, sharing of experiences, and engagement in virtual communities. However, alongside these benefits, the research has also uncovered concerns and drawbacks associated with SNS usage, including effects on an individual's physical and mental well-being, changes in social norms and behaviors, and potential privacy and security issues.

By addressing the main research question of this thesis, namely, the design directions for enhancing user experience and well-being on SNSs and the role of UX and IxD designers in mediating between users and advanced SNS technologies, several important dimensions that impact user experience have been identified, which are rooted in both the platform itself and the users of SNSs. The dimensions include the elements of the platform interface, the ML algorithms that are incorporated in the system of SNS, and the users' abilities and emotions. By investigating these dimensions and their impact on user experience and interactions through the literature review and the field research, including the participant observation study and online survey, the study provided insights into how SNSs can better address user needs, concerns, and limitations.

One significant finding of this study is the importance of user self-awareness in fostering positive user experiences on SNSs. By empowering users with knowledge about the dimensions that shape their experience and providing mechanisms for self-reflection, self-control, and informed decision-making, SNSs can promote active and responsible usage. This includes incorporating transparency and disclosure mechanisms that inform users about data usage, algorithmic processes, and privacy practices.

The study has also delved into the emotional aspects of SNS usage and the influence of users' emotions on their behaviors and interactions. Based on the findings from the research, individuals are highly susceptible to experiencing negative emotions on SNSs, such as loneliness, lower self-esteem, and depression. Even further, by making use of the complete participant observation method, valuable first-hand perspectives on user emotions, needs, and concerns were gained. Based on the insights from this study, the user experience is mostly dominated by the negative emotions that arise from the dimensions presented previously, and these negative emotions, including anxiety, anger, and disappointment, lead the user to take an action that can increase user satisfaction. Yet, in most cases, these reactions do not bring any user satisfaction. By leveraging the insights gained through the complete participant observation method, the thesis has identified potential design interventions and proposed meaningful digital solutions that prioritize user needs and concerns, aiming to mitigate negative emotions and enhance user satisfaction.

Furthermore, the ethical implications of SNSs and emerging technologies, particularly ML algorithms, have been examined. SNSs integrate diverse ways and techniques of ML algorithms from the personalization of the user feed, and the content curation to ad preferences, and content recommendations. Studies from the literature and the findings from the online survey have revealed that these technologies yield a wide range of user concerns and problems. The thesis underlines user challenges related to data privacy and safety, algorithmic bias, and the potential for manipulation, such as echo chambers, and recognizes the importance of considering ethical principles in

SNS design to address user concerns. Moreover, since these emerging technologies are subtle and not evident in the interfaces of these platforms and the platforms' transparency policies are not effective to provide necessary information to their users, the user's self-awareness is quite limited to their interests and knowledge. For this reason, by integrating ethical considerations into the design process, SNSs can foster trust, empower users, and contribute to a healthier digital ecosystem.

When all the knowledge gained through the comprehensive research process is moved to the fields of UX and IxD, these two fields have a crucial role in mediating between users and advanced SNS technologies. UX and IxD designers who are involved in the development phase of these platforms are responsible for understanding user needs, behaviors, and emotions, and translating them into meaningful design solutions. They have the opportunity to shape the user experience by considering the dimensions identified in this study, including platform interface elements, ML algorithms, and user abilities and emotions. These designers can contribute to enhancing user experiences on SNSs by employing user-centered design practices. By incorporating mechanisms for user self-reflection, self-control, and informed decision-making, designers can empower users to become more self-aware of their SNS usage and make conscious choices that align with their values and goals. Moreover, UX and IxD designers can address the emotional aspects of SNS usage by creating interfaces and interactions that promote positive emotions and mitigate negative ones. They can re-evaluate the features of the platform, or design new features that foster a sense of belonging, social support, and meaningful connections. By understanding the user's emotional journey and the factors that trigger negative emotions, effective design interventions can be proposed that redirect user behaviors towards more satisfying and fulfilling experiences on SNSs.

However, the research revealed that there is a gap in providing support or guidance to SNS designers to improve user experience on SNSs. As a result of this, to further support UX and IxD designers in their efforts to enhance user experiences on SNSs and foster user well-being and self-awareness, a design proposal has been developed. The thesis offers to design a website as a supportive design tool for SNS designers to create a positive SNS experience. This design proposal consists of 10 principles in 4 categories aiming to foster self-awareness and promote user well-being and positive user experience on SNSs by providing the designers with a comprehensive framework and resources to guide the design process for SNSs. The proposed website can serve as a valuable resource that encourages designers to adopt user-centered design practices and consider the ethical implications of their design decisions.

In conclusion, this thesis has contributed to a deeper understanding of the challenges and opportunities presented by SNSs and the role of UX and IxD in addressing them and has provided insights into the development of user-centered design practices for SNSs, emphasizing ethical considerations and the promotion of positive user experiences. By

considering the needs and behaviors of SNS users, examining the impact of SNS design and ML algorithms, investigating the gap between user needs and the limitations of SNS features, and developing design insights and proposals, this thesis has laid the groundwork for a user-centered and ethically responsible approach to SNS design.

6.2   Reflections on the Study

Reflecting on my attitude toward SNSs after conducting this research, I have gained a deeper understanding of their potential benefits and drawbacks as a designer and researcher. Throughout this thesis, I have explored the challenges and opportunities presented by SNSs and examined the role of UX and IxD in fostering positive user experiences, improving user self-awareness, and promoting meaningful interactions on these platforms.

I consider that SNSs are not inherently evil or completely useful tools, but rather, they are akin to play dough which is shaped by the individuals who use them and how they are utilized. Instead, I believe that these platforms have a profound place and impact on individuals and societies, and users must be aware of their capabilities and recognize their agency and actively engage in shaping their own experiences. In this context, the role of SNS designers emerges as a key mediator, responsible for enabling users to have more positive experiences. By leveraging user-centered design practices, designers can empower users and support them toward meaningful interactions and well-being on these platforms. It can be through the careful curation of design elements, the integration of ethical considerations, and the cultivation of user self-awareness that designers can shape the SNS experience. Within the scope of this thesis, I have proposed a design tool aimed at supporting designers in their efforts to improve the positive user experience on SNSs and mitigate negative effects. By providing designers with a comprehensive framework and resources, this tool is intended to enhance user well-being, promote positive interactions, and ultimately reduce the adverse consequences associated with SNS usage.

By extending my understanding of the dynamic and multifaceted nature of SNSs, I remained optimistic about their capacity to facilitate connections and community engagement while recognizing their potential drawbacks. I believe that by embracing responsible design practices, fostering users on more informed decisions, and emphasizing the mediating role of designers, we can harness the transformative potential of SNSs for the benefit of individuals and society. Furthermore, I believe that in addition to refining existing SNS platforms, it is important to explore alternative approaches that prioritize privacy, authenticity, and meaningful connections for future research.   This may involve re-imagining the design of SNSs, considering new

interaction paradigms, or even exploring entirely new platforms. By researching and experimenting with innovative solutions, designers can address the evolving needs and concerns of SNS users and foster a healthier digital ecosystem.

To conclude, this thesis has offered valuable insights into the complexities of SNSs and has highlighted the crucial role of UX and IxD designers in shaping the user experience. By combining user-centered design practices, ethical considerations, and the recognition of users as active actors, designers may create SNSs that create positive user experiences, enhance user well-being, and foster user self-awareness. I hope that the findings and the design proposal presented in this thesis will inspire further research, innovation, and discussion in the field of SNS design, ultimately leading to more positive, responsible, and satisfying experiences for users in the digital realm.

6.3 Limitations and Recommendations for Future Research

The thesis has several limitations and areas for future research that should be acknowledged. One limitation is the lack of testing on the usability and quality of the information presented in the proposed website design. Since the primary user group consists of designers involved in SNS development, it may be challenging to access and involve them in the testing process. To address this limitation, future research should consider conducting usability studies to assess the effectiveness and user-friendliness of the proposed design tool.

Additionally, since the proposed design tool's impacts on both users and society will emerge over a longer period, the thesis, at its current stage, cannot draw definitive conclusions about the outcomes of the design proposal. To address this issue in further research, longitudinal studies should be undertaken to assess the long-term effects of the impacts and effectiveness of the idea, which is the supportive design tool for enhancing positive SNS experience.

Moreover, the rapidly evolving landscape of SNSs, with new platforms, features, and algorithms being introduced frequently, poses a challenge. The research conducted for this thesis is based on the knowledge available up until the knowledge cutoff date, and it may not capture the latest developments and trends in SNSs.

