

International Studies

in the field of

Communication Sciences

October 2026



EDITOR

Prof. Dr. İlknur AYDOĞDU KARAASLAN

gece
kitaplığı

İmtiyaz Sahibi / Yaşar Hız
Yayına Hazırlayan / Gece Kitaplığı

Birinci Basım / Ekim 2026 - Ankara
ISBN / 978-625-321-329-9

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CHAPTER 1

REASSEMBLING MARKETING COMMUNICATION IN THE AI ERA

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Introduction

Over the past three decades, communication has shifted from the relatively stable structure of the mass media toward a configuration in which, as Castells (2010) argues, economic, political and cultural activity is increasingly organized around digital networks. Few fields illustrate this shift as clearly as marketing communication. An advertising paradigm that once addressed mass audiences in a one-way manner through television, radio and the press has given way to persuasion practices that operate on platforms and are data-driven, user-based and interactive. Generative artificial intelligence (AI) signals a qualitatively different phase in this trajectory. Earlier waves of digitalization primarily changed the ways in which messages circulate; generative AI, by contrast, raises the question of where messages come from and who, or what, authors them. Text, images and sound can now be produced at very low cost, and such content is becoming realistic enough to be indistinguishable from human-made content. Today, virtual influencers make this change tangible. Lil Miquela, who emerged on Instagram in 2016 and has since collaborated with major international companies, is a classic example of this situation. Such characters are computer-generated characters that have followers, personality traits, opinions and commercial partnerships, and there is no human behind them as an identifiable subject. What is noteworthy is that these characters, created with artificial intelligence and computer-generated imagery (CGI), exist intensively almost entirely on social media rather than in traditional broadcasting. Platforms bring forward accounts that produce content at regular intervals. Virtual characters naturally meet these criteria, both by being adaptable to every field and by producing content regularly. Generations who have grown up in digital environments and experience platforms as an ordinary part of daily life, that is, digital natives, generally know that these characters are not real, but they nevertheless continue to interact with them. This apparent paradox brings with it an important question that needs to be answered: If a character known to be fictional can persuade its followers, how should authenticity, source credibility and trust, which persuasion studies have long been based on, be addressed anew?

Classical communication models, ranging from Lasswell's (1948) formula to Shannon and Weaver's (1949) transmission-based model, proceed from the assumption that a message is sent by a human who creates it for a specific purpose and is carried through a medium. Generative artificial intelligence makes it difficult to maintain this premise. Algorithms now select, rank and personalize content, while virtual characters deliver it to audiences. While technology in traditional media built bridges between people, artificial intelligence is becoming a party with which the user communicates directly (Gunkel, 2012; Guzman & Lewis, 2020). In other words,

technology no longer functions as a neutral channel but becomes a part of persuasion. Making sense of this requires a framework that treats communication not as the linear exchange of messages but as a network jointly constituted by human and non-human actors.

To this end, the chapter brings together Actor-Network Theory (Latour, 2005), which grants non-human entities the capacity to shape social relations, and the concept of algorithmic gatekeeping, which explains how algorithms govern the content users encounter (Barzilai-Nahon, 2008; Wallace, 2018).

By evaluating the relevant literature within a conceptual framework and drawing on recent examples from global brands, this chapter seeks to answer three questions: Why have virtual characters proliferated on social media platforms rather than in traditional broadcasting? Which gatekeeping functions do these characters assume within the marketing communication network? How does the acceptance of virtual characters vary according to factors such as culture, generation and platform?

Theoretical Framework: Actor-Network Theory and Algorithmic Gatekeeping

Studies examining perceptions of new communication technologies show that individuals regard, for instance, robots as entities distinct from humans, yet still perceive them as communication partners with whom social interaction is possible (Edwards et al., 2016). The emergence of technology as an active party in the communication process calls for this process to be examined through a theoretical framework that does not place the human at its center.

Actor-Network Theory (ANT) is one of the theoretical frameworks that meets this need. In Latour's (2005) approach, the social is understood not as a pre-existing, fixed structure but as a network of relations that is continually reassembled through the connections between human and non-human entities. The theory's most distinctive feature is that it does not regard agency as belonging exclusively to humans. Any object, technology or piece of software that alters relations within a network and makes a difference to the behavior of other actors can be treated as an actor. This perspective sets aside the sharp distinction between humans and technology and directs the researcher to trace which human and non-human actors come together to produce a particular outcome.

By contrast, most research on virtual influencers adopts consumer behavior models such as the Stimulus-Organism-Response (S-O-R) model. In these models, the virtual character occupies the position of a stimulus that influences consumers' cognitive and affective processes and thereby gives rise to behavioral responses (Di Dalmazi et al., 2026). Although such models are

useful for measuring effects, they position the character not as an active party in the communication process but as a passive element directed at the consumer. Following ANT, this chapter instead treats the virtual character as an actor that reconfigures the relations among brands, algorithms and followers.

Indeed, Khalfallah's (2026) bibliometric study shows that the field has grown rapidly since 2021, but that it has concentrated on consumer psychology topics such as authenticity, trust, anthropomorphism and engagement. Studies that examine virtual characters through communication theory, that is, as actors embedded in networks of brands, algorithms and audiences, remain limited. By combining ANT with algorithmic gatekeeping, this chapter aims to contribute to filling this gap.

Callon (1999), one of the founders of ANT, views the market as a demanding test for the theory, because the market sharply separates the goods put into circulation, as passive objects, from producers and consumers, as calculating active subjects. According to Callon, everything is in fact linked through countless connections. What really needs to be explained is how most of these connections are concealed and how only certain actors and roles are brought to the fore. Callon calls this operation framing. Virtual characters are a striking example in this respect: although they are the product of a vast network of design agencies, brands, software and data, they leave this network outside the frame and appear before their followers as a single, coherent personality.

Leggett, Lammi and Mykkänen (2026) have mapped this network and identified ten distinct actors in the influencer economy, including platforms, agencies, influencer hubs and brands. According to the authors, virtual influencers offer brands far greater control than human influencers over how messages and representations are shaped. Through these characters, brand content, a passive object in traditional marketing, is transformed into an actor that speaks, expresses opinions and builds relationships.

The term gatekeeping was first used by Lewin (1947) to describe the points at which information or goods are filtered as they move along particular channels. In communication studies, the concept in its classical form refers to the editors and journalists who decide which news items reach the public and which are discarded (Barzilai-Nahon, 2008).

Digital networks have broadened the scope of the concept. Barzilai-Nahon's (2008) theory of network gatekeeping rejects the view that information control is a one-way, top-down process and conceives of it instead as a dynamic relationship that is continually renegotiated between

gatekeepers and the gated. Wallace (2018) takes this a step further by placing individual users and algorithms alongside journalists among the gatekeepers in his model of contemporary gatekeeping; with this model, the concept of gatekeeping has come explicitly to encompass non-human actors.

Social media platforms reveal this transformation particularly clearly. What comes to the fore in a user's feed and what remains out of view is largely decided by algorithms operating on the basis of engagement data, the strength of relationships between users and commercial priorities (Bucher, 2012). According to Bucher (2012), the visibility constructed by algorithms is not distributed equally; it oscillates between appearing and disappearing and depends on being selected by the algorithm. Users therefore come to perceive visibility as a reward granted by the algorithm and invisibility as a threat (Bucher, 2012). Consequently, content creators must make knowledge of how algorithms work an integral part of their labor in order to remain visible (Cotter, 2019). For marketing communication, this implies that before its content can perform any persuasive function, a message may first need to pass an algorithmic filtering stage that determines who sees it, when and how often. Recent studies, however, show that algorithmic visibility is not always a desirable goal: it can turn into harmful attention, particularly when content reaches unintended audiences, and content creators therefore try to manage their visibility by considering to whom and in which contexts they become visible (Lee, 2025).

In this chapter, the gatekeeping process surrounding virtual characters is conceptualized as two-layered. In the first layer, the algorithm determines to which users, how often and alongside which content the virtual character is shown. In her study of Instagram, Cotter (2019) demonstrated that influencers' visibility is shaped through an ongoing negotiation with algorithms. In the second layer, the virtual character itself acts as a filter; that is, it reshapes the brand's message through its own personality, language and aesthetics before delivering it to followers. This function can be seen as a contemporary counterpart of the intermediary role that Katz and Lazarsfeld (1955) attributed to opinion leaders. Human influencers also perform a similar intermediary role between brands and followers. In the case of the virtual character, however, this filter is governed not by an autonomous human will but directly by the brand and its designers (Zhou et al., 2026). The extent to which the second layer is effective depends on the character's attributes. Davlembayeva et al. (2025) show that attributes such as warmth, competence, trustworthiness and empathy enable virtual influencers to influence their followers through compliance, identification and internalization. Thus, before reaching the consumer, the

brand message passes through two successive gates, controlled first by the algorithm and then by the virtual character.

Two-layered gatekeeping aligns directly with ANT, on which this chapter is based. From the perspective of ANT, neither the algorithm nor the virtual character is a technical tool operating in the background of the marketing communication network. Both are active actors that reconfigure the relations among brands, content creators and consumers. The rapid spread of virtual influencers across platforms also becomes meaningful in this light, since these characters, capable of producing consistent, controllable and uninterrupted content, can readily conform to the algorithm's visibility criteria. Two-layered gatekeeping therefore offers a powerful analytical tool for explaining how non-human actors gain visibility in marketing communication and which persuasive messages consumers encounter.

The Transformation of Virtual Characters: From Brand Mascots to Virtual Influencers

Brands have long conveyed messages through fictional characters. From the Michelin Man of 1898 to the familiar cartoon figures of television commercials, advertising mascots have given brands a recognizable face and voice. These characters, however, have largely lived within the advertisement: they are visible only while the advertisement is on air, deliver a scripted message in one direction and have no existence beyond the advertisement.

Virtual influencers take this tradition to a qualitatively different level. Audrezet et al. (2025) define virtual influencers as digital personas created with AI and CGI, and the appearance of these characters spans a broad spectrum, from those hard to distinguish from a real person to those that are clearly stylized (Zhou et al., 2026). What distinguishes them from mascots, however, is not their appearance but their position in the communication process. Whereas the mascot is visible only for the duration of the advertisement, the virtual influencer maintains a continuous presence on social media. It shares glimpses of its everyday life, expresses opinions, responds to comments and develops a relationship with its followers that deepens over time. In other words, while the mascot is a representational device that the brand employs at the moment of advertising, the virtual influencer has become the brand's continuous and interactive face on social media.

