AI Technologies in the Media and a Techno-Determinist Inquiry: German News Media and Audience Perspective

Abstract

This study aims to analyze artificial intelligence-related news featured in the media and the comments made by target audiences on these news articles or similar AI-related content. It seeks to critically examine how developments in artificial intelligence are received in news articles and user-generated content, the topics they are associated with, and the general attitudes toward technological advancements, particularly robotic technologies, within the framework of the "Computers Are Social Actors" (CASA) paradigm. Through this approach, the study will question the technological determinist perspective reflected in the news media and user comments. The research is planned to be conducted between July 1, 2025, and September 1, 2025, at the University of Bonn, Germany. As part of the study, two German news platforms, *deutschland.de* and *Deutsche Welle*, along with their respective news articles, have been selected as the sample. News articles of these news platforms are planned to be collected from these platforms, which will be analyzed using content and descriptive techniques. The collected data will be coded, visualized, and mapped using the MAXQDA Qualitative Data Analysis software. The anticipated outcome of this research is to reveal the technological determinist perspective prevalent in news media and user comments and to provide a communicative analysis of attitudes toward technological advancements.

Keywords: Artificial Intelligence, Technological Determinism, CASA, News Media, User-Generated Content, MAXQDA

Introduction and Theoretical Framework

Integrating artificial intelligence (AI) technologies into all areas of life is accelerating at an unstoppable pace. AI-driven innovations are increasingly shaping social life from education to healthcare, economics to law, and agriculture to communication systems. Technology, in general, and AI tools and practices, in particular, are transforming cultural phenomena and interactions. New concepts, perspectives, and debates are emerging across all scientific disciplines in light of these advancements. While technological determinism has been a subject of academic discussion for a long time, new scientific claims and approaches are evolving. Within this context, the relatively recent critical "Computers Are Social Actors" (CASA) paradigm has emerged at both a critical and diagnostic trajectory (Fortunati & Edwards, 2020; Fortunati, Cavallo, & Sarrica, 2020; Gambino et al., 2020; Heyselaar, 2023; Hepp et al., 2024). This study adopts the CASA paradigm and its critique as a fundamental theoretical framework, evaluating it through technological determinism.

Technological determinist approaches frame relationships, cultural activities, and disciplines such as politics, economics, and communication through a technological lens, positioning technology at the center of these domains. Technological determinism (TD) is, simply put, the idea that technology has significant impacts on our lives. This notion is prominently reflected in popular imagination and political rhetoric, such as the claim that the internet has revolutionized the economy and society (Adler, 2008). Robert Heilbroner's essay "Do Machines Make History?"—first published in Technology and Culture in 1967—argues that examining the presence of machines in a society is a good starting point for understanding that society, as it defines what it is like to live in a specific place and time (1994, pp. 69–70). He presents this not as a normative prescription but as a heuristic method for research. According to Wyatt (2008, p. 167), technological determinism persists in the actions taken and justifications given by many actors; it persists in analysts' use of it to make sense of the introduction of technology in a variety of social settings; it persists in manifold theoretical and abstract accounts of the relationship between the technical and the social; it persists in the responses of policy makers and politicians to

challenges about the need for or appropriateness of new technologies; and it persists in the reactions we all experience when confronted with new machines and new ways of doing things.

Technological determinism is based on the assumption that technology possesses an "autonomous" or independent logic—a core "essence" that can be explained without reference to social contexts. Technology is considered social only in terms of the purposes it serves. This perspective has two main components:

- Technological change follows a linear trajectory from simple designs to more complex ones, progressing through distinct stages.
- Social institutions adapt to the forms imposed by technological change.

Modern industrial technology and its products have shaped corresponding social institutions, effectively creating a universal civilization (Kuban, 1999, p. 183).

According to Smith and Marx (1994, p. XI) "Technology" or terms like "the machine" are used an active agents in determinist perspective: "The automobile created suburbia," "The atomic bomb removed Congress's power to declare war," "The mechanical cotton-picker spurred migration of Black farm workers to northern cities," "Robots displaced riveters," and "The Pill led to a sexual revolution." Each phrase portrays a complex event as an inevitable result of technological progress, suggesting that these innovations have lasting, cumulative, and interlinked social impacts. Dafoe (2015, 1052), analytically separate a number of distinct claims related to technological determinism. The family of claims include the views that: (1) functional entities (artifacts, techniques, institutions, and systems) exert an effect on the world independent of human choice (technical determinism); (2) there is a broad sequence and tempo of scientific and technological advance (technological trends) that seems to follow an internal logic, making technological change seem autonomous; and (3) that people are insufficiently conscious of their technological choices (technological somnambulism) or have been co-opted (the magnificent bribe), such that the social order is becoming more machine-like over time.