Another limitation is the reliance on participant observation and self-report measures, which may introduce bias and subjectivity. Users' perceptions and interpretations of their experiences on SNSs can vary, and self-report measures may not always capture the full complexity of user experiences. Future research could consider incorporating objective measures, such as behavioral data analysis or physiological measures, to complement subjective data collection methods. This would provide a more

comprehensive understanding of user experiences on SNSs. Moreover, future research could include more qualitative research methods, such as interviewing the SNS users to decrease the subjectivity of the data or making use of a focus group study with SNS designers and other actors, such as psychologists or sociologists who can collaborate and make contributions to the design of the positive SNS experience.

By recognizing these limitations and addressing them through future research, the field can overcome these challenges and further advance user-centered design practices for SNSs. Incorporating usability testing, longitudinal studies, staying updated with SNS developments, and integrating objective measures alongside subjective data collection methods will enhance the validity, applicability, and overall impact of future research in fostering positive user experiences, promoting user well-being and user self-awareness, and addressing ethical concerns in the context of SNSs.

Appendices

A Self-Diary of Participant Observation

	Instagram	Twitter	LinkedIn
Date: Time:			
Describe experience			
Why did I use it? (purpose of use)			
When I use it, which emotion does drive me? (loneliness, boredom, …)			
What features did I used?			
Likes			
Dislikes			
What did I feel?			
Am I aware of AI or ML algorithms while using it?			
How did the AI feature effect my experience?			
How did I notice the AI or ML algorithms?			
Did I do any action that can effect AI system?			
What data do I share?			
What data is collected?			
What if/Wishes			
Other notes			

131

B Example Data Analysis of Participant Observation Study

Purpose of the use

Communicating with friends / family
Seeing what my followers have shared
Need of watching something while eating
Watching funny videos
Being updated
Checking feed and DMs
Checking job recommendations
Making new networks
Catching up to the news

Emotions (sentiment) driving to use

Feeling of connection / attachment
Curiosity
Daily routine / Addiction
Loneliness
Feeling of obligation (seeing it as a duty)
Driving sleep away
Boredom
See others' perspectives
Fear of missing the recent news/events

Positive emotions

Happy
Relaxed / Relieved
Appreciated

Post-use emotions

Negative emotions

Frustrated
Confused
Silly
Felt misleaded
Felt manipulated
Bored
Gloomy / Cheerless
Overwhelmed
Demotivated for continuing to use
Irritated
Unhappy
Angry
Annoyed
Discomfort and worried about privacy
Worried about being in an echo chamber
Worried and doubtful about the credibility and reliability of the tweets

Instagram

Homepage
Following / Favorite feed
Stories

DMs
Private / Group chats
Video calling

Profile
Favorites
Account settings

Explore
Search
Content explore

Twitter

Homepage
Following / For You feed

DMs
Private / Group chats

Trends
Trends for you
Search

Spaces
Spaces

LinkedIn

Homepage
Feed

Jobs
Recommended for you
Search

Features that I used

My main interactions

Instagram:
Like / Share / Save
Searching a keyword / account
Sending messages (text, photo, video)
Reporting a content as spam, irrelevant
Video calling

Twitter:
Retweet / Like / Share
Reporting a content as spam, irrelevant
Sending messages (text)
Searching a keyword / account

LinkedIn:
Like
Searching a keyword / account
Giving feedback about suggested jobs

C Online Survey Questions

Social Network Sites (SNSs) and Self-Awareness

Introduction

Hi! My name is Selen and I'm a master student studying Digital and Interaction Design at Politecnico di Milano. This survey is a part of my master's thesis focusing on the use of social network sites and your self-awareness on your use.

By answering a series of questions, you will be helping me gain valuable insights about your experiences and behaviors on social network sites for my research. The survey is completely anonymous. Your responses will be kept confidential and will only be used for research purposes. Your participation is voluntary, and it won't take more than 5 minutes to complete.

If you have any questions or comments, feel free to reach out to me at: selennsaritas@gmail.com.

Thank you so much for taking the time to complete this survey.

Your contribution is greatly appreciated!

Selen Naz Saritas

Section for demographic information

1. Age*
- Under 12
- 12-17
- 18-24
- 25-34
- 35-44
- 45-54
- 55-64
- 65 or over

2. Gender*
- Female
- Male
- Don't want to specify

Section for SNS experience of individuals:

3. Which of the following social network sites do you currently have an account with? (multiple selection)*
- I don't have any SNS account.
- Facebook
- Instagram
- Twitter
- TikTok
- LinkedIn
- Snapchat
- Tinder
- BeReal
- ResearchGate
- Other

4. If you don't have any account, please tell me why?
- I don't want to share my life.
- I don't know how to use it.
- I think that they are waste of time.
- I lack of technological capabilities.
- Other

5. What negative consequences have you ever experienced on your social network site use?*
- Physical problems (Eating disorders, texting thumb, dry eye disease etc.)
- Mental problems (Depression, lower self-esteem, loneliness, anxiety etc.)
- Weakening of social relationships
- Decrease in your quality of life
- Cyberbullying
- Online harassment
- Identity theft
- Other:

6. Please select the social network site that you have used the most.*
- I don't use SNSs.
- Facebook
- Instagram
- Twitter
- TikTok
- LinkedIn
- Snapchat
- Tinder
- BeReal
- ResearchGate
- Other:

7. Please select the social network site that you have used the second-most frequently.*
- I don't use SNSs.
- Facebook
- Instagram
- Twitter
- TikTok
- LinkedIn
- Snapchat
- Tinder
- BeReal
- ResearchGate
- Other:

While answering the following questions, please consider the two sites that you marked as your most used social network sites.

8. Please select how likely are you to interact with your chosen social network sites in a day?*

	(1)	(2)	(3)	(4)	(5)	
Not at all likely	○	○	○	○	○	Extremely likely

9. **What is your primary purpose(s) to use your chosen social network sites?***
- Maintaining existing social relationships (e.g. communicating with friends/family members)
- Finding new people with shared interests and developing social relationships
- Sharing your own experience, opinions
- Feeling social belonging to a group/community
- Getting news/information from events or other people
- Shopping
- Getting enjoyable time
- Killing time
- Other:

10. **Please rate how useful your chosen social network sites are for the followings: (1- not at all useful, 5- extremely useful)***
- To connect with friends/family/colleagues
- To connect with new people
- To find new opportunities (finding jobs, building professional networks)
- To find out new topics, suggestions, interests, etc.
- To get news/information
- To share your experience or to promote your opinion, brand or product
- To enjoy
- To shop

11. **Please rate how frequently do you feel the following emotions when using the two chosen social network sites: (1- never, 5- always)***
- Happiness/Enjoyment
- Sadness
- Satisfaction
- Anger
- Relief
- Anxiety
- Surprise
- Fear
- Disgust

12. **What would be the most important factor(s) that affects your SNS experience in either positive or negative way?***
- The interface of the social network site
- Reliability of information
- Transparency/Explainability of the social network site (e.g. regarding the functioning of the SNS, or user data)
- User privacy and safety
- Functions and features of the social network site (e.g. content management, account settings etc.)
- The display of ads and other suggested contents
- Other:

13. **What is your greatest concern when using social network sites? (e.g. seeing irrelevant/ inappropriate content, or being worried about your data privacy etc.)***
- *Short answer*

14. **Did you encounter any problem/challenge while using the social network sites? Please explain.***
- *Paragraph answer*

15. Please indicate how aware are you of the functions available in the interface of your chosen social network sites?*

	(1)	(2)	(3)	(4)	(5)	
Not at all aware	◯	◯	◯	◯	◯	Extremely aware

16. Please indicate how much do you aware of machine learning algorithms used on your chosen social network sites, including their purpose and functionality?*

	(1)	(2)	(3)	(4)	(5)	
Not at all aware	◯	◯	◯	◯	◯	Extremely aware

17. Do you use any methods, tools, or apps to protect your data privacy while using social network sites? If so, could you please explain how you use them? (e.g. verifying suspicious information with other sources)*

• *Paragraph answer*

18. Have you ever discussed your social network site use with friends or family members? If so, what strategies did they suggest to increase your self-awareness and enhance your experience?

• *Paragraph answer*

19. How effective do you believe these strategies are in improving your self-awareness and your SNS experience?

	(1)	(2)	(3)	(4)	(5)	
Not at all effective	◯	◯	◯	◯	◯	Extremely effective

20. How much do you think gaining self-awareness about your use of social network site might improve your experience?*

	(1)	(2)	(3)	(4)	(5)	
Not at all improve	◯	◯	◯	◯	◯	Extremely improve

21. If you have any additional suggestions/notes for how users can be empowered through increasing their self-awareness on social network sites, please explain them here.