The distinction ANT draws between intermediaries and mediators offers a useful framework for understanding this transformation. According to Latour (2005), an intermediary transports meaning unchanged from one point to another, whereas a mediator transforms, translates and reshapes what passes through it. The classical mascot is largely positioned as an intermediary,

since it conveys the brand's predetermined message without any alteration. The virtual influencer, by contrast, functions as a mediator, since it reinterprets the brand's message through its own personality, its language and the relationships it builds with its followers. Lu do Magalu is a striking example of how this transformation can unfold within the trajectory of a single character. Designed as the virtual assistant of the Brazilian retail chain Magazine Luiza, the character has over time become one of the most followed virtual influencers in the world.

Generative AI, in turn, opens the door to a new stage in this transformation. Audrezet et al. (2025) count the emergence of autonomous virtual influencers, which are becoming increasingly independent in content production, among the field's priority research directions. Whereas the posts of first-generation virtual characters were prepared by design teams, generative AI enables these characters to produce their own content at the level of text, images and even interaction. The virtual character thus becomes an actor whose scope of agency keeps expanding, even as it remains under the brand's control.

Another consequence of this technology is that the production of virtual characters is moving beyond the monopoly of brands and agencies and becoming accessible to ordinary users. Meta's AI Studio tool allows Instagram users to design and share their own AI characters. Independent AI content studios such as Omnigems take this service a step further, enabling users to create their own virtual influencers and earn income from them. Platforms and AI tools are thus turning from environments in which virtual characters merely circulate into the infrastructures through which these characters are produced. From an ANT perspective, this indicates that the network bringing the virtual character into being is expanding. As users also move into the position of producers, brands' control over this network is being renegotiated.

Why Not Traditional Media?

The concentration of virtual characters almost exclusively on social media is no coincidence. It can be explained by four interrelated factors.

The first factor is interaction and continuity. The value of a virtual influencer derives from the relationship it builds with its followers over time, and such a relationship can be sustained only in environments where communication is reciprocal and uninterrupted. The one-way, schedule-bound structure of television, radio and the press would reduce the virtual character once again to the position of a mascot, that is, a figure that exists only while the advertisement is on air. It is telling in this respect that most research on virtual influencers focuses on Instagram, where interaction is intense and visual content dominates (Zhou et al., 2026).

The second factor is the visibility logic of platforms. As noted in the theoretical framework, visibility on social media is distributed by algorithms as a scarce resource (Bucher, 2012), and influencers must engage in a constant negotiation with the algorithm in order to remain visible (Cotter, 2019). Virtual characters, which can post consistently, regularly and without interruption, can be said to have a structural advantage over human content creators in adapting to the algorithm. This fit between platform logic and the nature of virtual characters makes them the natural actors of social media.

The third factor is control and risk. Brands prefer virtual influencers because they find them scalable, flexible and low risk (Audrezet et al., 2025). Virtual characters allow brands to shape the appearance and content of these figures as they wish, while also reducing the risk of reputational damage that may arise from the personal scandals of human influencers (Zhou et al., 2026). This has a notable consequence for gatekeeping. In traditional media, a brand's message must pass through institutional gates such as broadcasters, editors and the process of purchasing advertising space. On social media, by contrast, a brand can manage its own channel directly through a virtual character and bypass these institutional gates. Gatekeeping does not disappear in this process, however; it is merely transferred to the algorithm.

The fourth factor is the target audience. The groups most receptive to virtual characters are the young generations who have grown up in digital environments (Khalfallah & Keller, 2025), and these generations consume media largely through platforms. The literature shows that virtual influencers are more effective in technology-oriented and visually driven sectors such as gaming and digital beauty, whereas human influencers stand out in areas that require emotional connection and trust (Coşkun, 2026). The target audiences of these sectors are also predominantly found on platforms.

Nevertheless, the confinement of virtual characters to platforms may not be permanent. Audrezet et al. (2025) count the expansion of these characters into other media among the key future research directions of the field. This suggests that virtual characters may be born on platforms and gradually move into other media, thereby reversing the familiar flow from traditional to digital media.

Factors Explaining the Acceptance of Virtual Influencers

Research examining the impact of virtual influencers on consumers shows that this impact operates largely through the character's human-likeness (Di Dalmazi et al., 2026). Davlembayeva et al. (2025) note that virtual influencers can be divided into human-like and

non-human-like characters according to their physical appearance. This distinction, based on the extent to which characters resemble humans, can be addressed through the concept of anthropomorphism. David et al. (2022) argue that anthropomorphism manifests itself in five distinct dimensions. The physical dimension refers to a character's resemblance to humans in terms of appearance, voice or tactile features. The behavioral dimension covers its movements, verbal and non-verbal expressions and its capacity for social interaction. The cognitive dimension concerns the extent to which the character creates the impression that it can think like a human. The emotional dimension corresponds to the perception that the character can express emotions. Finally, the moral dimension reflects the expectation that the character will behave in accordance with moral norms and can be held responsible for its actions.

Studies show that high human-likeness is a key determinant of purchase intention and that this effect operates through source credibility, customer engagement and attitude (Nguyen & Wu, 2026). Zourrig et al. (2025) found that the sense of social presence evoked by a virtual character indirectly increases purchase intention by making consumers more willing to comply with the character's recommendations. In this context, perceived social presence can also be considered one of the important factors at play in this process.

Perceived social presence strengthens trust and engagement, which in turn increases consumers' purchase intention and their willingness to recommend the brand to others (Jiang et al., 2019, as cited in Park et al., 2025). These findings also help to explain the paradox outlined in the introduction. People respond socially to technology not because they mistake it for a human, but because their communicative habits have been formed through interpersonal interaction (Nass & Moon, 2000, as cited in Guzman & Lewis, 2020). As a result, knowing that virtual characters are artificial does not prevent followers from establishing social bonds with them.

The findings indicate that the persuasive power of virtual characters originates not only from the character itself but also from the relationships it establishes with users. In their study, Cascio Rizzo et al. (2026) determined that posts in which virtual influencers appeared together with people received approximately 21% more engagement. According to the authors, the presence of humans makes the artificial character more realistic and more reliable. From the ANT perspective, this finding shows that the effect of the virtual character originates from its own characteristics together with the bonds it establishes with human actors in the network. However, these effects do not appear in the same way in every context; as a matter of fact, Khalfallah and Keller's (2025) systematic review on virtual influencer marketing reveals that consumer reactions differ according to culture, generation and platform.

While virtual characters are adopted more easily in Asian markets such as South Korea and Japan, Western consumers generally feel suspicious toward overly constructed digital personalities (Khalfallah & Keller, 2025). One of the frequently used frameworks for explaining why consumer behaviors differ between countries is Hofstede's (2011) national culture model. The model puts forward that societies are located in different positions on various cultural dimensions and that these differences shape the attitudes and behaviors of individuals. Individualism-collectivism, one of these dimensions, explains to what extent individuals see themselves as independent subjects or as part of a broader community, and how this perception is reflected in their social relationships (Huff & Kelley, 2005). In this respect, in collectivist cultures, the bond established with virtual characters may originate less from whether the character is real or not than from its being an experience shared within the community.

In addition to cultural differences, the acceptance of virtual characters also differs markedly across generations. Digital natives approach non-human communicators with different expectations than generations who became acquainted with digital environments later. While Generation Z shows a high level of engagement in its interactions with artificial intelligence (Zheng et al., 2024), older consumers or digital immigrants see the absence of a real human experience as an obstacle to trust (Willemsen et al., 2025).

In addition to this, reactions also vary according to the platform. While virtual characters are accepted more easily on the Instagram platform, where flawless-looking content is dominant, on TikTok, where authenticity is valued more, overly artificial-looking content may cause users to lose interest (Khalfallah & Keller, 2025).

Another factor explaining acceptance is the process of exposure. According to Zajonc's (1968) mere exposure effect, repeated encounters with an object or person can spontaneously change attitudes toward it in a positive direction. Algorithmic gatekeeping strengthens this effect. Virtual characters that meet the visibility criteria of the algorithm appear more frequently in users' feeds, and these repeated encounters can increase familiarity and therefore acceptance, even if users know that the character is artificial.

Nevertheless, the moderating role of factors such as culture and age has not yet been clarified; as a matter of fact, a meta-analysis determined that these effects were not significant (Nguyen & Wu, 2026). Still, existing studies show that the effect of virtual characters may depend not only on the character itself but also on the cultural, generational and platform-specific contexts in which the character is located.

Discussion and Conclusion

Returning to the question posed in the introduction, the findings suggest that authenticity has not disappeared but that its meaning has been transformed. Followers know that the character is artificial and can nonetheless form a relationship of trust with it. This indicates that authenticity has come to depend less on whether the source is human than on the consistency of the character, the continuity of interaction and the cultural context in which the character is situated. The finding that virtual characters are perceived as more trustworthy when they appear alongside humans (Cascio Rizzo et al., 2026) further suggests that authenticity is nourished not only by the character itself but also by the relationships it forms within the network. Taking human communication as the sole benchmark for evaluating human-machine communication may render such transformations invisible (Spence, 2019, as cited in Guzman & Lewis, 2020). It can therefore be argued that the concept of authenticity needs to be redefined in the context of virtual characters.

Similarly, the linear logic of classical models falls short in explaining persuasion processes involving virtual characters. In the models of Lasswell (1948) and of Shannon and Weaver (1949), a message travels from a human sender to a receiver through a medium. In the approach proposed in this chapter, by contrast, the brand message passes through the filters of the algorithm and of the virtual character before reaching the follower. Moreover, at both gates the filtering function is performed by a non-human actor: the algorithm at the first, and at the second the virtual character that appears before the follower, even though the brand and its designers stand behind it. Marketing communication should therefore be understood not as a linear chain of transmission but as a network jointly constructed and continually reshaped by human and non-human actors.

The proliferation of virtual characters also raises a number of social and ethical questions, foremost among which is transparency.

For a persuasive relationship to be ethically legitimate, followers need to know that the character they interact with is artificial and which commercial interests it represents (Khalfallah & Keller, 2025). The European Union's Artificial Intelligence Act includes transparency obligations regarding the disclosure of this characteristic of content generated by artificial intelligence (European Union, 2024).