A more recent critical approach that questions technological determinism through human-machine communication is the “Computers Are Social Actors” (CASA) perspective (Reeves & Nass, 1996; Höflich, 2013; Fortunati, Cavallo & Sarrica, 2020: Fortunati & Edwards, 2020).

Reeves and Nass (1996) argue that humans' "old brain" lacks an advanced mechanism to differentiate communication mediated by technology from its real-life counterparts. When technology-mediated representations mimic real life, people respond to them naturally and unconsciously. These responses are based on prior experiences of social interaction. Thus, even when individuals know that computers are not human, they make judgments and inferences as if they were. People recognize that media agents and social robots are semi-interlocutors, semi-communicators, and semi-social entities; however, they "play along" and act as if they are genuinely communicating and forming social relationships with them (Fortunati & Edwards, 2020, p. 9). Höflich proposes to widen the usual dyadic model of human-robot interaction with a triadic model, which considers social robots to be mediators “between two persons or between a person and his or her environment” [2013, p. 36]. Such a triadic model implicitly accords to social robots the status of a real or imagined “other,” which can shape humans’ perception of the environment, including other human beings or themselves. The more social robots live within human societies, the more they will become hybrid, as they will include artificial agents (Fortunati, Cavallo & Sarrica, 2020).

In their research, Nass, Steuer, and Tauber (1994) state that they conducted an experimental study on CASA. Five experiments provide evidence that individuals’ interactions with computers are fundamentally social. The studies show that social responses to computers do not result from conscious beliefs that computers are human or human-like. Moreover, such behaviors do not result from users’ ignorance of psychological or social dysfunctions or a belief that subjects are interacting with programmers. Instead, social responses to computers are commonplace and easy to generate. According to Heyselaar (2023, p. 1), the Computers Are Social Actors (CASA) theory, a cornerstone of human-

computer interaction, posits that humans interact with computers as if they are humans, shaping the design of chatbots, robots, and virtual agents. However, this theory, rooted in the early 1990s, may no longer apply universally. Her study reveals that participants no longer engage with desktop computers as human-like entities, suggesting that CASA Theory might be limited to emergent technologies, a key consideration for future human-computer interaction research and design.

Gambino et al. have also been critical of CASA. According to writers (Gambino, Fox & Ratan, 2020) the computers are social actors framework (CASA), derived from the media equation, explains how people communicate with media and machines demonstrating social potential. Whereas CASA suggests humans mindlessly apply human-human social scripts to interactions with media agents, we argue that humans may develop and apply human-media social scripts to these interactions.

As evident from the theoretical framework discussed so far, the perspective of technological determinism establishes a close connection between societal life and technology, asserting that technology possesses an autonomous power to drive social transformations. In this research design, however, the "Computers Are Social Actors" (CASA) perspective, considered a newer and more comprehensive approach, will serve as the primary theoretical framework. CASA is particularly relevant for analyzing critiques of contemporary AI and autonomous systems. This study adopts the CASA framework due to its focus on human-machine interaction and its ability to provide critical perspectives with recent CASA studies. The research will examine how AI technologies and advancements in human-machine communication are conceptualized and expressed in German news media and audience-generated content within this context. Specifically, the study aims to identify the perspectives and concepts reflected in news articles and user-driven content related to AI communication.

To ensure methodological coherence, CASA is expected to serve as a foundation for understanding techno-determinist viewpoints in AI-themed news and the audience's perceptions of robotic technologies. A descriptive and content-based analysis of German media discourse and audience-generated content will be conducted. Human-robot communication, referred to as AI-mediated communication, will be critically examined through the approaches presented by CASA. Finally, the study will aim to present how much the findings align with or diverge from the CASA and critical CASA perspectives.