• *Paragraph answer*

22. Please provide your email address, if you are interested in participating in the next phase of the research:

• *Short answer*

D   Experience Map of Instagram

Engagement types	anticipation	enter	multisensorial experiences	virtual/simulated relationships	information exchange	multisensorial experiences	information exchange
Touchpoints	**Mobile Phone**	**Mobile Phone**	Homepage > **Stories**		Profile > **Settings**		Homepage > **IG Feed**
		Open	**Watch**	**Like or React**	**Change Setting**	**Scroll**	**Feedback**
	• Completing my daily IG routine • Hoping to see what my followings have shared • Hoping to catch up the recent news and get information • Hoping to watch funny animal videos and escape from the real-world stress • Hoping to kill some time by watching some reels while eating • Hoping to communicate with my friends	• Seeing DMs notification on my phone screen • Clicking the notification • Opening Instagram • Noticing that there are many stories to watch and messages waiting a reply	• Starting to watch stories • Seeing what friends are doing/ sharing • Seeing so many ads that are based on my past Internet search • Getting bored with seeing many ads • Passing ads very quickly • Worrying about my privacy • Feeling unpleasant	• Liking or giving reactions to my friends' stories • Happy and amused by see friends' moments • Feeling connected with friends • Writing replies to their stories	• Checking the setting to find about what I can do about ads • Discovering some settings about ads • Unpleasantly surprised due to seeing the ads setting for the first time • Changing the ads preferences • Selecting several ad topics as "less favorite" • Disappointed and angry by seeing that change didn't improve the experience • Still continuing to see so many ads	• Starting scrolling through my feed • Seeing what friends are doing/ sharing • Feed always shows first posts that I haven't seen yet • Getting news from reliable accounts (organizations, politicians, celebrities) • Seeing also several suggested posts • Feeling invaded by suggestions • Starting to quick scroll on the feed for the skipping the suggestions	• Labelling some suggested posts as "not interested" • Choosing "don't suggest posts from this account" • Seeing feedback "We don't suggest post from that account!" • Relieved and pleased to see feedback from IG • Feeling unpleasant due to still seeing similar posts • Disappointed and angry by insufficient system functioning
Reflections	• Meeting different needs with different ways of interactions		• Noticing that data of past search activities are shared with IG	• Liking/reacting a story is a quick and easy way of connection but the engagement isn't so powerful.	• Settings and explanations about ads are not visible.	• Putting the posts that haven't been seen yet to higher on my feed could be good for the concern of missing out shared moments.	• Feedback process isn't sufficient and satisfactory.

Enriched Experience (baseline)

- connected with friends
- connected with the world
- highly desired to catch up updates
- relieved by getting recent news
- curious
- connected with friends
- happy and amused
- relieved by taking an action
- connected with friends
- connected with the world
- happy and amused
- relieved by getting recent news
- connected with friends
- pleased by IG feedback
- relieved by taking an action

Poached Experience

- bored and lonely
- stress
- fear of missing out
- bored with seeing many ads
- anxious about data privacy
- unpleased (seeing similar contents)
- unpleasantly surprised by discovering ad settings
- disappointed by seeing that the setting is not effective
- dissatisfied and angry inadequate system functioning
- feeling invaded by suggestions
- indignation due to shown many suggested posts
- dissatisfied and angry inadequate system functioning

138

Top (positive) emotions:
- connected with friends
- seeking new interests
- satisfied to see entertaining posts
- amused by watching funny videos
- pleased by IG feedback
- happy and amused
- relieved by taking an action
- satisfied to find relevant search result
- connected with friends
- happy and amused
- relieved by getting recent news
- happy to quickly react their messages
- satisfied by having different communication ways
- satisfied to meet basic needs

Bottom (negative) emotions:
- disappointed due to seeing similar contents
- dissatisfied and angry inadequate system functioning
- demotivated to stay in IG
- dissatisfied about system functioning

virtual/simulated relationships	multisensorial experiences	information exchange	information exchange	real social interactions	virtual/simulated relationships	exit
		IG Explore &Search		DMs > **Messages**		Site Leave
Like or Interact	**Explore**	**Feedback**	**Search**	**Connect**	**Like or React**	**Close**
• Liking friends' posts • Liking some post from other accounts (celebrities, organizations) • Happy to feel connected with friends • Feeling socially bridged	• Checking the explore section to see interesting contents • Finding some entertaining post and other type of contents • Watching funny animal reels/videos • Happy and amused • Seeing so many similar content • Disappointed due to seeing similar contents	• Labelling some contents "I see so many posts like this" to avoid similar contents • Choosing "not interested" option for some contents that aren't matching my taste • Feeling unpleasant due to still seeing similar posts • Disappointed and angry by insufficient system functioning	• Typing a word to search specific account/tag/location • Looking over that account/tag/location	• Starting to communicate with my friends • Typing messages • Sending messages • Making a video call with friends • Happy and amused to have quality time with friends • Feeling connected with friends • Relieved by getting recent news about their lives	• Liking their messages • Replying with images/emojis/gifs • Happy to quickly react their messages • Satisfied by having different communication ways	• Completing my basic needs and leaving with a feeling of satisfaction • Losing motivations to continue to scroll on my feed • Dissatisfied about system functioning • Deciding to end my IG session
		• Feedback process isn't sufficient and satisfactory.		• Sending messages and making calls are actual social connections.		• Basic needs are completed, overall experience doesn't satisfy user. • User continues to use IG despite negative feelings.

139

Engagement types / **Touchpoints**

Poached Experience — baseline — Enriched Experience

Reflections
- Twitter is used as a platform to get news from the world.
- User don't seek a social connection with friends.
- Reliability and manipulation are the biggest concerns
- Suggestions also interrupt the user experience.
- The process of reporting is slow and not informative towards user.
- It could be explanatory, transparent.
- Seeing tweets in chronological order is good.
- But not seeing clear differentiation between two feeds
- After reporting a tweet, Twitter hides tweet just from the user, not from all community.
- Not sure if the reported trending topic is removed from all Twitter or not
- ML algorithm doesn't work properly and can miss some tweets due to the punctuation marks or symbols on tweets.
- Secondary way of engagement is participating to discussions.
- Twitter is mostly used for reality check
- User is connected with the world, but the negative feelings dominate the experience.
- Deciding to end my Twitter session
- Completing my basic needs and feeling of satisfaction

Mobile Phone — anticipation
- Completing my daily Twitter routine
- Hoping to catch up the recent news and get information
- Hoping to see what my followings have shared
- Hoping to feel connection with the world
- Hoping to watch funny animal videos and escape from the real-world stress

anticipation emotions: bored and lonely / fear of missing out

Mobile Phone — enter — **Open**
- Opening Twitter
- Directly seeing sad news
- Getting news from reliable accounts (organizations, politicians, celebrities)
- Eager to get the news

enter emotions: highly desired to catch up updates / curious / connected with the world / amused by watching funny videos / relieved by getting recent news

multisensorial experiences — Scroll
- Starting scrolling through the "for me" feed
- Reading the shared tweets on my feed
- Checking and reading tweet replies
- Seeing many sponsored tweets
- Feeling invaded by suggestions
- Worried about reliability of contents
- Anxious about being manipulated

emotions: unpleased (seeing many sponsored ads) / anxious about being manipulated / feeling invaded by suggestions / anxious about content reliability / satisfied to give reactions

virtual/simulated relationships — Like or React
- Giving likes several tweets and retweeting tweets
- Satisfied to give an appreciation to tweets

information exchange — Remove
- Seeing also many suggested tweets that could be potential interests
- Feeling anxious due to being covered by suggested tweets
- Seeing these tweets with tag "you might like this"
- Removing suggested tweet
- Choosing "not interested in this tweet" or "this tweet isn't relevant"

emotions: anxious due to being covered by suggested tweets / indignation due to shown many suggested posts / relieved by taking an action

Homepage > **For me Feed**

multisensorial experiences — Scroll
- Switching to the "following" feed
- Starting scrolling in that feed
- Seeing repetitive tweets in both feed
- Worried about seeing similar opinions on my feed, being stuck on one perspective
- Seeing so many ads on my feed
- Pleased to see tweets just from my following list

emotions: unpleased (seeing many sponsored ads) / dissatisfied to see repetitive tweets in both feed / relieved by getting recent news / pleased to see tweets just from my following list / satisfied to see entertaining tweets / connected with the world / anxious about being stuck on one perspective / satisfied to give reactions

virtual/simulated relationships — Like or React
- Giving likes several tweets and retweeting tweets
- Satisfied to give an appreciation to tweets

information exchange — Report
- Seeing suspicious content
- Reporting unreliable, fake contents
- System hides the reported tweet

emotions: indignation due to see fake information / frustrated due to slow process of reporting / relieved by taking an action / pleased to get feedback from the system

Homepage > **Following Feed**

multisensorial experiences — Check Trends
- Starting checking the trending topics in Turkey
- Going through some topics to see related tweets

information exchange — Report
- Seeing sexist and racist words on tweets
- Feeling indignation and angry due to see sexist/racist tweets
- Urge to report the tweet/ trending topic
- Reporting that tweet/trending topic as "spam"
- Discarded that trending topic from the trends

emotions: frustrated due to slow process of reporting / indignation and angry due to see sexist/racist tweets / relieved by taking an action