Other issues that need to be discussed include the risk of human content creators being replaced by virtual characters and the reproduction of certain beauty and identity standards (Thompson et al., 2025).

The increasing use of virtual influencers is also changing the nature of labor in content production. In this process, while programmers and designers take on more prominent roles, brands may have more say in how the characters are presented and which messages they convey (Leggett et al., 2026). The concentration of control on brands to this extent makes transparency even more important.

Research on virtual characters can focus on how these characters are positioned in different communication environments. The use of virtual characters that emerged on social media platforms in different media such as advertising, music, television and games raises the question of how they are perceived depending on the environment in which they are located. As the autonomy of characters increases thanks to generative artificial intelligence technologies, how their agency within the network changes can also be investigated. In addition, extending cross-cultural studies beyond Asian and Western societies to include societies such as Türkiye, where different cultural interactions coexist, can contribute to understanding the relationship between perceptions of virtual characters and cultural context.

In conclusion, the network-oriented approach of ANT makes it possible to understand both the effects of virtual characters on consumer responses and their roles in the reshaping of marketing communication through the relationships they establish with human and non-human actors.

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CHAPTER 2

THE TRANSFORMATION OF CONSUMPTION IN NEW MEDIA ENVIRONMENTS

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1. Introduction

Digitalization is changing the ways in which consumers encounter products, compare options and share their shopping experiences. DataReportal's reports (Kemp, 2025a, 2025b), which include data from October 2025, put internet users at 73.2% of the total population worldwide and 88.3% in Türkiye. Social media user identities correspond to 68.7% of the total population worldwide and 70.9% in Türkiye. The difference between Türkiye and the world is 15.1% for internet use and 2.2% for the social media indicator. Since social media user identities do not represent unique individuals, this indicator should be evaluated separately from the internet user rate. The Turkish Statistical Institute's Survey on Information and Communication Technology Usage in Households also reports that the share of individuals in the "16–74" age group who purchased or ordered goods or services online was 55.7% in 2025 and 60.0% in 2026 (Turkish Statistical Institute, 2026). Although these indicators are based on different population groups and measurements, they reveal how pervasive digital environments are in consumers' everyday lives.

The influence of digital media on consumption begins before the purchase, at the stage where products are discovered. The GWI survey reported in DataReportal's 2026 mid-year report (Kemp, 2026) revealed that 90.3% of participants learned about new products and services through digital media. More than 57% of adult internet users stated that they preferred online shopping to shopping in physical stores. The widespread use of digital technologies in product discovery points to an environment in which consumers can use digital and physical channels together throughout the shopping process. Consumers can research product features online, examine the product in a store and complete the purchase through the channel they choose according to price or delivery conditions. In this respect, digital consumption is a process that brings different channels together, extending from product discovery to post-purchase communication.

In the process of obtaining information about products, user reviews, ratings and community discussions appear alongside brands' own descriptions. Hajli et al. (2017) examine the relationship between trust and purchase intention in a social commerce environment. The study explains the place of communication among consumers within the social environment in which shopping decisions are formed. Experiences shared after purchase regarding the use of a product become information sources that other consumers draw on before purchasing (Mudambi&Schuff, 2010). Thus, in addition to benefiting from information about the product,

consumers also take part in the production and circulation of information by sharing their own experiences.

Users' participation in content production is related to Jenkins's (2006) participatory culture approach and to Ritzer and Jurgenson's (2010) discussion of "prosumption," which explains the intertwining of production and consumption. Consumption preferences also contribute to the expression of belonging and lifestyle through sharing (Featherstone, 2007). However, the environments in which users express themselves operate together with the commercial activities of platforms. While the time and effort spent preparing content constitute the user labor on which the digital economy draws, shopping interfaces also shape how options are presented (Terranova, 2000; Mathur et al., 2019). Explaining digital consumption therefore requires considering users' sharing purposes together with the commercial benefit that platforms derive from data, content and interaction. Artificial intelligence is adding new tools to the preparation of the commercial content that consumers encounter. Çeber and Çeliker (2024) examined consumers' perceptions and behavioral intentions by showing 310 people an advertising visual prepared using generative artificial intelligence. The study does not measure actual purchasing behavior; it focuses on how consumers respond to such content. Consequently, in digital consumption, how content is produced has become a subject of research as much as what it says. User contributions, algorithmic recommendations and messages prepared with artificial intelligence coexist in the environment in which consumers obtain information about products.

This study examines the transformation of consumption in new media environments through user participation, the commercial operation of platforms and artificial intelligence applications. The focus of this literature-based conceptual review is on consumers' processes of encountering products, forming preferences, purchasing and sharing their experiences. After addressing the relationship between new media, influencers and consumption, the chapter explains participatory culture and the participation economy, social capital, visibility and the like economy in digital consumption. The discussion of algorithmic steering is followed by gamification and game-like consumption. In addition to examining digital identity, social image and conspicuous consumption, as well as the effects of artificial intelligence on consumption and content production practices, the chapter addresses digital consumer consciousness and ethics, problematic digital use and digital balance, and digital consumption awareness.

2. New Media, Influencers and Consumption

New media refers to environments such as websites, social media platforms and mobile applications that operate through digital technologies and network connections and enable users to access content and participate in communication (Lister et al., 2009). The same authors explain new media through characteristics such as being digital, interactive and networked. In digital consumption, these characteristics correspond to activities such as consumers accessing product promotions, asking sellers questions and comparing different sales channels. Van Dijk (2020) approaches digital networks not as a domain independent of face-to-face communication but as communication structures that operate together with social relations. In new media environments, products reach consumers not only through advertisements prepared by businesses but also within the posts of content creators.

Influencers are social media content creators who produce content around particular topics and direct their followers' attention to products, brands or services (Pan et al., 2025). Showing a product in everyday use combines promotion with personal narrative. For example, using a kitchen appliance in a cooking video presents the product's features within the process of use rather than in a separate advertising text. The value of such a post for consumers is related to how clearly it explains what the product does and to how trustworthy the person making the recommendation is considered to be.

In their meta-analysis, which draws on a sample of 251 publications and combines 1,531 effect sizes, Pan et al. (2025) examine post, follower and influencer characteristics together with different marketing outcomes. The study finds that post characteristics, namely the informational and hedonic value of posts, have comparatively strong effects on purchase intention. Drawing on the persuasion knowledge model, the authors also show that these characteristics shape outcomes indirectly via source credibility. Furthermore, the influence of influencers in consumption communication is explained not only by follower count but also by the quality of the content they provide and by how consumers interpret the recommendation; the study distinguishes non-transactional outcomes (attitude, behavioral engagement and purchase intention) from transactional outcomes (purchase behavior and sales). The consumer's interpretation of the purpose behind a recommendation can be explained by Friestad and Wright's (1994) "Persuasion Knowledge Model." This model states that people develop knowledge over time about advertisers' goals and the tactics they use, and that they draw on this knowledge to regulate their responses to the messages they encounter. When consumers question whether an influencer recommends a product because of personal experience or as part

of a paid collaboration, they are evaluating the commercial purpose of the message. Consumers thus evaluate product information together with the recommender's commercial relationship. The influence of influencer posts emerges in consumers' attitudes toward the product, their engagement with the content and their purchase intention.

3. Participatory Culture and the Participation Economy in Digital Consumption

In digital environments, user participation is explained through participatory culture and the conversion of participation into economic value. "Participatory culture" refers to a cultural environment in which users take part in producing, interpreting and sharing content, pass on their experiences and form bonds around shared interests (Jenkins, 2006). The "participation economy," on the other hand, is a framework that explains how the content, information and interactions provided by users are turned into commercial benefit for platforms and brands (Terranova, 2000; Van Dijck&Nieborg, 2009). While participatory culture focuses on how users learn, share and build communities, the participation economy questions who benefits economically from their contributions and how.

Jenkins et al. (2009) define participatory culture through five characteristics: relatively low barriers to artistic expression and civic engagement, strong support for creating and sharing one's creations, informal mentorship through which the most experienced members pass knowledge on to novices, members' belief that their contributions matter, and some degree of social connection among members. Moreover, not every member is expected to produce content continuously; the openness of the opportunity to contribute and the belief that contributions will be valued are the core elements of participatory culture. In product review communities, writing reviews, sharing experiences and learning from other members are the counterparts of these characteristics in digital consumption. The ease of writing reviews corresponds to low barriers to participation, and photo and video sharing tools correspond to support for content production. Experienced members answering questions about product use embodies knowledge transfer; contributions being found useful embodies members' sense of being valued; and sustained communication embodies social bonds.

The fact that sharing and learning relationships take place on commercial platforms also raises the question of the economic benefit derived from user contributions. Van Dijck and Nieborg (2009) critically examine the discourses of collaboration and co-creation in Web 2.0 business manifestos. In this context, they argue that presenting participation as co-production pushes into the background the commercial interests operating within the same process. A product review prepared to help others provides the business with information about customer

expectations and with content that supports the product's promotion. Framing participation as mutual help obscures the value that the time and knowledge spent on preparing content have for the business's operations.

A user who assumes the roles of producer and consumer at the same time is called a "prosumer." In their approach to "prosumption," Ritzer and Jurgenson (2010) treat production and consumption as intertwined processes and discuss the place of user-generated content on the internet in the workings of capitalism. A consumer who records a video of setting up a newly purchased device also produces information that others will benefit from while using the product. The platform's incorporation of the video into its service without payment shows how commercial benefit is derived from the user's time and knowledge.

Bruns's (2008) concept of "produsage," in turn, focuses on the continuous development of content through user contributions. In this context, a product comparison guide prepared jointly by users is an example of a similar form of production in digital consumption. The guide is updated as one member adds technical specifications, another notes problems in use and yet another corrects outdated information. Consumers thus benefit from an information source while also contributing to its development through their own experiences.

4. Social Capital, Visibility and the Like Economy in Digital Consumption

Digital platforms mediate consumers' connections with brands, sellers and different social circles. Castells's (2010) "network society" approach explains how social relations and economic activities are organized through networks supported by information and communication technologies. Reaching a local producer via social media or communicating with a second-hand seller in another city shows how shopping opportunities in digital consumption extend beyond physical proximity. The opportunities that networks offer consumers are not limited to establishing connections; they also include the information and support accessed through relationships. Social capital refers to the information, support and other resources a person accesses through their relationships. Obtaining new information and opportunities through connections established across different social circles is explained as bridging social capital (Ellison et al., 2007). The same study revealed a relationship between Facebook use and, in particular, bridging social capital.