Literature Review and Problem of the Study

O'Regan (2012, p. 229), a researcher in the field of artificial intelligence (AI) technologies, describes the ultimate goal of AI research as the creation of intelligent, conscious, self-learning machines equipped with autonomy and moral reasoning. From this perspective, it is evident that the aim is to endow machines with human-like qualities. Alan Turing, one of the pioneering scientists in this field, connected the seemingly disparate workings of the human brain and machines, demonstrating the possibility of multiple and alternative perspectives. This also opens the door to envisioning a different type of social organization and its accompanying imaginations (Copeland, 2014, p. 198; Topal, 2017, p. 1351).

It is possible to encounter a comprehensive body of literature examining the increasing use, representation, and effects of artificial intelligence technologies and robot software in communication and media. In his study, Clerwall (2014, p. 519) had participants read news articles written by a robot journalist and a human journalist and asked them questions about how they perceived these articles. While this study focused on automated content, it did not approach this automation from the perspective of technological determinism.

Lewis et al. (2019) discuss human-machine communication and its potential professional and technological implications, focusing on AI-driven tools such as chatbots, social bots, and other communication intermediaries enabled by advancements in artificial intelligence (AI). The study explores topics such as the assumption of human roles by machines, the evolving identity of the

communicator, the establishment of social relationships through exchanges between humans and machines, and the novel implications of these processes for concepts like self, society, and communication. In this regard, the research focuses on the societal consequences of AI technology through the lens of the journalism profession.

Wu et al. (2019) investigated the extent to which technology firms impose their logic on journalism and how traditional journalism has been transformed as a result. Based on data gathered through interviews with leading companies in the field of data science, the study examined the influence and dominance of technological principles and practices on journalism. However, the research did not provide an analysis of news media practices mediated by AI or technological determinism.

In one study, Kirley (2016, p. 29) examines the policies of the EU and the US regarding how robotics and other technologies can be regulated by law. Linden and Dierickx (2019, p. 153) conducted a quantitative analysis of 300 news articles published in English and French between 2010 and 2017, focusing on the term "robot journalism." Their findings show that terms such as "artificial intelligence," "algorithm," "software," and "robot journalism" appeared in more than three-quarters of the articles. In another study by Dierickx (2020, p. 432), the role of journalists' social representations and cultural practices in shaping the applications of news automation software in Belgium was explored. The study concluded that journalists need to enhance their technical knowledge and skills.

One of the most comprehensive studies in the literature examining human-AI interaction and communication on a theoretical level is Şenyüz's 2021 article. In this work, Şenyüz explores human-machine interaction (HMI) as both a concept and a field of study within communication sciences, questioning the effects of interactions between humans and technology on individuals, society, and humanity. This study provides a significant perspective for our research by explaining how humans are influenced by technology and how they behave towards technological devices. However, it does not directly address the approaches of news media through sample texts. In our research, the techno-deterministic approaches in news media and user comments will be analyzed directly.

According to Erdem (2021, p. 897), artificial intelligence (AI), inherent in high technologies that impact global life from micro to macro levels and create societal turning points, is one of the key components of Society 5.0, declared as the "super-smart society" of our time. As with all technological advancements in human history, AI powered by machine learning exhibits significant effects across various domains such as economics, communication, culture, and politics, leading to numerous studies exploring these impacts.

When examining the literature on the relationship between journalism and artificial intelligence, studies predominantly focus on how AI is technologically transforming the journalism profession and introducing new challenges and uncertainties regarding the employment of journalists. While there are studies specifically addressing the topic of technological determinism and media, it can be argued that there is a gap in research that simultaneously incorporates the approaches of news media and user-generated content. Existing studies on technological determinism often approach the subject differently from this research proposal, primarily focusing on the automation of news production processes. Therefore, the unique structure of this study lies in its examination of news media approaches and user comments within the framework and perspective of technological determinism.

In a study similar to the subject of this research, Winkel explored how the German news media frames AI technologies. The article conducted a discourse analysis of 113 articles from the German newspapers *Süddeutsche Zeitung* and *Frankfurter Allgemeine Zeitung*. The analysis revealed how center-left and center-right media frame AI developments from the perspectives of social and technological determinism. The article highlights the viewpoints on AI that German civil society encounters daily. However, this study did not include user comments in its analysis. In this respect, the current research proposal expands the scope of AI technology framing and presents a new approach by incorporating user-generated content into the analysis. Baltezarević (2024, p. 159) conducted a study

evaluating AI and technological determinism from an ethical perspective. The study analyzes the persistent discourse on technological determinism and its profound impact on the process of cultural change. Within a multidisciplinary context, it focuses on the transformative potential of new technologies, particularly AI, and their implications for cultural evolution and the preservation of human identity. However, this study does not consider the news framing of these issues.