Twitter Trends & Search

information exchange — Search
- Typing a word to search specific topic/account/ hashtag
- Looking over that topic/ account/hashtag

emotions: satisfied to find relevant search result

Profile > Settings

information exchange — Change Setting
- Going to privacy and safety settings
- Finding the settings about contents shown to me
- Muting the toxic word
- Still continuing to see that word and related tweets

emotions: disappointed by seeing that the setting is not effective / dissatisfied and angry inadequate system functioning / relieved by taking an action

multisensorial experiences — Check Spaces
- Checking the conversations ongoing
- Start listening a conversation
- Nice to have different communication channels
- Not sure how the system decides which discussions are shown to me

emotions: nice to have different communication channels / confused about how ML algorithms and system works / satisfied to meet basic needs

exit — Close
- Completing my basic needs and feeling of satisfaction
- Losing motivations to continue to scroll on my feed
- Deciding to end my Twitter session
- User is connected with the world, but the negative feelings dominate the experience.

emotions: demotivated to stay in Twitter / satisfied to meet basic needs

140

Emotion journey (Enriched Experience / baseline / Coached Experience)

- curious
- feeling of obligation
- stressing out about future
- connected with friends
- relieved by getting recent news
- satisfied to give reactions
- indignation due to see many suggested posts
- feeling invaded by suggestions
- unpleased (seeing many sponsored ads)
- pleased to get feedback about particular content
- relieved by taking an action
- frustrated to see irrelevant suggested jobs
- disappointed to not see an immediate effect
- connected with new people
- satisfied to see different types of connections
- relieved by taking an action
- frustrated to see irrelevant suggestions
- satisfied to meet basic needs
- disappointed to see many irrelevant jobs

Engagement types	anticipation	enter	multisensorial experiences	virtual/simulated relationships	information exchange	multisensorial experiences	information exchange	multisensorial experiences	information exchange	exit
Touchpoints	**Browser**	**Browser** / Open	**Homepage** / Scroll	Like or React	Feedback	**Jobs** / Scroll	Feedback	**My Networks** / Scroll	Feedback	**Site Leave** / Close
	• Hoping to catch up the recent news and get information • Hoping to see what my followings have shared • Hoping to make new networks • Checking job recommendations to see if there is any suitable job opportunities	• Opening LinkedIn • Directly diving into the shared posts on the feed	• Starting to scroll through the feed • Reading the shared post on my feed • Seeing sponsored posts • Feeling indignation due to see many suggested posts • Feeling invaded by suggestions	• Giving likes several posts	• Seeing several suggested ads and post on my feed • LinkedIn gets feedback by asking me if the post shown to me high in the feed is valuable to me • Giving feedback about the post by selecting "yes/no/not sure"	• Starting to check recommended jobs for me • Seeing irrelevant jobs • Frustration due to suggested jobs aren't matching my profile	• Giving feedback as "don't recommend this job" • Not seeing an immediate effect of the action	• Checking the possible networks • Scrolling through "My network" page to see suggested networks, groups and pages • Seeing irrelevant suggestions	• Giving feedback "don't suggest me" • Discarding recommendations from the list	• Completing my basic needs and leaving with a feeling of satisfaction • Leaving the site after a disappointment on seeing so many irrelevant contents
Reflections	• Limited range of user purposes as it is used for professional purposes only	• Similar to the other two sites, angry and anxiety are dominating emotions.			• Direct feedback about a specific post • More active role of users since immediate feedback is requested.	• Suggestions are source of frustration	• Slow process	• Several ways of increasing the network		• Even though giving feedback about posts is a relieving action, it doesn't make me feel satisfied from the site use.

Bibliography

Abiodun, O. I., Jantan, A., Omolara, A. E., Dada, K. V., Mohamed, N. A., & Arshad, H. (2018). State-of-the-art in artificial neural network applications: A survey. *Heliyon*, *4*(11). https://doi.org/10.1016/j.heliyon.2018.e00938

Abisha, K., Nilofer, J., viya, A., & Ratna, D. (2019). Detection of Twitter spam's using machine learning algorithm. *International Journal of Computer Science and Engineering*, *6*(3), 10–13. https://doi.org/10.14445/23488387/IJCSE-V6I3P103

Acquisti, A., & Gross, R. (2006). Imagined communities: Awareness, information sharing, and privacy on the Facebook. In G. Danezis & P. Golle (Eds.), *Privacy Enhancing Technologies* (pp. 36–58). https://doi.org/10.1007/11957454_3

Aghasian, E., Garg, S., Gao, L., Yu, S., & Montgomery, J. (2017). Scoring users' privacy disclosure across multiple online social networks. *IEEE Access*, *5*, 13118–13130. https://doi.org/10.1109/ACCESS.2017.2720187

Ali, M., Sapiezynski, P., Bogen, M., Korolova, A., Mislove, A., & Rieke, A. (2019). Discrimination through optimization: How Facebook's ad delivery can lead to biased outcomes. *Proceedings of the ACM on Human-Computer Interaction*, *3*(CSCW), 1–17. https://doi.org/10.1145/3359301

Alltimedesign. (2022). Social Media Design Guidelines | Top Ideas on Social Media — alltimedesign.com [[Accessed 16-Jun-2023]].

Amedie, J. (2015). The impact of social media on society. *Pop Culture Intersections 2*. https://scholarcommons.scu.edu/engl_176/2

Anand, G., & Kodali, R. (2008). Benchmarking the benchmarking models. *Benchmarking: An international journal*, *15*(3), 257–291.

Anderson, M. (2016). Parents, Teens and Digital Monitoring [Accessed: January 12, 2023]. https://www.pewresearch.org/internet/2016/01/07/parents-teens-and-digital-monitoring/

Andrejska, M. (2023). Social Media Design Guide: How to establish a distinctive visual strategy — medium.com [[Accessed 16-Jun-2023]].

Andreou, A., Venkatadri, G., Goga, O., Gummadi, K. P., Loiseau, P., & Mislove, A. (2018). Investigating ad transparency mechanisms in social media: A case study of facebook's explanations. *Proceedings 2018 Network and Distributed System Security Symposium*, 1–15. https://doi.org/10.14722/ndss.2018.23191

ASHA. (2020). Issues in Ethics: Ethical Use of Social Media — asha.org [[Accessed 16-Jun-2023]].

Ballantine, P. W., & Stephenson, R. J. (2011). Help me, i'm fat! Social support in online weight loss networks. *Journal of Consumer Behaviour*, *10*(6), 332–337. https://doi.org/10.1002/cb.374

Barrett-Maitland, N., & Lynch, J. (2020). Social media, ethics and the privacy paradox. *Security and Privacy From a Legal, Ethical, and Technical Perspective*. https://doi.org/10.5772/intechopen.90906

Baumeister, R. F., Schmeichel, B. J., & Vohs, K. D. (2007). Self-regulation and the executive function: The self as controlling agent. In A. W. Kruglanski & E. T. Higgins (Eds.), *Social Psychology: Handbook of Basic Principles* (pp. 516–539). The Guilford Press.

Berndt, A. E. (2020). Sampling methods. *Journal of Human Lactation*, *36*(2), 224–226.

Beye, M., Jeckmans, A. J., Erkin, Z., Hartel, P., Lagendijk, R. L., & Tang, Q. (2012). Privacy in Online social networks. In A. Abraham (Ed.), *Computational Social Networks: Security and Privacy* (pp. 516–539). Springer.

Biddle, S., Ribeiro, P. V., & Dias, T. (2020). TikTok told moderators: Suppress posts by the "ugly" and poor [Accessed: January 8, 2023]. https://theintercept.com/2020/03/16/tiktok-app-moderators-users-discrimination/

Bishop, C. (1995). *Neural networks for pattern recognition*. Oxford University Press.

Blum, A. L., & Langley, P. (1997). Selection of relevant features and examples in machine learning. *Artificial intelligence*, *97*(1-2), 245–271. https://doi.org/10.1016/s0004-3702(97)00063-5

Bowen, S. A. (2013). Using classic social media cases to distill ethical guidelines for digital engagement. *Journal of Mass Media Ethics*, *28*(2), 119–133.

boyd, d. (2008b). Facebook's privacy trainwreck: Exposure, invasion, and social convergence. *Convergence: The International Journal of Research into New Media Technologies*, *14*(1), 13–20. https://doi.org/10.1177/1354856507084416

boyd, d. m. (2008a). Why Youth (Heart) Social Network Sites: The Role of Networked Publics in Teenage Social Life. In D. Buckingham (Ed.), *Youth, Identity, and Digital Media* (pp. 119–142). MIT Press.

boyd, d. m., & Ellison, N. B. (2007). Social network sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication*, *13*(1), 210–230. https://doi.org/10.1111/j.1083-6101.2007.00393.x

Brandtzæg, P. B., & Heim, J. (2009). Why people use social networking sites. *Online Communities and Social Computing. OCSC 2009*, *5621*, 143–152. https://doi.org/10.1007/978-3-642-02774-1_16

Bretous, M. (2021). 7 Tips for Designing a Social Media Page That Stands Out — blog.hubspot.com [[Accessed 16-Jun-2023]].