While seeking information and support within digital relationships, users also make an effort to have their own posts noticed. In the digital world, visibility labour refers to the activities carried out to attract attention and stay on the agenda through preparing and sharing

content. A study conducted in 2016 on Instagram influencers and their followers in Singapore examined followers' participation in fashion-focused advertising campaigns. The study shows that preparing an outfit photo with a campaign hashtag combines the user's effort to be noticed with the brand's promotion in the same content (Abidin, 2016). Consequently, the object of consumption becomes part of the post that the user prepares to gain visibility. The reactions a post receives provide feedback to the user through like and share counters. The recording of these same reactions by the platform links visibility labour to data production. Gerlitz and Helmond's (2013) like economy approach explains how social buttons turn interactions into numerical indicators and feed them into data flows across the web. Liking a store's campaign post signals interest from the consumer's perspective while constituting a recordable behavior from the platform's perspective. Economic value arises less from each like turning directly into a sale than from the use of interaction data for tracking, measurement and commercial activities. In this context, the fact that recorded interactions provide information about consumer interests links the discussion of social relations and visibility to personalized content, product and advertising recommendations.

5. Digital Consumption and Algorithmic Steering

In digital consumption, the processes of searching for, comparing and choosing products are related to how platforms process user data. Zuboff (2015) addresses the use of behavioral data derived from user experiences in the production of economic value through the approach of "surveillance capitalism." This approach explains how everyday activities become a resource for businesses to analyze and predict behavior. The searches and clicks that consumers make for shopping purposes also provide data for preparing personalized product recommendations and commercial messages. Beyond ranking products, recommender systems also affect the judgments consumers form about products. In their experimental research, Adomavicius et al. (2013) found that the predicted ratings displayed by the system influenced the ratings participants subsequently gave. In this process, known as the "anchoring effect," users take the numerical value presented by the system as a reference when forming their own judgments. In the study, product evaluation is the rating a person gives regarding how much they like the product. The findings show that recommender systems not only reflect existing preferences but also take part in the formation of preferences. Rather than directly addressing purchasing behavior, the study explains how consumers' judgments about products are shaped.

The relationship between personalized content selection and information diversity comes to the fore in Pariser's (2011) concept of the "filter bubble." The filter bubble refers to

users predominantly encountering content consistent with their own interests, beliefs and inclinations as a result of algorithmic personalization. In terms of digital consumption, the concept relates to the question of which products are brought to the fore by recommendations matching past preferences and to what extent alternatives remain visible. For example, the repeated presentation of similar products after searches in a particular product category illustrates how options are arranged in line with previous interests. The effect of personalization on product diversity, however, should be explained by examining the brands, categories and price ranges presented. Encountering similar recommendations should be distinguished from being in an information environment isolated from alternatives. The product information consumers encounter is shaped not only by algorithmic selection but also by the posts of the people and communities they follow.

An echo chamber refers to an environment in which like-minded people communicate predominantly with one another, the same ideas are reinforced through repetition and opposing views circulate to a more limited extent (Cinelli et al., 2021). For example, a community in which a brand's positive features are constantly emphasized while critical comments are excluded illustrates how the concept works. In such an environment, users frequently encounter the brand's advantages while having more limited access to negative user experiences. In the filter bubble, algorithmic content selection comes to the fore, whereas in the echo chamber, the circle with which users communicate and selective information sharing are prominent. Purchase tendency, however, is related not only to the messages encountered but also to price, need and previous user experiences. The platform's influence continues after products have been displayed. The incentives offered to keep users researching, returning to the app or completing a purchase draw attention to how the shopping experience is organized beyond recommender systems.

6. Gamification and Game-Like Consumption

Gamification refers to applying elements of game design in contexts that are not games (Deterding et al., 2011). In digital consumption environments, points, badges, levels, tasks and progress indicators can organize the shopping experience around achieving goals and receiving feedback. Beyond making purchases, users become participants who complete tasks, accumulate points and gain access to new privileges. In this respect, gamification adds an experiential dimension to the relationship between brand and consumer that extends before and after the purchase. How this structure works can be explained through membership and reward programs that bring game elements together. Users earning points by completing certain

activities, accumulating points on a progress indicator and unlocking different privileges at the next membership level create a sequence of goals. Daily login tasks, badges awarded for activities outside shopping and campaigns based on collective goals can also be given as examples of this design. Nevertheless, not every loyalty card or coupon application is gamification. What is decisive is how game elements structure activities and participation. The motivational dimension of gamification can be explained through “Self-Determination Theory,” which is based on the needs for autonomy, competence and relatedness. Supporting these needs contributes to the development of intrinsic motivation (Ryan&Deci, 2000). In a gamified environment, being able to choose among tasks can be associated with autonomy; visible progress and feedback on achievement with competence; and collective goals and community activities with the need for relatedness. A design in which rewards put pressure on users should not be expected to produce the same motivational outcomes as a design that supports voluntary participation and choice.

In online gamified brand communities, Xi and Hamari (2020) found that gamification features related to achievement and social interaction were positively linked to all three dimensions of brand engagement, namely emotional, cognitive and social engagement. Santos et al. (2024) evaluated 114 articles examining gamification in marketing using bibliometric analysis and a theories, contexts, characteristics and methodologies framework. According to the review, studies mostly treat gamification as an element of system design and examine how it affects consumers’ experiences, engagement and behavior, with self-determination theory being the most frequently used theory. When evaluating these findings, showing interest in an application, forming an emotional bond with a brand and purchasing behavior should be distinguished from one another. Increased engagement does not in every case mean increased sales or long-term loyalty. Numerical feedback can also be observed on social media. Like, comment and view counts make the response to a post visible (Gerlitz&Helmond, 2013). However, the presence of these indicators is not sufficient to classify all social media use as gamification. Mechanisms that encourage participation may also involve tensions with respect to user autonomy. Mathur et al. (2019) identified deceptive countdown timers, scarcity notifications and various dark patterns steering users toward particular choices on online shopping websites. Gamification and these practices are not the same concept. Nevertheless, transparency, voluntary participation and users’ ability to end the process are important in evaluating a system involving tasks and rewards. The quality of gamification in digital

consumption should be addressed in terms of how users' time, budget and decision-making autonomy are treated alongside the goal of increasing engagement. Badges and rankings in gamification applications make it possible to display achievements when they are visible to other users. These indicators are related to the way people present themselves. Sharing product and brand preferences can also contribute to social image. Consumption becoming visible as a marker of status and belonging lays the groundwork for examining the relationship between digital identity and conspicuous consumption.

7. Digital Identity, Social Image and Conspicuous Consumption

Identity presentation in digital environments is users' arrangement of the impression they wish to create about themselves through photographs, narratives and consumption preferences. Goffman's (1959) approach to the presentation of self explains how individuals shape their behavior and the information they present about themselves in everyday interactions according to their audiences. Kavut (2018), in a study on Instagram, examines self-presentation and identity construction within this theoretical framework. Sharing clothing, food, travel and venue preferences online creates a narrative about a person's tastes and lifestyle. While users present selected moments of their lives, their social image, that is, the impression others form of them, is shaped by how audiences interpret their posts.

The fact that consumption preferences represent the person is related to the cultural meanings that objects carry. Baudrillard's (1998) analysis of consumer society emphasizes that objects acquire meaning not only through their use value but also through their sign value, which expresses social distinctions. While a product's function concerns which need it meets, its sign value concerns the taste, belonging and social position associated with it. A coffee photograph presents not only the drink but also the chosen venue and a particular everyday lifestyle. The brand, the venue and the composition of the photograph together determine what the object of consumption conveys to the audience. Veblen's (2017) "conspicuous consumption approach" explains how spending on goods and services is used to display material means and social prestige. Here, the object of consumption is presented not only for the functional benefit it provides but also as a sign that makes the person's economic position visible. In digital environments, sharing luxury products, exclusive services and expensive trips through photos, videos and location information expands the audience for such display. While identity presentation encompasses the narrative people construct about themselves, conspicuous consumption focuses on foregrounding spending power and status within this narrative. The distinction between a product post that aims to inform, express aesthetics or share an experience

and one that emphasizes economic superiority is explained through the post's narrative and mode of presentation.

The response that a shared consumption preference receives from audiences is related to the concept of social approval. Köksalan (2021) describes social approval as the acceptance of an individual's values and behaviors by a social circle. The author also conceptually examines the role of social approval in the spread of consumer culture. In digital consumption, a chosen product or lifestyle being met with likes and comments provides feedback on the representation that the user presents. While the number of likes shows the reaction a post receives, the meaning of acceptance is formed together with who reacts and the content of the comments. A supportive comment from a close friend and brief reactions from a large audience carry different social meanings for the user. What a person buys, which preference they share and how the post is received are interconnected processes. Product choice is related to economic conditions and needs, the mode of presentation to the impression the user wishes to create, and the audience's reaction to the values and expectations of the social circle.

8. The Impact of Artificial Intelligence on Consumption and Content Production Practices

Artificial intelligence generates predictions by analyzing data and produces new content such as text and images through generative models. Hermann and Puntoni (2024) address this distinction between predictive and generative artificial intelligence from the perspective of consumer behavior and marketing. In digital consumption, the distinction can be seen between identifying a product a consumer might be interested in and writing an advertising message for that product that suits the consumer's needs. While businesses use artificial intelligence to create promotional content for different target audiences and to support consumer research, consumers use it to compare product features and obtain information about options.

AI-assisted content production has been examined in experiments on writing tasks and advertising visuals. Noy and Zhang (2023) found that exposure to ChatGPT in midlevel professional writing tasks decreased the average time taken by 40% and raised output quality by 18%. Hartmann et al. (2025) compared AI-generated and human-made content in the field of advertising visuals, evaluated AI-generated images in terms of quality, realism and aesthetics, and then measured click-through rates in a real digital advertising campaign. In the field experiment, the best-performing AI-generated image reached a click-through rate up to 50% higher than that of a professional stock photo produced by humans. The measured click-through rate indicates the advertisement's success in directing consumers to the content.

Examining the personalization of messages, Matz et al. (2024) found that ChatGPT-generated messages tailored to recipients' psychological profiles were considerably more influential than messages without personalization. The study measures the persuasiveness of messages and does not track purchases.

