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LEAD ARTICLE

From banking and telephony to media: The case of Russian digital ecosystems

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Abstract

This article examines media resources within Russian digital ecosystems (RDESs) for which the media industry has never been a core business and which are now actively expanding their presence in this area: Sber, MTS, and T-Technologies (T-Bank). It discusses how each of the analyzed non-media companies has transformed into a digital ecosystem in recent years, not least through the development of their own or partner media resources. It also shows the differences between the media resources within the analyzed DESs and the social media functions performed by the media resources within these ecosystems.

Keywords

Digital platforms, digital ecosystem (DES), media resources, digital media communications, network effect, multi-sided markets, media functions.

Introduction

The dynamics of media development at the present stage are determined by convergence with the advertising, telecommunications and IT industries, technological integration of previously separate segments of the media system, the growing importance of big data for the functioning of media companies, increased interactivity of social and interpersonal communications mediated

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by media, and changes in audience demand for content and services of digital media (Vartanov, 2023a, 2023b; Vartanova, 2022). In the early 2020s, digital platforms operating as full-fledged digital ecosystems (DEs) took a special place in the modern digital environment (Tyshetskaya, 2024, 2025). Such ecosystems traditionally include five large, diverse entities of the Russian economy: Yandex, VK, Sber, T-Technologies, and MTS, although their list is increasingly being expanded to include other economic entities – marketplaces^{2 3}.

Today, the media resources of the Digital Ecosystems are becoming popular sources of media content for the audience, providing them with the opportunity to watch TV series, films and TV shows, and listen to audio programs (Tyshetskaya, 2024, 2025). They offer not only original content produced for the platforms' own OTT or podcast services, but also access to content from traditional media – press, news agencies, radio stations, and television channels. Such strategies are specific not only for social networks that have become digital ecosystems, such as Yandex and VK, but also for those DEs that originate from non-media industries (finance, telecom, e-commerce), such as Sber, T-Technologies, and MTS⁴.

DEs are beginning to compete with traditional media for audience time and attention. By the end of 2024, the total number of subscribers to Russia's largest online cinemas, which are part of national DEs, exceeded 58 million⁵. Domestic audio streaming services with ecosystem affiliation also boast high reach: 79.6% of residents of Russian cities with a population of 100,000 or more prefer to listen to music through them⁶. Total revenue from ecosystem subscriptions in Russia in 2024 amounted to 195 billion rubles (\$2.3 billion), with growth expected to reach 40.3% (273.4 billion rubles/\$3,25 billion) by the

² Yakov & Partners. Report “Artificial Intelligence in Russia – 2023: Trends and Prospects”. URL: <https://yakovpartners.ru/publications/ai-future/>

³ Reports “The Largest Russian Ecosystems” in 2020, 2021, 2022, 2023, 2024–2025. URL: <http://spektr.team/tpost/g8cbrog5l1-issledovanie-krupneishie-rossiiskie-tsif>

⁴ Reports “The Largest Russian Ecosystems” in 2020, 2021, 2022, 2023, 2024–2025. URL: <http://spektr.team/tpost/g8cbrog5l1-issledovanie-krupneishie-rossiiskie-tsif>.

⁵ IAA Telecom Daily: OK subscribers grew by 28% in a year. URL: <https://telecomdaily.ru/news/2025/02/25/iaa-telecomdaily-chislo-podpischikov-ok-za-god-vyroslo-na-28>.

⁶ J'son & Partners Consulting. The Russian streaming music services market. 2022–2024. Forecast to 2029. Analytical Report (August 2025). URL: <https://json.tv/analytic/rynok-strimingovyh-muzykalnyh-servisov-rossii-2022-2024-gody-prognoz-do-2029-goda/>

end of 2025⁷. In other words, in terms of audience attention, digital ecosystem media products have already reached a level comparable to traditional mass media. According to Mediascope, in 2024, Russians spent an average of almost 3 hours and 52 minutes daily on smartphone media consumption, with most of this time spent on media activities mediated or offered by ecosystem products⁸. For comparison, according to the same company, in the same year the average TV viewing time of Russians was 3 hours 22 minutes per day⁹.

Another challenge for traditional media has been the entry of the largest digital ecosystems into the advertising market: by the end of 2024, their combined advertising revenue was expected to account for nearly 80% of the total advertising market. Digital ecosystems are becoming a threat to traditional media companies in this area as well, since advertising revenue from them is flowing to bloggers, following the large audiences they attract¹⁰. As system-forming advertising platforms, the DESs themselves are also the largest advertisers¹¹. Another aspect of this process can be seen as the growing importance for audiences of alternative media content producers, access to which is also organized by digital ecosystems.