Buffer. (n.d.). Buffer: All-you-need social media toolkit for small businesses [Accessed: December 30, 2022]. https://buffer.com/

Burke, C. (2019). TikTok admits to hiding content made by fat, LGBTQ, and disabled users [Accessed: January 8, 2023]. https://www.dailydot.com/irl/tiktok-fat-lgbtq-disabled-creators/

Cambridge University Press. (n.d.). In Cambridge dictionary. [Accessed: January 7, 2023]. https://dictionary.cambridge.org/dictionary/english/

Carr, C. T., & Hayes, R. A. (2015). Social media: Defining, developing, and divining. *Atlantic Journal of Communication*, *23*(1), 46–65. https://doi.org/10.1080/15456870.2015.972282

Carvajal, N., & Kelly, C. (2020). Trump issues orders banning TikTok and WeChat from operating in 45 days if they are not sold by Chinese parent companies | CNN Politics [Accessed: January 8, 2023]. https://edition.cnn.com/2020/08/06/politics/trump-executive-order-tiktok/index.html

Carver, C. S. (2005). Impulse and constraint: Perspectives from personality psychology, convergence with theory in other areas, and potential for integration. *Personality and Social Psychology Review*, *9*(4), 312–333. https://doi.org/10.1207/s15327957pspr0904_2

Concordia. (2016). The Power of Big Data and Psychographics | 2016 Concordia Annual Summit [Accessed: January 6, 2023]. https://www.youtube.com/watch?v=n8Dd5aVXLCc

Cookingham, L. M., & Ryan, G. L. (2015). The impact of social media on the sexual and social wellness of adolescents. *Journal of Pediatric and Adolescent Gynecology*, *28*(1), 2–5. https://doi.org/10.1016/j.jpag.2014.03.001

Cortex. (n.d.). Cortex [Accessed: December 30, 2022]. https://www.meetcortex.com/

Creswell, J. W. (2009). Research designs: Qualitative, quantitative, and mixed methods approaches. *Callifornia: Sage*.

Cronin, M. (2009). Crucial ui features of social media and networking sites. *Smashing Magazine*.

Cross, M. (2014). Chapter 1 - what is social media? In M. Cross (Ed.), *Social media security* (pp. 1–20). Syngress. https://doi.org/https://doi.org/10.1016/B978-1-59749-986-6.00001-1

Cudo, A., Torój, M., Demczuk, M., & Francuz, P. (2020). Dysfunction of self-control in Facebook addiction: Impulsivity is the key. *Psychiatric Quarterly*, *91*, 91–101. https://doi.org/10.1007/s11126-019-09683-8

DataReportal. (2022). *Digital 2022 July Global Statshot Report* [Accessed 16-Jun-2023]. https://datareportal.com/reports/digital-2022-july-global-statshot

Davies, H. (2015). Ted Cruz using firm that harvested data on millions of unwitting facebook users [Accessed: January 6, 2023]. https://www.theguardian.com/us-news/2015/dec/11/senator-ted-cruz-president-campaign-facebook-user-data

De Veirman, M., Cauberghe, V., & Hudders, L. (2017). Marketing through Instagram influencers: The impact of number of followers and product divergence on brand attitude. *International Journal of Advertising*, *36*(5), 798–828. https://doi.org/10.1080/02650487.2017.1348035

Desmet, P. (2002). Designing emotions.

Diener, E. (1984). Subjective well-being. *Psychological Bulletin*, *95*(3), 542–575. https://doi.org/10.1037/0033-2909.95.3.542

Dishon, N., Oldmeadow, J. A., & Kaufman, J. (2018). Trait self-awareness predicts perceptions of choice meaningfulness in a decision-making task. *BMC Research Notes*, *11*(1), 1–5. https://doi.org/10.1186/s13104-018-3191-2

Dourish, P. (2006). Implications for design. *Proceedings of the SIGCHI conference on Human Factors in computing systems*, 541–550.

Dove, G., Halskov, K., Forlizzi, J., & Zimmerman, J. (2017). Ux design innovation: Challenges for working with machine learning as a design material. *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*, 278–288. https://doi.org/10.1145/3025453.3025739

Dwoskin, E., Tiku, N., & Timberg, C. (2021). Facebook's race-blind practices around hate speech came at the expense of black users, new documents show [Accessed: January 11, 2022]. https://www.washingtonpost.com/technology/2021/11/21/facebook-algorithm-biased-race/

Ekman, M. (2018). Anti-refugee mobilization in social media: The case of soldiers of Odin. *Social Media+ Society*, *4*(1). https://doi.org/10.1177/2056305118764431

Elfil, M., & Negida, A. (2017). Sampling methods in clinical research; an educational review. *Emergency*, *5*(1).

Ellison, N., & boyd, d. m. (2013). *Sociality through social network sites*. Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199589074.013.0008

Emplifi. (n.d.). A powerful all-channel scheduler for Social Media [Accessed: December 30, 2022]. https : / / emplifi . io / products / social - media - marketing / features / content - scheduling-and-publishing?utm_source=socialbakers.com

European Data Protection Board. (2021). Guidelines 8/2020 on the targeting of social media users | European Data Protection Board — edpb.europa.eu [[Accessed 16-Jun-2023]].

European Data Protection Board. (2023). Guidelines 03/2022 on deceptive design patterns in social media platform interfaces: How to recognise and avoid them | European Data Protection Board — edpb.europa.eu [[Accessed 16-Jun-2023]].

Fardouly, J., & Vartanian, L. R. (2015). Negative comparisons about one's appearance mediate the relationship between Facebook usage and body image concerns. *Body image*, *12*, 82–88. https://doi.org/10.1016/j.bodyim.2014.10.004

Felzmann, H., Fosch-Villaronga, E., Lutz, C., & Tamò-Larrieux, A. (2019). Robots and transparency: The multiple dimensions of transparency in the context of robot technologies. *IEEE Robotics & Automation Magazine*, *26*(2), 71–78. https://doi.org/10.1109/mra.2019.2904644

Felzmann, H., Fosch-Villaronga, E., Lutz, C., & Tamò-Larrieux, A. (2020). Towards transparency by design for artificial intelligence. *Science and Engineering Ethics*, *26*(6), 3333–3361. https://doi.org/10.1007/s11948-020-00276-4

Fox, J., & Moreland, J. J. (2015). The dark side of social networking sites: An exploration of the relational and psychological stressors associated with Facebook use and affordances. *Computers in Human Behavior*, *45*, 168–176. https://doi.org/10.1016/j.chb.2014.11.083

Fox, J., & Warber, K. M. (2015). Queer identity management and political self-expression on social networking sites: A co-cultural approach to the spiral of silence. *Journal of Communication*, *65*(1), 79–100. https://doi.org/10.1111/jcom.12137

Froio, C., & Ganesh, B. (2019). The transnationalisation of far right discourse on Twitter. *European Societies*, *21*(4), 513–539. https://doi.org/10.1080/14616696.2018.1494295

General Data Protection Regulation. (n.d.). The right to be informed (transparency) (Article 13 & 14 GDPR) | Data Protection Commission [Accessed: January 7, 2023]. https://www.dataprotection.ie/en/individuals/know-your-rights/right-be-informed-transparency-article-13-14-gdpr%5C#:~:text=The%5C%20principle%5C%20of%5C%20transparency%5C%20requires,and%5C%20plain%5C%20language%5C%20be%5C%20used

General Data Protection Regulation. (2022). General Data Protection Regulation (GDPR) – Official Legal Text — gdpr-info.eu [[Accessed 16-Jun-2023]].

Geyik, S. C., Guo, Q., Hu, B., Ozcaglar, C., Thakkar, K., Wu, X., & Kenthapadi, K. (2018). Talent search and recommendation systems at Linkedin: Practical challenges and lessons learned. *The 41st International ACM SIGIR Conference on Research & Development in Information Retrieval*, 1353–1354. https://doi.org/10.1145/3209978.3210205

Google PAIR. (2019). People + AI Guidebook — pair.withgoogle.com [[Accessed 16-Jun-2023]].

Grandinetti, J. (2021). Examining embedded apparatuses of AI in Facebook and TikTok. *AI & SOCIETY*. https://doi.org/10.1007/s00146-021-01270-5

Grant, J., & Fox, F. (1992). Understanding the role of the designer in society. *Journal of Art & Design Education*, *11*(1), 77–87.