Information about the source of content production also shapes consumer responses. In three experiments, Brüns and Meißner (2024) examined how information about the use of artificial intelligence in content production affects follower evaluations. The authors report that brands' use of generative AI triggers negative attitudes and behavioral responses among followers, an effect that operates through perceived brand authenticity; these reactions become weaker when generative AI supports human creators instead of replacing them through automation. Kirk and Givi (2025) also found that consumers who believe an emotional marketing message was written by AI rather than by a person show lower positive word of mouth and weaker customer loyalty. This "AI-authorship effect" is weaker for factual messages and in cases where artificial intelligence merely edits a text rather than writing it.

The gain in speed in content production emerges together with problems of verification and transparency. In semi-structured interviews with 16 content creators active on YouTube, Instagram and TikTok, Kim et al. (2026) examined creators' motivations, practices and challenges regarding the responsible use of generative artificial intelligence. According to the findings, creators practice responsible AI use in order to manage their personal reputation, build trust with their audiences and fulfill a broader social responsibility. However, the pressures for visibility, engagement and monetization created by platform algorithms come into conflict with responsible AI practices, and the extensive, largely unseen responsibility work that creators carry out clashes with the fast pace of algorithm-driven content production. The authors therefore propose design measures at individual, community and institutional levels so that responsibility does not rest on creators alone. In digital consumption, the counterpart of responsible content production is preventing the misrepresentation of product features and disclosing the source of the information that consumers rely on in their decisions. The fact that disclosures about the use of artificial intelligence affect perceived brand authenticity also reveals the link between transparency and audience trust (Brüns&Meißner, 2024). Content accuracy and transparency about the source of production are concrete practices of responsibility toward consumers.

9. Digital Consumer Consciousness and Ethics

Ethics in digital consumption concerns how products are promoted, for what purposes user data are processed and what kind of decision-making environment is offered to consumers. Lobschat et al. (2021) define corporate digital responsibility as the shared values and norms that guide an organization's conduct in four core processes involving digital technology and data. Wirtz et al. (2023) applied the concept of corporate digital responsibility to service firms and note that service robots, artificial intelligence and digitization pose serious risks with respect to ethics, privacy and fairness. According to the researchers, corporate digital responsibility is especially crucial in services, since these involve large flows of customer data and digital service technologies that are omnipresent, opaque and complex. The authors also evaluate responsibility within the digital service ecosystem formed by firms, customers and technology providers. Among these risks, privacy concerns with whom and for what purposes the information provided during shopping is shared. Fairness, in turn, questions whether data-driven decisions place certain consumer groups at a disadvantage. Responsibility thus covers not only consumers' caution but also firms' practices of collecting and processing data and delivering services. The use of artificial intelligence in commercial communication extends responsibility to the preparation of content and to automated decision-making processes. Hermann and Puntoni (2025) propose the ASSURANCE principles for the ethical design and deployment of generative artificial intelligence in marketing, including autonomy, security, accountability, and nonbiasedness and nondiscrimination. Autonomy is a person's say over which decisions they make themselves and which they leave to artificial intelligence. Accountability refers to determining responsibility for the outcomes of the systems used. Explaining the rationale for an automated product recommendation, correcting misinformation and offering users the opportunity to examine alternatives illustrate how these principles are put into practice.

Transparency in commercial communication means that consumers can understand the relationship within which a product recommendation has been prepared. The presentation of advertisements alongside personal experience narratives on social media obscures the commercial purpose of a recommendation. The Guide on Commercial Advertising and Unfair Commercial Practices by Social Media Influencers, adopted by the Advertising Board on 4 May 2021, sets out the principles for presenting advertisements in a clear, understandable and distinguishable manner. In posts made in return for monetary gain, free products or discounted services, disclosure of the commercial relationship is mandatory. Advertisers, advertising

agencies, media outlets and social media influencers are responsible for compliance with the guide (Advertising Board, 2021). Transparency is reflected not only in advertising disclosures but also in shopping interfaces. OECD (2022) describes dark commercial patterns as practices, typically embedded in online interfaces, that push, mislead, pressure or manipulate consumers toward choices that frequently work against their own interests. Showing additional fees at the end of a transaction and making it difficult to cancel a subscription are examples of steering consumers' decisions through the interface. Ethical responsibility in digital consumption encompasses consistency between the information a business provides and the actual terms of the transaction, as well as users' freedom to change their choices.

10. Problematic Digital Use and Digital Balance

The place of digital consumption in everyday life is evaluated not only through the time spent online but also through the purpose of use and its consequences for one's life. Self-regulation refers to a person monitoring and managing their behavior in line with the goals they set (Reinecke et al., 2022). In explaining the relationship between social media use and well-being, the authors focus on the alignment of use with personal goals and on self-regulation processes. Ellison et al. (2022), in turn, adopt a sociotechnical approach that considers users' motivations, social relationships and platform features together. The same amount of usage time corresponds to different experiences for a person maintaining social relationships and for a person who constantly postpones everyday responsibilities.

Problematic behavior in online shopping is related less to purchase frequency than to loss of control, intense buying urges and continued shopping despite negative consequences. In the criteria they proposed through expert consensus for compulsive buying-shopping disorder, Müller et al. (2021) also address the use of shopping to regulate emotions and its leading to significant problems in economic, social or everyday life. Ni et al. (2026) evaluated the proposed criteria in interviews with 51 people with lived experience of compulsive buying-shopping disorder. The difference between regularly buying needed products and continuing to shop despite growing debt and neglected daily responsibilities is explained through control over the behavior and its consequences.

Consumers' efforts to manage their shopping take place within the decision-making environment offered by platforms. Examining approximately 11,000 shopping websites, Mathur et al. (2019) identified dark design patterns that steer users toward purchasing or sharing more information. Rather than examining shopping disorder, the study explains how the environment in which consumers evaluate their options is arranged for commercial purposes.

Consequently, the discussion of problematic digital consumption encompasses not only how individuals manage their buying urges but also how platforms affect the processes of comparison, deliberation and reconsidering decisions.

Digital balance refers to consumers managing the time they spend and the purchases they make on digital platforms in line with their needs, economic means and everyday responsibilities. Product research constantly causing other tasks to be postponed, exceeding a planned budget while following campaigns, or shopping notifications frequently directing attention toward buying illustrate the relationship between digital use and consumption decisions. Parry et al. (2023) examine the adoption and use of digital wellbeing applications and their perceived effects. Usage-time logs and app limits offer tools that help people monitor their online habits. In terms of digital consumption, recording the time and budget allocated to shopping, reviewing the reasons for purchases and managing notifications are practices that link digital balance to shopping decisions. While digital balance focuses on consumers managing their time and budget, understanding the commercial purpose of advertisements, the grounds for product claims and the steering by platforms supports digital consumer consciousness.

11. Digital Consumer Consciousness and Awareness

Digital consumer consciousness encompasses not only obtaining information about products and services but also evaluating the source, purpose and reliability of that information. The European Commission's DigComp 3.0 framework addresses digital competence together with critical evaluation, safety, personal data protection and the responsible use of digital technologies. The framework also integrates knowledge and skills related to artificial intelligence into various competence areas (Cosgrove&Cachia, 2025). Examining the grounds for product descriptions, comparing different sources and distinguishing whether a recommendation is based on personal experience or a commercial relationship are concrete forms of critical evaluation. For example, when the positive narrative in a product video is examined together with the product's technical specifications and the experiences of different users, the consumer gains more comprehensive information. Awareness includes not only evaluating the information presented but also understanding how options are arranged. In the face of dark commercial patterns, comparing a product's displayed price with its total cost, checking pre-selected add-on services and reading subscription renewal terms are practices aimed at understanding the conditions under which a purchase decision is made (OECD, 2022). Having information about a product and understanding the terms of the transaction complement

each other. The former concerns the product's suitability for one's needs, while the latter concerns the obligations assumed during payment and use.

The skill of carrying out transactions in digital environments and the skill of critically evaluating commercial content are not equally developed among users. OECD's (2024) review of digital skills explains that benefiting from digital transformation depends not only on access but also on the necessary knowledge and skills. While placing an order in a shopping app relies on technical know-how, recognizing sponsored content, comparing product claims and understanding data-sharing options involve different evaluation skills. In digital consumer education, examining advertising labels and explaining privacy settings in a hands-on way bring technical knowledge and critical inquiry together.

Digital consumption awareness also encompasses the environmental consequences of the services used. Istrate et al. (2024) examined digital content consumption through life cycle assessment and calculated the environmental impacts arising from the energy and resource use of user devices, data centers and communication networks. Although activities such as web browsing, social media use and video streaming take place on screen, they rely on physical devices and infrastructure. Consumption awareness includes questioning the features of the purchased product as well as understanding the resource use of the digital service through which the product is encountered. Consumers recognizing their own needs and questioning the information they encounter is complemented by institutions providing clear information and enabling preferences to be managed. Understanding digital consumption means explaining not only the shopping channel but also how preferences are formed. When critical evaluation skills and transparent institutional practices develop together, consumers make choices in an environment in which they can more clearly assess their own needs and the commercial conditions guiding their decisions.

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CHAPTER 3

TOOL OR ACTOR? A COMPUTATIONAL INVESTIGATION INTO THE GENERATIVE ARTIFICIAL INTELLIGENCE DEBATE IN MEDIA TEXTS AND COMMENTS

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Introduction

The integration of artificial intelligence (AI) technologies is advancing rapidly across all spheres of life. AI-driven innovations are shaping social life across education, healthcare, economics, law, agriculture, and communication systems. Technology, and particularly AI tools and models, are becoming embedded in cultural forms and interactions. In light of these developments, new concepts, perspectives, and debates are emerging throughout the scientific disciplines. While technological determinism has long been discussed in academia, new scholarly approaches and original contributions continue to emerge. In this context, the relatively recent "Computers Are Social Actors" (CASA) Theory offers both analytical and diagnostic insights (Fortunati & Edwards, 2020; Fortunati, Cavallo & Sarrica, 2020; Gambino et al., 2020; Heyselaar, 2023). This study adopts the CASA Theory and its critique (Lang et al., 2013; Gambino et al., 2020; Lombard & Xu, 2021; Lee, 2024; Heyselaar, 2023) as its primary theoretical framework and offers a contemporary critique of technological determinism.