Digital ecosystems are becoming the source of technological media innovation and drivers of AI-based digital media transformation, transforming traditional social communication formats. Increasingly, media studies view digital ecosystems as infrastructural meta-entities that organize interactions between various media entities (Kretschmer et al., 2022; Vartanova, 2022; Tyshetskaya, 2025), and digital ecosystems themselves as the top level of media

⁷ The Russian ecosystem subscription market has quadrupled since 2021. *Vedomosti*, May 15, 2025. URL: <https://www.vedomosti.ru/media/articles/2025/05/15/1110169-rinok-ekosistemnih-podpisok-v-rossii-viros>.

⁸ A person in a smartphone 2024. Research by Mediascope. URL: https://mediascope.net/upload/iblock/a88/93gub0nnaudd6zkn9gc5g2zjiv1t2pb/%D0%A7%D0%B5%D0%BB%D0%BE%D0%B2%D0%B5%D0%BA%20%D0%B2%20%D1%81%D0%BC%D0%B0%D1%80%D1%82%D1%84%D0%BE%D0%BD%D0%B5_Mediascope.pdf

⁹ Media consumption 2024. Research by Mediascope. URL: https://mediascope.net/upload/iblock/f33/ual5i70kf7n9df7qzkq0gf238bidh3xv/%D0%9C%D0%B5%D0%B4%D0%B8%D0%B0%D0%BF%D0%BE%D1%82%D1%80%D0%B5%D0%B1%D0%BB%D0%B5%D0%BD%D0%B8%D0%B5%202024_%D0%9D%D0%90%D0%A2_27.08.2024.pdf

¹⁰ Russian Advertising Yearbook 2018. Ripol Classic, 2019.

¹¹ AdIndex. Advertising market in 2024: Volumes and major players. URL: https://adindex.ru/news/ad_budjet/2025/03/14/331685.phtml?ysclid=mfwf9b8qbh733350572.

platform development, transforming into environments for the formation and development of new types of communication within human communities (Srniczek, 2017).

Theoretical framework

Theoretical approaches to the DES as a new media communication phenomenon are currently interdisciplinary in nature and can be conditionally divided into three groups characterized by different epistemological natures: groups of predominantly economic, predominantly sociological, and predominantly media-theoretical concepts, which are used below by the authors to analyze the phenomenon of media platforms.

The term “ecosystem”, originating from biology, is widely integrated into economic discourse. Five main concepts of “ecosystems” are discussed: decision ecosystems, transaction ecosystems, business ecosystems, knowledge ecosystems, and platform ecosystems. It is the latter, which mediate interactions between independent producers and platforms, that are of greatest interest to us (Ifraimov, & Belova, 2023).

Digitalization has resulted in the digital transformation of economic relations (Vartanov, & Vardanyan, 2024; Muschert, & Shomotova, 2025; Wei, & Ong, 2025). The term “digital ecosystem” describes a type of socio-economic entity catalyzed by information and communication technologies (Nachira et al., 2002). Related to this is the duality of the nature of the digital ecosystem, which is based on digital architecture – a sustainable and scalable system consisting of “heterogeneous digital units and their interactions” (Li, Badr, & Bienner, 2012), and at the same time representing a business ecosystem – that is, an architecture of interacting teams, partners and other related social groups (Senyo, Liu, & Effah, 2019). Within this framework, the concept of the digital ecosystem is viewed not as an independent socio-economic and technological category, but as one of the stages in the life cycle of digital platforms – the top one, constituting both a technological and economic entity. The transformation of platforms into digital ecosystems becomes a general rule of their functioning, embodying the fundamental platform desire to expand their scope of activity and consolidate their “role as a gatekeeper-router” (Srniczek, 2017).

A key approach to understanding platforms is provided by the concept of two-sided, three-sided and multi-sided markets, which assume the existence of several heterogeneous groups of consumers whose needs are satisfied by the platform’s activities (Hagiu, & Wright, 2015; Rochet, & Tirole, 2003). The emergence of digital network technologies makes it possible to realize the idea

of a platform in the form of multi-sided online services (Athey, Calvano, & Gans, 2013; Hagiú, & Wright, 2015; Yablonsky, 2013). Throughout the history of the media industry, economic discourse has viewed the latter through the lens of the concept of a dual market of goods and services, linking entities of different types: the editorial board and its employees – journalists with advertisers, on the one hand, and with the audience, on the other (Picard, 2002; Castells, 2000). The last two types had different demands and needs, but it was the media that carried out intermediation and mediation, providing all the listed entities with opportunities and infrastructure for economic interaction (Vartanov, 2023a). Long before digital platforms emerged as economic actors, media companies had been shaping a two-sided market around themselves. With the emergence of digital platforms, market subjectivity expanded, and the platforms themselves became their primary structuring actors (Evans, 2003; Balandina, & Baskakova, 2016). According to a number of authors, the key economic effect of digital platforms is the generation of value through network effects by reducing transaction costs as the number of users increases (Parker et al., 2016; Moazed, & Johnson, 2016; Tyshetskaya, 2025).