Hajli, M. N. (2014). A study of the impact of social media on consumers. *International Journal of Market Research*, *56*(3), 387–404. https://doi.org/10.2501/ijmr-2014-025

Harrigan, P., Daly, T. M., Coussement, K., Lee, J. A., Soutar, G. N., & Evers, U. (2021). Identifying influencers on social media. *International Journal of Information Management*, *56*, 102246. https://doi.org/10.1016/j.ijinfomgt.2020.102246

Hastie, T., Tibshirani, R., & Friedman, J. H. (2009). *The elements of statistical learning: Data mining, inference, and prediction* (2nd ed.). Springer.

Hebert, A., Hernandez, A., Perkins, R., Puig, A., Tressler, C., & Kreidler, J. (2021). Consumer advice [Accessed: January 12, 2023]. https://consumer.ftc.gov/

Hern, A. (2021). Facebook leak underscores strategy to operate in repressive regimes [Accessed: January 11, 2023]. https://www.%20theguardian.%20com/technology/2021/mar/23/facebook-leak-underscore-strategy-operate-repressive-regimes

Holland, G., & Tiggemann, M. (2016). A systematic review of the impact of the use of social networking sites on body image and disordered eating outcomes. *Body image*, *17*, 100–110. https://doi.org/10.1016/j.bodyim.2016.02.008

Howard, P. N., & Parks, M. R. (2012). Social media and political change: Capacity, constraint, and consequence. *Journal of Communication*, *62*(2), 359–362. https://doi.org/10.1111/j.1460-2466.2012.01626.x

Howard, Z., & Melles, G. (2011). Beyond designing: Roles of the designer in complex design projects. *Proceedings of the 23rd Australian Computer-Human Interaction Conference*, 152–155.

Huang, G. C., Unger, J. B., Soto, D., Fujimoto, K., Pentz, M. A., Jordan-Marsh, M., & Valente, T. W. (2014). Peer influences: The impact of online and offline friendship networks on adolescent smoking and alcohol use. *Journal of Adolescent Health*, *54*(5), 508–514. https://doi.org/10.1016/j.jadohealth.2013.07.001

Huda, M. (2022). Towards an adaptive ethics on social networking sites (SNS): A critical reflection. *Journal of Information, Communication and Ethics in Society*, *20*(2), 273–290. https://doi.org/https://doi.org/10.1108/JICES-05-2021-0046

Hugl, U. (2011). Reviewing person's value of privacy of online social networking. *Internet Research*, *21*(4), 384–407. https://doi.org/10.1108/10662241111158290

Hull, G., Lipford, H. R., & Latulipe, C. (2011). Contextual gaps: Privacy issues on facebook. *Ethics and Information Technology*, *13*(4), 289–302. https://doi.org/10.1007/s10676-010-9224-8

Hwang, K. O., Ottenbacher, A. J., Green, A. P., Cannon-Diehl, M. R., Richardson, O., Bernstam, E. V., & Thomas, E. J. (2010). Social support in an internet weight loss community. *International Journal of Medical Informatics*, *79*(1), 5–13. https://doi.org/10.1016/j.ijmedinf.2009.10.003

Ikeda, S. (2021). TikTok faces barrage of new complaints from EU consumer protection groups [Accessed: January 8, 2023]. https://www.cpomagazine.com/data-privacy/tiktok-faces-barrage-of-new-complaints-from-eu-consumer-protection-groups/

Isaak, J., & Hanna, M. J. (2018). User data privacy: Facebook, Cambridge Analytica, and privacy protection. *Computer*, *51*(8), 56–59. https://doi.org/10.1109/mc.2018.3191268

Iyengar, R. (2020). This is what it's like when a country actually bans TikTok [Accessed: January 8, 2023]. from%20https://edition.cnn.com/2020/08/13/tech/tiktok-ban-trump-india/index.html

Jain, A. K., Mao, J., & Mohiuddin, K. M. (1996). Artificial neural networks: A tutorial. *Computer*, *29*(3), 31–44. https://doi.org/10.1109/2.485891

Jarboe, G. (2021). How Instagram's Algorithm Works & IG Content Best Practices [Accessed: December 27, 2022]. https://www.searchenginejournal.com/instagram-algorithm-best-practices/264155/#close

Jia, H., & Xu, H. (2016). Autonomous and interdependent: Collaborative privacy management on social networking sites. *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*, 4286–4297.

Jibilian, I. (2020). Facebook is changing its 'race-blind' hate speech algorithm to prioritize flagging content it deems 'the worst of the worst,' after backlash over removing Black users' posts [Accessed: January 11, 2022]. https://www.businessinsider.com/facebook-worst-hate-speech-anti-black-race-blind-algorithm-zuckerberg-2020-12?r=US&IR=T

Jimenez, S., Pohlmeyer, A., & Desmet, P. (2015). *Positive design reference guide*. Delft University of Technology.

Jordan, M. I., & Mitchell, T. M. (2015). Machine learning: Trends, perspectives, and prospects. *Science*, *349*(6245), 255–260. https://doi.org/10.1126/science.aaa8415

Kaelbling, L. P., Littman, M. L., & Moore, A. W. (1996). Reinforcement learning: A survey. *Journal of Artificial Intelligence Research*, *4*, 237–285. https://doi.org/10.1613/jair.301

Kalinin, V., & Edguer, N. (2023). The effects of self-control and self-awareness on social media usage, self-esteem, and affect. *Eureka*, *8*(1). https://doi.org/10.29173/eureka28781

Kaplan, A. M., & Haenlein, M. (2010). Users of the world, unite! the challenges and opportunities of social media. *Business horizons*, *53*(1), 59–68. https://doi.org/10.1016/j.bushor.2009.09.003

Kara, N., Çubukçuoğlu, B., & Elçi, A. (2020). Using social media to support teaching and learning in higher education: An analysis of personal narratives. *Research in Learning Technology*, *28*. https://doi.org/10.25304/rlt.v28.2410

Kawulich, B. B., et al. (2005). Participant observation as a data collection method. *Forum qualitative sozialforschung/forum: Qualitative social research*, *6*(2).

Kent, M. L. (2010). Directions in social media for professionals and scholars. In R. Heath (Ed.), *Handbook of Public Relations* (2nd ed., pp. 643–656). SAGE Publications.

Kietzmann, J. H., Hermkens, K., McCarthy, I. P., & Silvestre, B. S. (2011). Social media? Get serious! Understanding the functional building blocks of social media. *Business Horizons*, *54*(3), 241–251. https://doi.org/10.1016/j.bushor.2011.01.005

Kirschner, P. A., & Norman, D. (2021). The teaching and learning of design [Accessed: June 30, 2023]. https://www.kirschnered.nl/2021/04/18/the-teaching-and-learning-of-design/

Kross, E., Verduyn, P., Demiralp, E., Park, J., Lee, D. S., Lin, N., Shablack, H., Jonides, J., & Ybarra, O. (2013). Facebook use predicts declines in subjective well-being in young adults. *PloS ONE*, *8*(8), e69841. https://doi.org/10.1371/journal.pone.0069841

Kühl, N., Goutier, M., Hirt, R., & Satzger, G. (2020). Machine learning in artificial intelligence: Towards a common understanding. *Proceedings of the Annual Hawaii International Conference on System Sciences*. https://doi.org/10.24251/hicss.2019.630

Lada, A., Wang, M., & Yan, T. (2021). *How does news feed predict what you want to see* [Accessed: December 25, 2022].

Lately. (n.d.). Lately AI social media post generator [Accessed: December 30, 2022]. https://www.lately.ai/

LeCun, Y., Bengio, Y., & Hinton, G. (2015). Deep learning. *Nature*, *521*(7553), 436–444. https://doi.org/10.1038/nature14539

Lewis, D., & Moorkens, J. (2020). A rights-based approach to trustworthy AI in social media. *Social Media+ Society*, *6*(3). https://doi.org/10.1177/2056305120954672

Linkfluence. (n.d.). Linkfluence L Consumer Insights [Accessed: December 30, 2022]. https://www.linkfluence.com/?hsLang=en

Livingstone, S., & Brake, D. R. (2010). On the rapid rise of social networking sites: New findings and policy implications. *Children & Society*, *24*(1), 75–83. https://doi.org/10.1111/j.1099-0860.2009.00243.x

Lua, A. (2023). The Big List of 25 Top Social Media Management Tools That'll Help You Succeed on Social Media — buffer.com [[Accessed 16-Jun-2023]].

Manzini, E. (2007). Design research for sustainable social innovation. In *Design research now: Essays and selected projects* (pp. 233–245). DE GRUYTER.

Mayring, P. (2015). Qualitative content analysis: Theoretical background and procedures. *Approaches to qualitative research in mathematics education: Examples of methodology and methods*, 365–380.

McQuail, D. (2010). *McQuail's mass communication theory* (6th ed.). SAGE publications.