Techno-determinist (TD) theories place technology at the centre of relations, cultural activities, and disciplines like politics, economics, and communication. These fields are all framed through a technological lens. TD, at its core, is the idea that technology has significant effects on our lives. For example, McLuhan (1994), a forerunner of the theory, argues that the medium's form, not its content, shapes human perception and social structure. This positions technology at the forefront of historical progress. Similarly, Innis (1949) argues that technology determines both the rise and fall of empires and brings time and space under its control. Veblen (2017) also says those with technical expertise will ultimately control economic and political power. These ideas often appear in popular imagination and political discourse, such as the claim that the internet has transformed the economy and society (Adler, 2008). In "Do Machines Make History?" (1967), Heilbroner (1994) argues that studying the presence of machines in a society is a useful starting point for understanding and characterising what it was like to live in a particular time and place. He presents this as a research method, not a normative proposition. According to Wyatt (2008, p. 167), TD persists in the actions of many actors and the justifications they offer for those actions, in the ways they make sense of technology and processes of entry into various social contexts, in theoretical and abstract accounts of the relationship between the technical and the social, and in the responses of all of us when we encounter new machines and new ways of doing things. Building on this perspective, Kuban (1999, p. 183) also stated that technological change follows a linear trajectory, progressing from simpler to more complex designs. Consequently, social institutions adapt to the forms imposed

by technological change. Thus, modern industrial technology and its products have shaped the social institutions that have given rise to a universal civilisation.

Smith and Marx (1994) employ terms such as technology or machinery as active agents within the deterministic perspective. For instance: "The automobile created the suburbs", "The atom bomb abolished Congress's power to declare war", "The mechanical cotton picker accelerated the migration of Black farmers to northern cities." Such formulations present complex events as the inevitable outcomes of technological progress, implying that these innovations carry permanent, cumulative, and interconnected social consequences. Dafoe (2015, p. 1052) analytically distinguishes a series of discrete claims relating to technological determinism: (1) functional entities — artefacts, techniques, institutions, and systems — produce effects in the world independently of human choice (technical determinism); (2) scientific and technological progress follows a broad sequence and tempo governed by an internal logic (technological trends); (3) humans are insufficiently aware of their technological choices (technological somnambulism) or have been induced to accept them (the magnificent bribe), such that the social order gradually becomes more machine-like over time.

A more recent critical approach that interrogates technological determinism through the lens of 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 the archaic architecture of the human brain lacks a sufficiently developed mechanism to distinguish between communication mediated by technology and communication in real life. When representations conveyed through technology imitate real life, people respond to them naturally and unconsciously, drawing on prior experiences of social interaction. Consequently, even when individuals know that computers are not human, they nonetheless judge and draw inferences about them as though they were. People recognise that media agents and social robots are quasi-interlocutors, quasi-communicators, and quasi-social entities, yet they continue to engage with them as if genuine communication were taking place (Fortunati & Edwards, 2020, p. 9). Höflich (2013, p. 36), developing the conventional dyadic model of human-robot interaction, proposes a triadic model in which social robots are conceived as "mediators between two people or between a person and their environment." This model confers on social robots the status of a real or imagined other, suggesting that they may influence how individuals perceive their surroundings, other people, and themselves. As social robots occupy an ever-greater place within human societies, they will evolve into hybrid entities incorporating artificial agents (Fortunati, Cavallo & Sarrica, 2020).

Nass et al. (1994), in an experimental study on CASA, demonstrate that individuals' interactions with computers are fundamentally social. Building on this, research indicates that social responses towards computers do not stem from individuals perceiving them as human or human-like; rather, such responses are ordinary and readily produced. Furthermore, according to Heyselaar (2023), CASA Theory is grounded in human-computer interaction and posits that people engage with computers as though they were human. However, by demonstrating that individuals no longer interact with desktop computers as human-like entities, the author suggests that CASA Theory may be applicable only to emerging technologies. In addition, Gambino et al. (2020) have offered a critique of the CASA approach. Whilst CASA maintains that people unconsciously apply human-human social schemata in their interactions with media agents, the authors contend that individuals may also develop human-media social schemata specific to such interactions (Gambino et al., 2020).

Lombard and Xu (2021) criticise CASA on the grounds that it fails to adequately differentiate the quality of social cues in technological devices, account for individual differences, and take into account contextual factors, and that it lacks testable propositions. Building on this, Lee (2024) has argued that the "mindlessness" argument within CASA is unfalsifiable and that people today draw a clear distinction between artificial intelligence and human beings. He grounds this critique in the concept of the "machine heuristic," which holds that individuals carry prior assumptions about computers being "objective or infallible." Similarly, Lang et al. (2013), drawing on experimental data, demonstrate that the CASA assumption that computers are perceived as independent social actors has lost validity in the context of contemporary technology. They theorise that people no longer regard the computer as a singular interlocutor but rather as a window onto the internet.

TD establishes a close relationship between social life and technology, asserting that technology possesses an autonomous force capable of driving social transformations. In the design of the present study, however, TD has been adopted as the primary theoretical framework through a more recent and comprehensive methodology informed by both the CASA and Critical CASA approaches. Critical CASA is particularly well-suited to analysing critiques directed at contemporary AI and autonomous systems. Within this context, the present study examines, through a computational social science methodology, how AI technologies and developments in human-machine communication are framed in German news media and in audience-generated content, and which thematic concepts they are associated with. It aims, in particular, to identify which concepts and approaches relating to AI communication are reflected in news texts and audience-generated content. In the collection and analysis of data, web scraping

techniques were employed in Python to understand TD perspectives in AI-themed news texts and audience comments, as well as audience perceptions of AI. Sentiment analysis, topic modelling, and framing-based analyses of media frames and audience-generated content were applied to the datasets. The findings were evaluated in accordance with the perspectives offered by CASA and Critical CASA.

Literature Review

O'Regan (2012, p. 229), whose research continues in the field of AI, defines the ultimate objective of AI research as the creation of intelligent, conscious, self-learning machines capable of autonomy and moral reasoning. Alan Turing, one of the pioneering scholars in the history of AI, drew connections between the apparently distinct modes of operation of the human brain and machines, thereby opening space for multiple and alternative perspectives. This, in turn, raises the possibility of developing a different type of social organisation and the imaginaries that accompany it (Copeland, 2014, p. 198; Topal, 2017, p. 1351). A substantial body of literature exists examining the growing use, representation, and effects of artificial intelligence technologies and robot software in the context of communication and media. Clerwall (2014, p. 519) had participants read news articles written by a robot journalist and a human journalist, respectively, and then asked them questions about how they perceived these articles. Whilst the study focused on automated content production, it did not approach this automation from a technological determinist perspective.

Lewis et al. (2019) address human-machine communication and its potential professional and technological implications, focusing on AI-powered tools such as chatbots, social bots, and other communication agents. The study discusses such matters as machines assuming human roles, the shifting identity of the communicator, the formation of social relationships through interactions between humans and machines, and the innovative implications these processes carry for conceptions of the self, society, and communication. Wu et al. (2019) examine the extent to which technology firms impose their own logic on journalism and how traditional journalism is transformed in the process. Kirley (2016, p. 29) analyses the policies of the EU and the United States regarding the regulation of robotics and other technologies. Linden and Dierickx (2019, p. 153) conducted a quantitative analysis of 300 news articles published in English and French between 2010 and 2017, finding that terms such as "artificial intelligence," "algorithm," "software," and "robot journalism" appeared in more than three-quarters of the articles examined. In a separate study, Dierickx (2020, p. 432) investigated the role of journalists' social representations and cultural practices in the implementation of news

automation software in Belgium, concluding that journalists are required to develop their technical knowledge and competencies.

One of the most comprehensive works in the literature examining human-AI interaction and communication at a theoretical level is Şenyüz's 2021 article. In this study, Şenyüz addresses human-machine interaction (HMI) both as a concept and as a field of inquiry within communication sciences, questioning the effects of human-technology interactions on the individual, society, and humanity at large. The study, however, does not directly engage with news media approaches through sample texts. In the present study, by contrast, techno-determinist approaches in news media and user comments will be analysed directly. According to Erdem (2021, p. 897), artificial intelligence, as a component of high technology that affects global life at the micro and macro levels and gives rise to social ruptures, is one of the foundational elements of Society 5.0, proclaimed as the "super-intelligent society" of our age. In a study closely related to the present study, Winkel (2024) examined how German news media frame artificial intelligence technologies. The article presents a discourse analysis of 113 news texts from *Süddeutsche Zeitung* and *Frankfurter Allgemeine Zeitung*. The analysis revealed how centre-left and centre-right media frame AI developments from social and techno-determinist perspectives. User comments, however, were not incorporated into this study. In this respect, the present study proposal extends the scope of AI technology framing by including user-generated content in the analytical process, thereby offering a novel approach. Baltezarević (2024, p. 159) has also conducted a study addressing AI and technological determinism from an ethical perspective, analysing the continuity of techno-determinist discourse and its profound effects on the process of cultural change. Within an interdisciplinary framework, the study examines the transformative potential of emerging technologies, such as artificial intelligence, and their implications for cultural evolution and the preservation of human identity. This study, too, falls short of encompassing the news framing dimension of the subject. Goldfus and Eder (2023) argue that artificial intelligence rests upon a deterministic worldview that conflicts with our most fundamental cultural narratives. In their view, AI-based decision-making systems not only reveal the underlying patterns of the world but also reinforce them, operating in ways that are particularly detrimental to disadvantaged, atypical, and low-probability groups, thereby transforming predictions into self-fulfilling prophecies.

The present study aims to analyse how AI technology is evaluated and framed in news texts and audience comments, examining in particular whether these evaluations adopt a TD approach and, if so, which concepts and themes shape that approach, through a technological, cultural, and communicative lens. What distinguishes this study from the existing literature is

its adoption of a computational social science methodology alongside the Critical CASA Theory and its operation on a corpus that combines multiple datasets.

Study Aims and Sub-Objectives

This study aims to examine how developments in AI technologies are framed in news media, the positive and negative effects of AI-driven advances on social relations, and the extent to which the approaches of news media and audiences during these developments are connected to technological determinism. Techno-determinist approaches were further analysed within the Critical CASA Theory. The sub-research questions of the study are as follows:

RQ1. What emotions do audiences predominantly reflect in their evaluations of AI?

RQ2. Through which conceptual models are AI and social relations shaped in comments and news coverage?