Goldfus and Eder (2023, p. 1) argue in their article that AI is rooted in a deterministic worldview that conflicts with some of our most fundamental cultural narratives. According to them, AI-based decision-making systems not only reveal underlying patterns in the world but also create and reinforce these patterns to the detriment of the disadvantaged, exceptional, and improbable, turning predictions into self-fulfilling prophecies. The authors provide a profound and theoretical analysis of AI and determinism in their study. Unlike the reviewed literature, the primary focus of this research is to critically examine, within the framework of the CASA paradigm, how the German news media evaluates AI-driven technological developments, which conceptual themes and intellectual approaches it emphasizes, and how user-generated content reflects on AI developments. Specifically, it investigates whether such content emphasizes technology or develops intellectual perspectives on AI-centered advancements as a technological phenomenon.

Artificial intelligence (AI) technology can be seen as a technological advancement that determines and transforms social relations. Building on this perspective, this research aims to analyze how AI technology is evaluated in news texts and in audience participation processes. Specifically, it examines, from a techno-cultural and communicative standpoint, whether these evaluations adopt a technological determinist approach and, if so, which concepts and themes shape this perspective. The study is expected to offer valuable insights into identifying communicative strategies to address potential technological challenges that may arise in the future due to the automation of professional routines and its impact on social relationships. Since the operation of AI software may yield different results in various cultures while also producing some similarities, the findings of this research will explore the societal and technological future potentials of AI technologies, particularly in Germany and other advanced Western democracies, from the perspectives of technology, society, and automation.

Research Objective and Sub-Goals

This research aims to investigate how developments in AI technologies are framed in the news media, what positive and negative effects AI-centered advancements have on social relationships, and how technological determinist approaches are evaluated by the news media and its audience during such developments. Additionally, the study seeks to critique technological determinist perspectives within the framework of the CASA paradigm. In this context, several sub-objectives are outlined:

1. Linguistic and Schematic Analysis: The study aims to conduct a schematic and linguistic analysis of AI-centered developments by examining sample news texts from German news media.
2. Target Audience' Insights: To highlight positive and negative linguistic changes in AI-centered news, the impressions, evaluations, expectations, and solution proposals of the target audience will be identified and presented.
3. Impact of Automation on Society: To demonstrate the impact of AI-centered developments on the phenomenon of societal automation, user-generated content and audience participation practices will be analyzed.
4. Critical Evaluation of AI-related Developments: The positive and negative outcomes of AI-related developments will be presented thematically through a techno-determinist critique within the CASA paradigm, using semantic, visual, and statistical methods.

By doing so, the fundamental perspectives of the news media and its audience on AI developments, along with the formation of technological determinist approaches, will be revealed and critically

evaluated. Additionally, the approaches of the news media and the audience regarding potential cultural and social impacts, and the communication strategies that could be employed to address these challenges now and in the future, will be mapped via MAXQDA programme, visualized, and presented based on the findings.

Research Methodology

This study adopts a content and descriptive analysis approach for examining digital datasets obtained from predetermined samples. Utilizing digital datasets will facilitate achieving the second and third sub-objectives outlined in the study's goals. The research includes two types of datasets:

News Articles Dataset: The first dataset comprises news articles sourced from English-language news websites in Germany. A minimum of 100 news articles published between 2024 and 2025 will be collected and subjected to content and descriptive analysis. These articles will focus on terms such as "artificial intelligence," "robot technologies," "smart and autonomous systems," "machine learning," and "Internet of Things," reflecting the study's scope and limitations.

User Comments Dataset: The second dataset consists of user comments collected from social media accounts of English-language news websites. Platforms such as YouTube, X (formerly Twitter), and Instagram will be used to gather at least 500 user comments. During analysis, all usernames and account details will be anonymized to ensure the exclusion of personal data from the study.

The selected news websites are *deutschland.de* and *Deutsche Welle*. These platforms represent different perspectives: *deutschland.de* reflects the viewpoint of the *Federal Foreign Office*, while *Deutsche Welle* offers a more international perspective. These two sources are considered significant for conducting a comparative analysis. This method ensures a robust and systematic approach to analyzing how AI technologies are framed in German media and perceived by audiences, contributing to the study's overarching objectives.