Sociological discourse in the analysis of digital platforms draws attention to their functioning as intermediaries between numerous communities of participants, to the implementation of the idea of mass self-communication instead of traditional mass communication (Kolomiets, 2019). There is a need to create a new theoretical model of digital society, not simply by adding digital technologies to social relations, but by developing an understanding of it as a fundamentally different way of organizing sociality with a different epistemology (Dudina, 2019). Today, digital platforms are considered as forms of media that are used for communication purposes (Nazarov, 2020). Several researchers agree on defining a platform as a digital infrastructure that facilitates direct communication between authors (producers) and audiences (consumers) of content (as in the traditional media economy), as an entity that facilitates communication between various entities in a digital media communications environment. There is an assumption about the theoretical genesis of ideas about a digital platform from the concept of the “network society” by Castells (Srnicsek, 2017; Brynjolfsson, & McAfee, 2014; Castells, 2000; Tyshetskaya, 2024). Proposing various classifications of platforms (Moazed, & Johnson, 2016; Srnicsek, 2017), researchers speak of their growing influence on all aspects of consumption, primarily media consumption. This influence is characterized by increasing algorithmization, leading to the loss of traditional media’s influence on the formation of public opinion (Nazarov, 2020; Tyshetskaya, 2024, 2025). The algorithms used by digital platforms have recently become the subject of theoretical

discussion, although a consensus on the impact of recommendation systems on society has not yet emerged. On the one hand, there are claims that modern society is at the dawn of a new participatory culture (Jenkins, Ito, & Boyd, 2016). On the other hand, there are widespread views according to which digital media are tearing society apart into polarized parts, depriving it of integrity and systemicity, contributing to the “reassembling the social” (Keane, 2013; Latour, 2005).

With the digitalization of various aspects of mass communication, the discourse of media theory has also acquired new dimensions. The algorithms that underpin all digital platforms are creating “highly personalized gates” in the digital media environment: instead of professional editorial staff selecting news according to editorial standards, it is algorithms, acting as “information gatekeepers,” that create customized news agendas for users (Moeller, & Helberger, 2018). As online communication expands, previously distinct technological services for content production and distribution are integrating. This results in both an extensive increase in the volume of user-generated content and a transformation in its role in satisfying audiences’ informational and recreational needs (Athey, Calvano, & Gans, 2013). Digitalization is restructuring the architecture of the traditional media system, bringing non-institutionalized entities into the space of digital media communications and enhancing the potential of technology in content creation (Vartanova, 2022). A number of researchers have suggested that the performance of socially significant functions is diffusing, shifting to new content producers. Journalism, which once performed a range of socially significant and socially approved functions (Prokhorov, 2011), is being replaced by new professions lacking a clearly articulated ethos and principles of social responsibility. Control over them is shifting from society to the algorithms of technology companies and digital platforms (Vyrkovsky, & Makeenko, 2021).

Entering the digital media environment, modern digital platforms, the social nature of which is characterized by media-mediated communication and the use of digital media technologies and big data, not only form an intermediary in the interaction of representatives of various user groups: traditional media, advertisers and audiences (Tyshetskaya, 2024, 2025). They produce a digital multimedia product, through which they influence the media and even individual non-media everyday practices of their audience (Dunas, 2021; Nazarov, 2023).

Thus, the theoretical analysis of digital ecosystems, based on an interdisciplinary approach, combines several discourses: economic (platforms as new market mechanisms), sociological (the generation of new forms of social interactions and social effects) and media communication (the transformation of the architecture of the media system, the emergence of hybrid formats of professional and amateur content).

Study design

This article analyzes the activities of three cross-industry conglomerates for which media and advertising, historically not significant areas of activity, have gained interest in recent years. Sber, MTS, and T-Technologies (formerly Tinkoff) exhibit characteristics of a digital ecosystem (Tyshetskaya, 2025). Today, they offer users digital services and platform solutions within end-to-end integrated services, and are present in more than two markets/industries simultaneously under a single brand. *Table 1* presents the key characteristics of Sber, MTS, and T-Technologies according to the identified criteria (as of late 2024 – early 2025).