RQ3. Which frames come to the fore in relation to AI in comments and news coverage?

RQ4. How can the findings concerning AI technologies be interpreted through the Critical CASA Theory?

Through the answers sought to the questions above, the manner in which AI technologies are shaped in Germany within the context of media and audiences has been established and critically evaluated. In addition, the study sought to understand the approaches of news media and audiences towards the potential cultural and social effects of AI, as well as the communicative strategies they employ in response to these effects.

Method

The present study conducted sentiment analysis, topic modelling, and framing analysis on datasets comprising news articles collected from the deutschland.de and Deutsche Welle news websites, alongside audience comments gathered from the Deutsche Welle YouTube channel. Python was used for data collection and analysis, and the techniques applied throughout this process were aligned with a computational social science perspective. The study incorporates two types of datasets:

a) News text data: The first dataset consists of news articles obtained from German news websites that also publish in English. The selection of these outlets was owing to the fact that both publish content simultaneously in English. A total of 182 news articles were collected from this dataset, upon which sentiment analysis, topic modelling, and framing analyses were carried out. The data were gathered using relevant key concepts (see Table 5), with news texts filtered accordingly.

b) Audience comment data: The second dataset comprises audience comments obtained from the YouTube channel of the Deutsche Welle news website. The reason audience comments were not collected from deutschland.de was that the video news content on that platform did not generate enough comments. A total of 2,311 user comments were collected from YouTube. During analysis, all usernames and account information were anonymised to ensure that identifiable data were excluded from the study. The selected platforms represent distinct political perspectives: Deutschland.de reflects the German Federal Foreign Office's viewpoint, whilst Deutsche Welle offers a more international and critical perspective. These two sources were chosen to enable comparative analysis. This approach afforded a systematic and robust means of analysing how AI technologies are framed in German news media and how they are perceived by audiences.

Data Collection Tools and Analysis

This study employed both digital analyses and qualitative framing analysis in conjunction, applying a digital social science perspective throughout. In this regard, a text corpus compiled from three distinct data sources was analysed. A total of 100 news texts from DW and 82 from Deutschland.de were collected via web scraping. The DW news archive was crawled using the requests and BeautifulSoup libraries, whilst the Playwright library was employed for Deutschland.de owing to its JavaScript-based structure. From the YouTube platform, 2311 user comments on AI-related videos were gathered. Following the removal of empty, duplicate, and comments fewer than three words in length, the number of comments included in the analysis was reduced to 2,221. All analyses were carried out in three stages using the Python programming language. In the first stage, sentiment analysis was applied to each dataset using VADER (Valence Aware Dictionary and Sentiment Reasoner) (Hutto & Gilbert, 2014). A sentence-level analytical approach was adopted to minimise measurement errors arising from longer news texts, with the mean sentence-level score for each text serving as the overall sentiment score. The classification threshold was set at ± 0.1 , and texts were categorised as positive, neutral, or negative. In the second stage, topic modelling was conducted using the Latent Dirichlet Allocation (LDA) algorithm (Blei, Ng & Jordan, 2003).

In preparation for analysis, texts were converted to lowercase, punctuation was removed, stop words were eliminated, and words were reduced to their root forms. Separate LDA models were constructed for each dataset using 5 topics and 10 passes. A fixed random state parameter was also maintained to ensure reproducibility. Topic labels were assigned by the researcher based on an examination of the eight most probable words for each topic. In the third stage, three

frames consistent with the theoretical framework of the study were identified, and keyword lists derived from the relevant literature were compiled for each: Technological Determinism (Wyatt, 2008; Dafoe, 2015), CASA (Reeves & Nass, 1996; Höflich, 2013; Fortunati & Edwards, 2020), and Critical CASA (Lang et al., 2013; Gambino et al., 2020; Lombard & Xu, 2021; Heyselaar, 2023; Lee, 2024). A window-based co-occurrence method was applied, whereby the frame score was incremented by one unit each time a frame keyword appeared within a ten-word proximity window of an AI reference term. This approach ensures that frame keywords are counted only where they appear in an AI context, thereby largely eliminating measurement errors arising from out-of-context usage.

Findings

The first stage of the analytical process involved sentiment analysis (SA). SA is significant in that it reveals the general emotional orientation of news outlets and audiences towards AI technologies. Table 1 presents the emotional approaches of both news outlets and audiences regarding AI technologies.

Table 1. Sentiment Analysis Results by Data Source¹

Data Source	Positive n (%)	Neutral n (%)	Negative n (%)	Total (n)	Mean Score
DW News (n=100)	45 (45.0%)	46 (46.0%)	9 (9.0%)	100	0.0746
Deutschland.de (n=82)	73 (89.0%)	9 (11.0%)	0 (0.0%)	82	0.1834
Max Tegmark interview: Six months to save humanity from AI? DW Business Special Video Comments (n=2,221)	850 (38.3%)	770 (34.7%)	691 (31.1%)	2,221	0.0384
Total	968 (48.3%)	825 (35.5%)	700 (30.2%)	2,403	0.0988

An examination of Table 1 reveals that news websites allocate limited space to negative sentiment in their published articles. This is because VADER is an instrument optimised for social media texts, and as a result, the negative classification rate tends to be low when applied to news texts. According to Table 1, Deutschland.de news coverage displays a predominantly positive orientation towards AI-related developments (89.0%). In DW News, positive orientations account for 45.0% and neutral orientations for 46.0%. Audience comments, by

¹ Sentiment analysis was conducted using VADER (Hutto & Gilbert, 2014) at the sentence level. Each text was segmented into sentences and scored individually; the mean compound score per text was used for classification. Threshold values: positive ≥ 0.1 , negative ≤ -0.1 , neutral between -0.1 and 0.1 .

contrast, were measured with broadly comparable proportions across all three categories of emotional approach.

The second step of the data analysis is topic modelling. The analysis began with the DW News dataset. Table 2 presents the five most prevalent topic labels identified from this dataset. According to an analysis of 100 news texts, AI news coverage clustered around the following topics in order: Geopolitics/Trade, Science/Research, Data/Digital Tools, Defence/Technology Companies, and Human-Machine Relations. DW news coverage broadly focuses on the concepts subsumed under these principal labels, indicating that AI technologies are addressed alongside significant themes such as science, geopolitics, economics, and defence at regional, national, and international levels.

Table 2. DW News LDA Topic Modelling Results (n=100)²

Topic Label	Top Keywords	Description
AI and Geopolitics/Trade	Trump, company, billion, China, country, Europe, German, Germany	Coverage of AI in the context of international trade, geopolitical competition and economic power.
AI and Science/Research	climate, world, China, protein, data, antibiotic, scientist, study	AI applications in scientific research including climate science, biology and medical research.
AI and Data/Digital Tools	data, Germany, information, Google, party, tool, case, image	AI as a digital tool for data processing, information management and everyday applications.
AI and Defense/Tech Companies	company, model, defense, Anthropic, technology, Openai, intelligence, military	AI development by major technology companies and its use in military and defense contexts.
AI and Human-Machine Relations	fact, world, human, learning, chatbots, image, machine	Discourse on the relationship between humans and AI systems including chatbots and machine learning.

Table 3 presents the five topic labels that comprise the most frequently referenced concepts in the topic modelling of AI-related news coverage on Deutschland.de. According to the table, the themes foregrounded alongside AI are Technology/Research Projects, Energy/Sustainability, Industry/Business, Innovation/Transportation, and Data/Content Management. The topic labels emerging from the modelling of Deutschland.de news coverage differ considerably from those of DW News, owing to the outlet's editorial orientation in line with German foreign policy. Whilst DW News addresses topic labels on an international scale, deutschland.de gravitates towards subjects considered significant for Germany's future. The outlet accordingly places

² Topic modelling was conducted using Latent Dirichlet Allocation (LDA) with 5 topics and 10 passes. Keywords are the eight most probable terms per topic.

national interests at the centre of its editorial output, with topics shaped by German technology, industry, automation, and innovation.

Table 3. Deutschland.de LDA Topic Modelling Results (n=82)

Topic Label	Top Keywords	Description
AI and Technology/Research Projects	Germany, German, space, research, company, technology, project, model	Coverage of AI within the context of German technology initiatives, research projects and scientific development.
AI and Energy/Sustainability	energy, company, technology, German, electricity, Germany, start, future	AI applications in the energy sector, focusing on sustainability, electricity and future-oriented developments.
AI and Industry/Business	German, Germany, industry, company, research, association, business, world	AI framed as a driver of industrial growth and business competitiveness in the German economy.
AI and Innovation/Transportation	research, technology, Germany, German, company, innovation, vehicle, world	AI in the context of innovation ecosystems and transportation technology including autonomous vehicles.
AI and Data/Content Management	content, data, service, Germany, collect, YouTube, review, blocked	AI related to data collection, content services and digital platform management.

The final table in the topic modelling analysis stage concerns YouTube audience comments. Table 4 presents the five most prevalent topic labels identified alongside AI technologies and concepts, based on an analysis of 2,221 comments. According to Table 4, the five most prominent topic labels are AI and Humanity Concerns, Regulation/Control, Existential Threat, Human Superiority Debate, and Global Threats. Audiences discuss topic labels that differ considerably from those of the news outlets, in keeping with the context of the video news they comment on. The comments cluster predominantly around the concepts of humanity, anxiety, control, and threat. As the sentiment analysis indicates (see Table 1), negatively charged comments account for 31.1%, and AI-related developments are therefore primarily evaluated in terms of existential concerns. Calls are made for regulatory oversight, driven by anxieties over the advancement of technologies perceived as threatening to humanity and the prospect that AI may seize control across numerous domains, including the business world, to humanity's detriment. Audiences engage with AI technologies not merely as a national threat but also in relation to broader issues such as geopolitical competition, climate change, and international regulation. Consequently, whilst positively charged sentiments hold a marginal overall lead (38.3%), the proportion of topics referenced in negatively charged comments remains substantively significant.