Data Collection Tools and Sampling

The study will employ purposive sampling, a non-probabilistic sampling method. Purposive sampling allows for the selection of information-rich cases that align with the research objectives, enabling in-depth investigation (Büyüköztürk et al., 2018, pp. 90–91). This approach is suitable for the study's focus on specific criteria for sampling.

Two distinct types of samples and datasets are planned for this research. The first dataset consists of AI-centered news articles sourced from German news websites. These articles will be identified using specific keywords such as "artificial intelligence," "robotic software," "automation," "smart technologies," and "machine learning." A qualitative analysis tool, MAXQDA, with its web collector extension, will be used to collect these articles. Preliminary research indicates that sufficient data can be gathered using these conceptual queries. To ensure the analysis reflects recent trends, only articles published within the last year (2024–2025) will be included. The data collection process will involve filtering and cleaning the raw data through the web collector tool by inputting URLs of relevant news webpages. This will ensure that the dataset is pre-processed and ready for analysis.

The second dataset comprises user-generated content (comments) related to the AI-centered news articles. These comments will be gathered from social media platforms (e.g., YouTube, X, Instagram) linked to the identified news websites. The inclusion of user comments provides valuable insights into audience perspectives and interactions with AI-related developments.

The data collection process for the news articles involves using the web collector extension of MAXQDA to identify and collect relevant articles based on predefined keywords. The data will be cleaned and categorized before proceeding to the analysis stage. User comments will be sourced from social media platforms linked to the selected news websites, and ethical considerations such as anonymization of usernames and account details will be strictly adhered to during the collection and

analysis phases. This methodology ensures the collection of comprehensive and well-organized datasets, enabling a detailed analysis of AI-centered developments in German news media and audience responses.

In the study, user comments planned to constitute the second dataset will be collected by scanning the social media accounts of the same news platforms. In case the necessary and sufficient dataset cannot be obtained, the social media accounts of other German news television channels, newspapers, and news websites will also be subjected to a similar scan. For example, user comments on a YouTube video about artificial intelligence and robotic software can be easily collected as datasets. If the specified dataset is obtained through the YouTube platform, MAXQDA's "Import Data from YouTube" extension/tool will be used. This tool acts as a bridge between MAXQDA and YouTube, enabling the collection of user comments via the link of the specified news video. If the dataset is obtained through the X platform, MAXQDA's "Twitter Data" extension will be utilized to establish an API connection. This connection serves as a bridge between MAXQDA and the X platform, allowing the collection of user comments via both hashtags and specific accounts. It also enables specific queries to be conducted using particular terms. Another tool that facilitates data collection from the X platform is the TAGS platform. TAGS is a free Google Sheets template that allows automatic collection and execution of search results from Twitter (TAGS, 2022).

With the relevant keywords or phrases, it is possible to conduct searches on the X platform up to seven days into the past and on YouTube without any time restrictions. Through these searches, thousands of tweets, retweets, replies, or comments can be collected as data and saved in a format suitable for analysis. During the analysis, individual or account names will not be explicitly disclosed, and the privacy rights of the accounts will not be violated. The information will only be visible during the analysis process conducted within the program interface and will not be shared with third parties or individuals.