Meaker, M. (2019). How typos, acronyms, and code words are making it difficult to monitor hate speech online. [Accessed: January 10, 2023]. https://psmag.com/ideas/neo-nazi-hate-speech-foiling-algorithms

Menon, D., & Meghana, H. (2021). Unpacking the uses and gratifications of Facebook: A study among college teachers in India. *Computers in Human Behavior Reports*, *3*, 100066. https://doi.org/10.1016/j.chbr.2021.100066

Meta. (2021). How Does News Feed Work? Episode 3 of Let Me Explain Has Answers. [Accessed: December 25, 2022]. https://www.facebook.com/business/news/let-me-explain-video-series-how-does-news-feed-work

Meta. (2022). Meta Reports Third Quarter 2022 Results [Accessed: December 25, 2022]. https://investor.fb.com/investor-news/press-release-details/2022/Meta-Reports-Third-Quarter-2022-Results/default.aspx

Meta. (2023). Facebook Community Standards | Transparency Center [Accessed: 19-Jun-2023]. https://transparency.fb.com/policies/community-standards/hate-speech/

Meta AI. (2022). The new AI-powered feature designed to improve Feed for everyone [Accessed: December 25, 2022]. https://ai.facebook.com/blog/facebook-feed-improvements-ai-show-more-less/

Mihalcik, C. (2020). Facebook's hate speech detection systems to focus on 'worst of the worst' [Accessed: January 11 2023]. https://www.cnet.com/tech/mobile/facebooks-hate-speech-detection-systems-to-focus-on-worst-of-the-worst-report-says/

Miller, D., Sinanan, J., Wang, X., McDonald, T., Haynes, N., Costa, E., Spyer, J., Venkatraman, S., & Nicolescu, R. (2016). *How the world changed social media*. UCL press.

Mitchell, T. M. (1997). *Machine learning*. McGraw-Hill.

Morin, A. (2011). Self-awareness part 1: Definition, measures, effects, functions, and antecedents. *Social and Personality Psychology Compass*, *5*(10), 807–823. https://doi.org/10.1111/j.1751-9004.2011.00387.x

Nagulendra, S., & Vassileva, J. (2016). Providing awareness, explanation and control of personalized filtering in a social networking site. *Information Systems Frontiers*, *18*(1), 145–158. https://doi.org/10.1007/s10796-015-9577-y

Newton, C. (2019). The trauma floor: The secret lives of Facebook moderators in America [Accessed: January 10, 2023]. https://www.theverge.com/2019/2/25/18229714/cognizant-facebook-content-moderator-interviews-trauma-working-conditions-arizona

Newton, C. (2020). Three takeaways from a visit to TikTok's new transparency center [Accessed: January 8, 2023]. https://www.theverge.com/interface/2020/9/11/21430822/tiktok-transparency-visit-tour-algorithms-for-you-page

Nilsson, N. J. (1998). *Artificial intelligence: A new synthesis*. Morgan Kaufmann Publishers.

Nissenbaum, H. (2004). Privacy as contextual integrity. *Washington Law Review*, *79*, 101–139.

Norman, D., & Nielsen, J. (2006). The Definition of User Experience (UX) [Accessed: January 11, 2023]. https://www.nngroup.com/articles/definition-user-experience/

Nti, I. K., Adekoya, A. F., Weyori, B. A., & Nyarko-Boateng, O. (2022). Applications of artificial intelligence in engineering and manufacturing: A systematic review. *Journal of Intelligent Manufacturing*, *33*(6), 1581–1601. https://doi.org/10.1007/s10845-021-01771-6

Oberst, U., Wegmann, E., Stodt, B., Brand, M., & Chamarro, A. (2017). Negative consequences from heavy social networking in adolescents: The mediating role of fear of missing out. *Journal of Adolescence*, *55*(1), 51–60. https://doi.org/10.1016/j.adolescence.2016.12.008

O'Keeffe, G. S., Clarke-Pearson, K., & Council on Communications and Media. (2011). The impact of social media on children, adolescents, and families. *Pediatrics*, *127*(4), 800–804. https://doi.org/10.1542/peds.2011-0054

Omar, B., & Dequan, W. (2020). Watch, share or create: The influence of personality traits and user motivation on TikTok mobile video usage. *International Journal of Interactive Mobile Technologies (IJIM)*, *14*(04), 121–137. https://doi.org/10.3991/ijim.v14i04.12429

Owen, L. H. (2020). Facebook will spend less time policing "Men are trash" content, more time taking down "Worst of the Worst" [Accessed: January 26, 2023]. https://www.niemanlab.org/2020/12/facebook-will-spend-less-time-policing-men-are-trash-content-more-time-taking-down-worst-of-the-worst/

Palen, L., & Dourish, P. (2003). Unpacking "privacy" for a networked world. *Proceedings of the Conference on Human Factors in Computing Systems - CHI '03*, *5*(1), 129–136. https://doi.org/10.1145/642611.642635

Pannu, A. (2015). Artificial intelligence and its application in different areas. *Artificial Intelligence*, *4*(10), 79–84.

Parrish, J. L. (2010). Papa knows best: Principles for the ethical sharing of information on social networking sites. *Ethics and Information Technology*, *12*, 187–193.

Pattern89. (2021). Marketing AI to predict creative performance [Accessed: December 31, 2022,]. https://www.pattern89.com/

Patterson, M. (2023). A beginner's guide to social media marketing tools — sproutsocial.com [[Accessed 16-Jun-2023]].

Persado. (2022). Motivation AI platform that drives revenue lift [Accessed: December 30, 2022]. https://www.persado.com/platform/

Phrasee. (2022). AI-powered content platform for enhanced customer experience [Accessed: December 31, 2022]. https://phrasee.co/

Pouwels, J. L., Valkenburg, P. M., Beyens, I., van Driel, I. I., & Keijsers, L. (2021). Social media use and friendship closeness in adolescents' daily lives: An experience sampling study. *Developmental Psychology*, *57*(2), 309–323. https://doi.org/10.1037/dev0001148

Przybylski, A. K., Murayama, K., DeHaan, C. R., & Gladwell, V. (2013). Motivational, emotional, and behavioral correlates of fear of missing out. *Computers in Human Behavior*, *29*(4), 1841–1848. https://doi.org/10.1016/j.chb.2013.02.014

Putnam, R. D. (2000). *Bowling alone: The collapse and revival of American community*. Simon & Schuster Paperbacks.

Raacke, J., & Bonds-Raacke, J. (2008). Myspace and facebook: Applying the uses and gratifications theory to exploring friend-networking sites. *CyberPsychology & Behavior*, *11*(2), 169–174. https://doi.org/10.1089/cpb.2007.0056

Rasheed, M. I., Malik, M. J., Pitafi, A. H., Iqbal, J., Anser, M. K., & Abbas, M. (2020). Usage of social media, student engagement, and creativity: The role of knowledge sharing behavior and cyberbullying. *Computers & Education*, *159*, 104002. https://doi.org/10.1016/j.compedu.2020.104002

Richards, D., Caldwell, P. H., & Go, H. (2015). Impact of social media on the health of children and young people. *Journal of Paediatrics and Child Health*, *51*(12), 1152–1157. https://doi.org/10.1111/jpc.13023

Rodrigues, A. P., Fernandes, R., Shetty, A., Lakshmanna, K., Shafi, R. M., et al. (2022). Real-time Twitter spam detection and sentiment analysis using machine learning and deep learning techniques. *Computational Intelligence and Neuroscience*, 1–14. https://doi.org/10.1155/2022/5211949

Roller, S., Weston, J., & Dinan, E. (2020). A state-of-the-art open source chatbot [Accessed: December 29, 2022]. https://ai.facebook.com/blog/state-of-the-art-open-source-chatbot/

Russell, S. J., & Norvig, P. (2010). *Artificial intelligence: A modern approach* (4th ed.). Pearson Education, Inc.

Russmann, U., & Svensson, J. (2016). Studying organizations on Instagram. *Information*, *7*(4), 58. https://doi.org/10.3390/info7040058

Saldaña, J. (2011). *Fundamentals of qualitative research*. Oxford university press.

Sankar, S., & Makhani, A. (2014). Did you mean "Galene"? [Accessed: December 26, 2022,]. https://engineering.linkedin.com/search/did-you-mean-galene.

Saraco, F. (2022). How the Instagram algorithm works in 2022 [Accessed: December 27, 2022]. https://www.shopify.com/blog/instagram-algorithm

Satterfield, S. (2020). Personalized advertising and privacy are not at odds [Accessed: January 9, 2023]. https : / / about . fb . com / news / 2020 / 12 / personalized - advertising-and-privacy-are-not-at-odds/

Schensul, J. J., & LeCompte, M. D. (2012). *Essential ethnographic methods: A mixed methods approach* (Vol. 3). Rowman Altamira.