Table 1

Key characteristics of Sber, MTS, and T-Technologies

Description parameter	Sber	MTS	T-Technologies
Historically established priority area of activity	Financial services (banking)	Telecommunications	Financial services (banking)
Other current areas of activity (as of the end of 2025)	E-commerce; Media and entertainment; Health	Media and entertainment; Finance and financial technology	Media and entertainment; E-commerce
End-to-end integration services (as of end of 2024)	ID: Sber ID Subscription: Sber Prime Virtual Assistant: Salute Payment Service: SberPay	ID: MTS ID Subscription: MTS Premium Virtual Assistant: MTS Secretary (formerly Marvin) Payment Service: MTS Pay	ID: T-ID (Tinkoff ID) Subscription: T-Bank Pro Virtual Assistant: “Universe of AI Assistants” (Gen-T) (formerly “Oleg”) Payment Service: T-Pay

Source: Compiled by authors based on data from Spektr¹², annual reports and official press releases of companies.

¹² Reports “The Largest Russian Ecosystems” in 2020, 2021, 2022, 2023, 2024–2025. URL: <http://spektr.team/tpost/g8cbrog511-issledovanie-krupneishie-rossiskie-tsif>.

The areas of activity historically concentrated by the parent companies of the analyzed DESs remain the primary drivers of their revenue today. All three companies conduct significant activities in the “Media and Entertainment” segment, although not all of them highlight this in their annual financial statements. The analysis focuses on media communications resources owned by the aforementioned DESs or their partner media resources, accessed by audiences through IDs and ecosystem subscriptions. Media communications resources include traditional media (television, radio, print media), online media (websites, online cinemas, online radio, audiovisual streaming services), social media and search engines, media production companies (production studios, production centers, record labels, etc.), and advertising divisions.

The hypothesis is that digital ecosystems, through their media resources, which perform certain media-specific functions and compete for audiences and advertising with new and traditional media, can acquire the status of entities within the media communications industry.

In this regard, the following research questions were posed. First, how has each of the analyzed non-media companies transformed into a digital ecosystem in recent years through the development of their own or partner media resources? Second, what are the differences between the media resources of the analyzed digital ecosystems? Third, what social media functions do the media resources of the studied ecosystems perform?

An interdisciplinary approach is used to answer these questions, driven by the interdisciplinary nature of the research objects – digital ecosystems. Since their media communication assets are the subject of this study, the research lens of media theory plays a leading role in this article, supplemented, as necessary, by elements of the economic and sociological discourses described above. It should be noted that the answers to the posed research questions will only allow for the development of preliminary approaches to the typology of media communication assets of non-media digital ecosystems, as the structures under consideration are still rare in the Russian landscape (the total number of Russian digital ecosystems is only about ten). The approaches used in the work are aimed at the accumulation and primary systematization of data with the aim of further moving on to the search and analysis of stable functional relationships.

Mediacommunication resources of the Sber digital ecosystem

Sber is one of Russia’s largest digital ecosystems. As of the end of 2024, it encompasses approximately 100 different services and platform solutions,

including financial services, insurance, real estate, healthcare, information and navigation, media and entertainment, travel, education, and more. Sber's core business is banking services for businesses and individuals¹³. Net profit for 2024 amounted to 1,580.3 billion rubles (\$19.20 billion) in accordance with IFRS with operating income of 3,097.2 billion rubles (\$36.9 billion), the group's revenue from non-core activities amounted to 505.5 billion rubles (\$6.1 billion).

2017 can be considered the beginning of Sberbank's transformation into a digital ecosystem. According to the strategy approved at the time, the bank was to become a technology company by 2020. In 2020, the Sber brand was launched, and ecosystem development goals were announced by 2030: becoming one of the top three e-commerce market leaders, increasing the number of ecosystem subscribers to 10 million, and increasing the share of revenue from non-financial services by 30%¹⁴.

In 2023, as part of the presentation of its updated ecosystem development strategy, Sber declared the development and implementation of AI-based solutions as a top priority. That same year, Sber unveiled two neural network models for content creation: GigaChat and Kandinski. In 2024, it launched two more new services: GigaCheck and GigaLegal, along with a number of end-to-end integrated AI-based services.