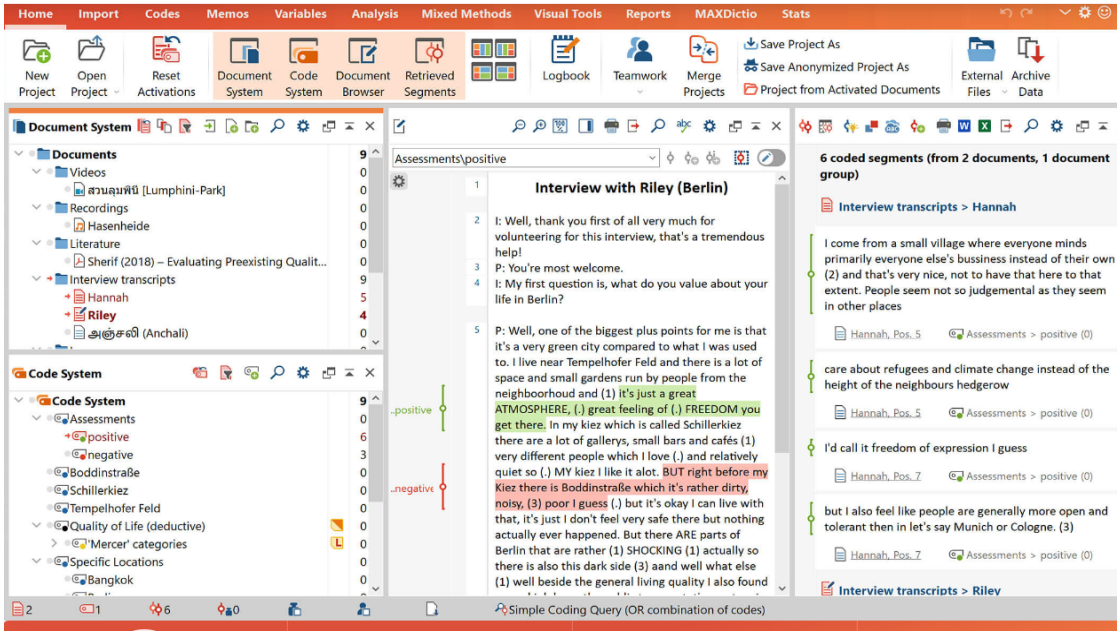
Data Analysis Technique

After the data collection process is completed, the datasets will be organized, and separate data files for each source will be coded and analyzed in-depth using the MAXQDA Qualitative Data Analysis Program. The collected data will undergo descriptive and content analysis in line with the research problem, questions, and defined objectives.

In the descriptive analysis approach, the data is summarized and interpreted according to predefined themes. These themes can be based on the research questions or the concepts and dimensions used during data collection. Descriptive analysis frequently includes direct quotations to vividly convey the perspectives of individuals observed or interviewed (Yıldırım & Şimşek, 2013, p. 256). In this respect, the descriptive analysis technique serves a supportive function by enabling conceptual, in-depth, and semantic analyses.

Qualitative content analysis is another analysis method that will be employed in this research. Studies using qualitative content analysis focus on the characteristics of language as communication by paying attention to the content or contextual meaning of the text (Hsieh & Shannon, 2005, p. 1278). Textual data can be in oral, written, or electronic forms and may include narrative responses, open-ended survey questions, interviews, focus groups, observations, or materials from printed media such as articles, books, or manuals (Kondracki & Wellman, 2002). Qualitative content analysis goes beyond merely counting words by intensively examining language to classify large amounts of text into a manageable number of categories that represent similar meanings (Weber, 1990). Categories in content analysis can represent either explicit or inferred communication. The aim of content analysis is to provide insight and understanding about the phenomenon under investigation (Downe-Wamboldt, 1992, p. 314).

In this research, comprehensive text-based data will be collected from digital media platforms and coded using a qualitative analysis program. Therefore, conducting both descriptive and content analysis on the collected data aligns with the methodological coherence of the study. Additionally, the MAXQDA Qualitative Data Analysis Program offers significant advantages for both descriptive and content analysis due to its structure and interface features. An additional originality criterion in the method involves visualizing the qualitative and quantitative results of data obtained from interviews, distinguishing this approach from conventional descriptive and content analysis techniques. While visualization is typically more suited for studies involving quantitative and numerical data, the MAXQDA program supports mapping and visualizing both qualitative and quantitative data. Moreover, it allows the quantification of qualitative data through coding methods. Although primarily a qualitative data analysis program, MAXQDA's "Macdicto" feature provides capabilities similar to SPSS, enabling statistical results, concept maps, frequency analyses, and code maps to be generated. MAXQDA supports coding on various formats, including PDF, Word, CSV, PNG, JPEG, video, audio recordings, and other visual materials (MAXQDA Beginner's Guide, 2020). Below is the working interface of MAXQDA Qualitative Data Analysis Program.



(Source: https://www.maxqda.com/homepage-4)

Figure 1. An Example Working Program Interface in MAXQDA Program

One of the most significant features of MAXQDA is its support for Mixed Methods approaches. For every document in the Document System, all attributes (referred to as variables in statistical programs) can be managed. For instance, in interviews, personal data or background information can be recorded as variables or variable values and utilized for Mixed Methods analysis (MAXQDA Beginner's Guide, 2020, p. 25). Prior to this research proposal, the researcher has conducted similar descriptive and content analyses using the MAXQDA program, working on X platform data, YouTube data, and interview transcripts.

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