Schmidt, T. S. (2006). Inside the Backlash Against Facebook [Accessed: January 5, 2023]. https://content.time.com/time/nation/article/0,8599,1532225,00.html

Seabrook, E. M., Kern, M. L., & Rickard, N. S. (2016). Social networking sites, depression, and anxiety: A systematic review. *JMIR Mental Health*, *3*(4), e5842. https://doi.org/10.2196/mental.5842

SEO North Agency. (2019). Social Media Safety Tips — youtube.com [[Accessed 16-Jun-2023]].

Shanahan, J. (2000). Machine learning. *Soft Computing for Knowledge Discovery*, 143–175. https://doi.org/10.1007/978-1-4615-4335-0_7

Sharma, R., Kamble, S. S., Gunasekaran, A., Kumar, V., & Kumar, A. (2020). A systematic literature review on machine learning applications for sustainable agriculture supply chain performance. *Computers & Operations Research*, *119*, 1–17. https://doi.org/10.1016/j.cor.2020.104926

Shinde, P. P., & Shah, S. (2018). A review of machine learning and deep learning applications. *2018 Fourth international conference on computing communication control and automation (ICCUBEA)*, 1–6. https://doi.org/10.1109/iccubea.2018.8697857

Shuster, K., Xu, J., Komeili, M., Ju, D., Smith, E. M., Roller, S., Ung, M., Chen, M., Arora, K., Lane, J., Behrooz, M., Ngan, W., Poff, S., Goyal, N., Szlam, A., Boureau, Y.-L., Kambadur, M., & Weston, J. (2022). Blenderbot 3: A deployed conversational agent that continually learns to responsibly engage [Accessed: December 30, 2022]. https://arxiv.org/abs/2208.03188v1

Siang, T. (2023). What is interaction design? [Accessed: January 11, 2022].

Siapera, E., & Viejo-Otero, P. (2021). Governing hate: Facebook and digital racism. *Television & New Media*, *22*(2), 112–130. https://doi.org/10.1177/1527476420982232

Siddiqui, S., & Singh, T. (2016). Social media its impact with positive and negative aspects. *International Journal of Computer Applications Technology and Research*, *5*(2), 71–75. https://doi.org/10.7753/ijcatr0502.1006

Silvia, P. J., & O'Brien, M. E. (2004). Self-awareness and constructive functioning: Revisiting "the human dilemma". *Journal of Social and Clinical Psychology*, *23*(4), 475–489. https://doi.org/10.1521/jscp.23.4.475.40307

Solove, D. J. (2006). A taxonomy of privacy. *University of Pennsylvania Raw review*, *154*(3), 477–564. https://doi.org/10.2307/40041279

Sonderby, C. (2020). Our Continuing Commitment to Transparency [Accessed: January 7, 2023]. https://about.fb.com/news/2020/11/biannual-transparency-report/

Spradley, J. P. (1980). *Participant observation*. Waveland Press.

SproutSocial. (n.d.). Sprout Social: Social Media Management Solutions [Accessed: December 30, 2022]. https://sproutsocial.com/

Stefano, A. (2022). AI in social media: How algorithms redefine online spaces [Accessed: December 28, 2022]. https://www.itransition.com/ai/social-media

Tech Transparency Project. (2020). White supremacist groups are thriving on Facebook [Accessed: January 10, 2023]. https://www.techtransparencyproject.org/sites/default/files/Facebook-White-Supremacy-Report.pdf

Technology Services at Illinois. (2016). Social Media Data Privacy Awareness [Accessed: January 12, 2023]. https://www.youtube.com/watch?v=UhhYSrUHnao

Thorne, S. (2000). Data analysis in qualitative research. *Evidence-based nursing*, *3*(3), 68–70.

Thulasi, S. (2019). Understand why you're seeing certain ads and how you can adjust your ad experience-about facebook [Accessed: January 9, 2023]. https://about.fb.com/news/2019/07/understand-why-youre-seeing-ads/

Tiggemann, M., & Slater, A. (2013). NetGirls: The internet, Facebook, and body image concern in adolescent girls. *International Journal of Eating Disorders*, *46*(6), 630–633.

TikTok. (2020). How TikTok recommends videos #ForYou [Accessed: January 8, 2023]. https://newsroom.tiktok.com/en-us/how-tiktok-recommends-videos-for-you

Tracy, J. L., & Randles, D. (2011). Four models of basic emotions: A review of ekman and cordaro, izard, levenson, and panksepp and watt. *Emotion review*, *3*(4), 397–405.

Tubaro, P., Casilli, A. A., & Coville, M. (2020). The trainer, the verifier, the imitator: Three ways in which human platform workers support artificial intelligence. *Big Data & Society*, *7*(1). https://doi.org/10.1177/2053951720919776

Tubik. (2017). Social Network Design: UX for Communication. — uxplanet.org [[Accessed 16-Jun-2023]].

Turculeţ, M. (2014). Ethical issues concerning online social networks. *Procedia-Social and Behavioral Sciences*, *149*, 967–972. https://doi.org/10.1016/j.sbspro.2014.08.317

Turing, A. M. (1950). I.—Computing Machinery and Intelligence. *Mind*, *59*(236), 433–460. https://doi.org/10.1093/mind/LIX.236.433

Turkle, S. (2011). *Alone together: Why we expect more from technology and less from each other*. Basic Books.

Twenge, J. M., Spitzberg, B. H., & Campbell, W. K. (2019). Less in-person social interaction with peers among US adolescents in the 21st century and links to loneliness. *Journal of Social and Personal Relationships*, *36*(6), 1892–1913. https://doi.org/10.1177/0265407519836170

UK National Cyber Security Centre. (2019). Social Media: How to use it safely — ncsc.gov.uk [[Accessed 16-Jun-2023]].

Utz, S., & Beukeboom, C. J. (2011). The role of social network sites in romantic relationships: Effects on jealousy and relationship happiness. *Journal of Computer-Mediated Communication*, *16*(4), 511–527. https://doi.org/10.1111/j.1083-6101.2011.01552.x

Valkenburg, P. M., & Peter, J. (2009). The effects of instant messaging on the quality of adolescents' existing friendships: A longitudinal study. *Journal of Communication*, *59*(1), 79–97. https://doi.org/10.1111/j.1460-2466.2008.01405.x

Valkenburg, P. M., & Peter, J. (2011). Online communication among adolescents: An integrated model of its attraction, opportunities, and risks. *Journal of Adolescent Health*, *48*(2), 121–127. https://doi.org/10.1016/j.jadohealth.2010.08.020

Vallor, S. (2012). Social Networking and Ethics [Accessed: January 1, 2023]. In E. N. Zalta & U. Nodelman (Eds.), *The Stanford Encyclopedia of Philosophy*. Metaphysics Research Lab, Stanford University. https://plato.stanford.edu/entries/ethics-social-networking/.

Ventura, J. (2011). The industrial designer as mediator and semiotic translator: Mediating client's and user's needs. *Design Principles and Practices: An International Journal*, *5*(5), 73–80.

Verduyn, P., Ybarra, O., Résibois, M., Jonides, J., & Kross, E. (2017). Do social network sites enhance or undermine subjective well-being? A critical review. *Social Issues and Policy Review*, *11*(1), 274–302. https://doi.org/10.1111/sipr.12033

Wakefield, J. (2021). AI: Ghost workers demand to be seen and heard [Accessed: January 10, 2023]. https://www.bbc.com/news/technology-56414491

Wang, H., Ma, C., & Zhou, L. (2009). A brief review of machine learning and its application, 1–4. https://doi.org/10.1109/iciecs.2009.5362936

Wang, S.-C. (2003). Artificial neural network. In *Interdisciplinary Computing in Java Programming* (pp. 81–100). Springer Science & Business Media. https://doi.org/10.1007/978-1-4615-0377-4_5

Winston, P. H. (1992). The intelligent computer. In *Artificial Intelligence* (3rd ed., pp. 5–14). Addison-Wesley.

WordStream. (2022). Online advertising made easy [Accessed: December 31, 2022]. https://www.wordstream.com/

Wu, T., Liu, S., Zhang, J., & Xiang, Y. (2017). Twitter spam detection based on deep learning. *Proceedings of the Australasian Computer Science Week Multiconference*, 1–8. https://doi.org/10.1145/3014812.3014815

Young, S. D., & Jordan, A. H. (2013). The influence of social networking photos on social norms and sexual health behaviors. *Cyberpsychology, Behavior, and Social Networking*, *16*(4), 243–247. https://doi.org/10.1089/cyber.2012.0080

Zhu, Y.-Q., & Chang, J.-H. (2016). The key role of relevance in personalized advertisement: Examining its impact on perceptions of privacy invasion, self-awareness, and continuous use intentions. *Computers in Human Behavior*, *65*, 442–447. https://doi.org/10.1016/j.chb.2016.08.048