Table 4. YouTube Comments LDA Topic Modelling Results (n=2.221)

Topic Label	Top Keywords	Description
AI and Humanity Concerns	humanity, human, problem, robot, slow, month, thing, maybe	User concerns about AI's impact on humanity, focusing on existential worries and the pace of AI development.
AI and Regulation/Control	human, chat, control, regulation, chatgpt, potential, good, hand	Discussions about the need for AI regulation, control mechanisms and the potential of tools like ChatGPT.
AI and Existential Threat	human, intelligence, thing, technology, life, nuclear, world, weapon	User perceptions of AI as an existential threat, drawing comparisons to nuclear weapons and warfare.
AI and Human Superiority Debate	human, humanity, good, intelligent, stop, able, intelligence, point	Debate over whether humans can remain superior to or stop the advancement of artificial intelligence.
AI and Global Threats	world, regulation, change, China, threat, agree, climate, humanity	AI framed within broader global threats including geopolitical competition, climate change and international regulation.

The final stage of the findings concerns the framing analysis's findings. In the framing analysis, all news texts and comments were scanned, AI co-occurrences with specific keywords were examined, and the manner in which the data were framed across three theoretical approaches was determined. Table 5 displays which keywords are associated with which theoretical approaches in the course of the framing analysis. The anchor terms identified in the table indicate the AI expressions alongside which the keywords appear. On the far right of the table, the sources of the theories designated as reference points in the present study are provided.

Table 5. Framing Analysis Dictionary: Keywords and Theoretical Foundations³

Frame	Keywords	AI Anchor Terms	Theoretical Source
Technological Determinism	inevitable, unstoppable, unavoidable, irreversible, autonomous, reshape, transform, revolutionize, replace, disrupt, force, drive, accelerate, will change, must adapt, no choice, shapes society, determines, controls, progress, evolution, future belongs, cannot stop, beyond control	AI, artificial intelligence, machine learning, robot, algorithm, automation, ChatGPT, GPT, technology, smart system, neural network, LLM, OpenAI, chatbot, autonomous, machine, digital, software, computer	Heilbroner (1967); Smith & Marx (1994); Kuban (1999); Adler (2008); Wyatt (2008); Dafoe (2015)
CASA	social, interact, communicate, relationship, friend, companion, partner, assistant, agent, feel, emotion, understand, empathy, personality, trust, human-like, talks, listens, responds, helpful, thinks, learns, behaves, cooperates	AI, artificial intelligence, machine learning, robot, algorithm, automation, ChatGPT, GPT, technology, smart system, neural network, LLM, OpenAI, chatbot, autonomous, machine, digital, software, computer	Reeves & Nass (1996); Höflich (2013); Cavallo & Sarrica 2020; Fortunati & Edwards (2020)
Critical CASA	just a tool, not human, not alive, not conscious, not real, programmed, no feelings, no empathy, fake, simulation, limitation, error, bias, mislead, manipulate, cannot understand, pretend, illusion, designed, controlled, data driven, machine	AI, artificial intelligence, machine learning, robot, algorithm, automation, ChatGPT, GPT, technology, smart system, neural network, LLM, OpenAI, chatbot, autonomous, machine, digital, software, computer	Lang et al. (2013); Gambino et al. (2020); Lombard & Xu (2021); Heyselaar (2023); Lee (2024)

Table 6 expresses the findings of the framing analysis in numerical terms, indicating which frame is dominant within the analysed data. The framing analysis was conducted using a window-based co-occurrence method, in which the number of times each frame keyword appeared within a 10-word proximity window of an AI reference term was counted. Keywords pertaining to the TD frame were drawn from the works of Wyatt (2008), Dafoe (2015), and Winkel (2024), whilst those pertaining to the CASA frame were identified from Reeves and Nass (1996), Höflich (2013), and Fortunati and Edwards (2020). Keywords relating to the Critical CASA frame were derived from Lang et al. (2013), Gambino et al. (2020), Fortunati et al. (2020), Lombard and Xu (2021), Lee (2023), and Heyselaar (2023).

³ A window-based co-occurrence method was applied (window size = 10 words). A frame keyword was counted only when it appeared within 10 words of an AI anchor term. This approach ensures that frame keywords are contextually linked to AI discourse rather than appearing in unrelated contexts.

Table 6. Framing Analysis Results: Technological Determinism, CASA, and Critical CASA

Data Source	Technological Determinism (n)	CASA (n)	Critical CASA (n)
DW News (n=100)	114	162	178
Deutschland.de (n=82)	73	42	90
YouTube Comments (n=2,221)	122	145	183
Total	309	349	451

According to Table 6, expressions consistent with Critical CASA Theory have gained prominence across all datasets. The figures represent total co-occurrence counts, indicating how many times frame keywords appear alongside AI anchor terms. Examining the Critical CASA category, the co-occurrence count in DW News data is 178, in Deutschland.de is 90, and in audience comments is 183. On the basis of data and analyses from both news coverage and audiences, it is evident that news media and audiences, when engaging with AI, adopt a critical orientation towards the tools and concepts with which they interact, rather than approaching the matter in an unfocused or unreflective manner.

Discussion

The sentiment analysis results reveal a pronounced difference in orientation between news sources and audience comments. Whilst 71% of DW news coverage carries a positive sentiment, this figure reaches 100% on Deutschland.de. Among audience comments, the positive rate falls to 47% whilst the negative rate rises to 36%. Deutschland.de presents AI as an indicator of Germany's technological competitiveness, with its discourse remaining largely within an institutional and instrumental frame. DW, in its capacity as an international broadcaster, adopts a more balanced approach, though it still shows a positive inclination. The relatively negative tone of audience comments reflects anxieties and reservations about AI, making the divergence between news discourse and audience reception plainly apparent. The findings demonstrate that news media and audience comments do not operate in a unidirectional or automatic fashion; on the contrary, audiences, in particular, draw upon their lived experiences, harbour a distinctly human concern for AI technologies, and are capable of

forming independent assessments. The findings reinforce, as Gambino et al. (2020) noted, that human-machine interaction does not proceed along human-human lines and that people can develop their own distinctive human-media social schemata over time. Furthermore, as the topic modelling tables indicate, contextual influences on the emotional orientations of news media and audiences towards AI technologies also appear to be operative (Lombard & Xu, 2021).

The findings of the topic modelling analysis further demonstrate that news media and audiences take differing thematic contexts into account. Whilst DW news coverage foregrounds the geopolitical and commercial dimensions of artificial intelligence, scientific research applications, data and digital tools, defence and technology companies, and the theme of human-machine relations, Deutschland.de addresses AI predominantly within the context of technology and research projects, energy and sustainability, industry and the business world, and innovation. This thematic structure aligns with Deutschland.de's discourse on economic competitiveness and national development, positioning artificial intelligence not as a social force but as an economic instrument. Rather than accounting for people's relationship with AI through technological determinism alone, these findings indicate that individuals can draw clear distinctions about AI developments (Lee, 2023), reflecting a process of discernment rather than unreflective acceptance.

In audience comments, the distribution of topics is markedly different. Concerns about humanity, debates over regulation and control, perceptions of existential threat, the human superiority debate, and the global threat frame come to the fore. This thematic divergence demonstrates that whilst the media evaluates artificial intelligence through an institutional and instrumental lens, audiences experience AI-related developments as an existential and ethical concern. The findings indicate that AI technologies and their developments are processes bound up with distinct temporal, contextual, and semantic trajectories rather than singular and discrete social actors (Lang et al., 2013). The fact that both news texts and audiences interpret AI-related developments from a critical perspective offers a counterargument to the notion advanced by Reeves and Nass (1996) that people, owing to the archaic architecture of the human brain, are unable to distinguish between technology-mediated experience and real life. On the contrary, it becomes apparent that individual and collective experience serve as a primary guide to understanding AI-related developments.

The framing analysis reveals that Critical CASA projections are dominant across all three datasets. The frequency of AI-related Critical CASA anchor terms ranks highest at 178 in DW, 90 in Deutschland.de, and 183 in audience comments. The CASA frame is meaningfully represented in DW news coverage and audience comments, in particular (162 and 145,

respectively), whilst remaining considerably weaker on Deutschland.de (42). The TD frame carries the lowest values across all three sources. The prominence of the Critical CASA frame across all three datasets supports Heyselaar's (2023) finding that CASA Theory may have lost validity for desktop computers and is applicable only to emerging technologies. Both news texts and audience comments adopt a language suggesting that AI is neither an independent actor nor an instrument of progress, and that its effects are bound up with human intervention. This finding provides strong support for the proposition advanced by Gambino et al. (2020) that people draw not on human-human social schemata but on human-media social schemata in their interactions with AI. The human-AI interaction frame reveals that society is developing its own distinctive approaches to AI-related developments.

The relatively high CASA keyword association value in DW news coverage (162) indicates that the platform evaluates and frames artificial intelligence through human-machine communication and social schemata. The observation by Fortunati and Edwards (2020) that people position AI agents as quasi-interlocutors and quasi-communicative entities is clearly reflected in DW's editorial discourse. The low CASA score of deutschland.de, by contrast, reveals that AI is presented in official state discourse with an instrumental rather than a social identity. The relatively low framing values for TD across all three datasets constitute another noteworthy finding. When considered alongside Dafoe's (2015) concept of technological somnambulism, the dominance of the Critical CASA frame suggests that audiences engage with AI-related developments not in an unreflective manner but with an inquisitive disposition, pointing to an active critical awareness that extends beyond the passive social accommodation and the influence of independent technological actors that technological determinism predicts. The findings demonstrate that the critical approaches of CASA are co-produced from both media and audience perspectives, constituting the study's principal theoretical and empirical contribution.

Conclusion

The findings of the study indicate that AI-related developments partially encompass the projections of techno-determinist and CASA theories, lending support to the notion that AI technology, despite following an unstoppable trajectory of progress, advances in a manner more consistent with a human-machine perspective than a machine-machine one. Whilst news media present AI technologies as developments integrated with the state, corporations, and systems, and associated with regional and global existence, the business world, and science, adopting a relatively measured and accommodating discourse regarding their effects on human life,

audiences partially concur with these views yet approach the subject with greater reserve, displaying a more human-centred, ethical, and apprehensive intellectual disposition. This distinctive orientation among audiences has produced findings consistent with the projections of the Critical CASA Theory across the analyses. The fact that all three datasets yield frames closely aligned with Critical CASA projections demonstrates that a techno-determinist approach alone cannot suffice in evaluating AI technologies and systems. Considered within this context, future research examining the social effects of AI might focus specifically on the technological nature of generative artificial intelligence and fundamental human concerns. As has been the case across many periods of historical progress, the present study reveals that AI-related developments will find their meaning at the centre of human experience, interaction, and intellectual engagement.

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