In late 2024 – early 2025, Sber owned four media resource blocks: publicly accessible socio-political news resources acquired through the Rambler Group buyout; service and search resources, including the Rambler search and information portal (mixed access: public and subscription); partner streaming audiovisual services (access via the SberPrime ecosystem subscription); and media communications services based on artificial intelligence (mixed access) (see *Table 2*).

¹³ Summarized consolidated financial statements. Public Joint-Stock Company Sberbank of Russia and its subsidiaries for 2024 with independent auditor's report. URL: https://www.sberbank.com/common/img/uploaded/files/info/reporting_4q_pmz4bfhv_2024.pdf.

¹⁴ Presentation of the 2023 strategy. Public joint-stock company Sberbank of Russia. URL: https://www.sberbank.com/common/img/uploaded/files/info/sber_investor_day-strategy_2023_ru.pdf.

Table 2

Mediacommunication resources of the Sber ecosystem (as of 2025)

Resource type	Name	Description	Year of acquisition/creation	Priority social media function performed by the resource
News socio-political	Ferra.ru	Online magazine about consumer electronics	2020 (as part of the deal to buy out 100% of Rambler Group). In 2021, resources were allocated to Sberentertainment LLC.	Informational
	Lenta.ru	Online news publication		Informational
	Motor.ru	Website about cars		Informational
	Quto.ru	Online magazine about cars		Informational
	«Мослента» (Moslenta)	A website about life in Moscow		Informational
	«Секрет фирмы» (“Sekret Firmy”, Russian for “Secret of the firm”)	Online magazine about business in Russia		Informational
	«Чемпионат» (“Championat”, Russian for “Championship”)	Sports Internet portal		Informational

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Resource type	Name	Description	Year of acquisition/creation	Priority social media function performed by the resource
Service and search	Rambler.ru	Information and search portal (news aggregator, thematic sections, free email service, search engine)	2020 (as part of the deal to buy out 100% of Rambler Group)	Informational
	2GIS	Electronic directory with city maps	2020 (72% share purchased)	Informational
	СберПраво (“SberPravo”, Russian for “SberLaw”)	A service for resolving legal issues	2021 (own development. Created jointly with the Federal Chamber of Advocates of Russia)	Informational
	СберЮрист (“SberYurist”, Russian for SberLawyer”)	Automated tool for creating legal documents	2023, own development	Informational
Streaming audiovisual	Okko	Video streaming service	2020, acquired as part of the acquisition of 100% of Rambler Group. 2022, sold, included in the ecosystem subscription.	Entertainment
	«Звук» (Zvooq, Russian for “Sound”)	Audio streaming service	2020, 77% acquired. 2022, sold, included in the ecosystem subscription.	Entertainment

Resource type	Name	Description	Year of acquisition/creation	Priority social media function performed by the resource
Innovative AI-powered mediacommunication resources	GigaCheck	AI detector	2024, own development	Informational
	GigaLegal	Smart AI Legal Assistant	2024, own development	Informational
	Салют (Salut)	Smart voice assistant	2020, own development	Communicative
	«AI-помощник для вузов» («AI-pomoshchnik dlya vuzov», Russian for “AI Assistant for Universities”)	A universal AI assistant based on GigaChat MAX	2024, own development	Communicative
	GigaChat	Large Language Model (LLM)	2023, own development	Communicative
	Kandinsky	A neural network for generating images and videos based on text descriptions	2023, own development	Entertainment

Source: compiled by authors based on open sources, as well as official reports and press releases of Sberbank PJSC and its subsidiaries¹⁵.

Today, Sber possesses an impressive array of media communications resources, but the rationale for integrating them into the ecosystem is not always clear. Sber’s AI-powered media communications services are deeply integrated into the ecosystem and align with global trends, setting fundamentally new communications practices. Meanwhile, Sber’s other media communications assets are less integrated and either serve a supporting role or are completely externalized, operating autonomously. The primary function of streaming services as part of the ecosystem subscription is user acquisition and retention. They are not owned by the ecosystem’s parent company (they were sold in 2022 due to unfavorable geopolitical circumstances). The socio-political news media resources and the Rambler search engine appear

¹⁵ Sber Group results. Information on operational and financial indicators. URL: <https://www.sberbank.com/ru/investor-relations/groupresults>.

somewhat alien; their connections to other ecosystem services are unclear. They are not part of Sber's ecosystem subscription and pursue their own editorial and content policies. The only connection this group of assets has with the ecosystem is their ownership by Sberentertainment LLC.

Mediacommunication resources of the MTS digital ecosystem

PJSC MTS (Mobile TeleSystems), currently the largest telecom operator in Russia by subscriber base¹⁶, was founded in 1993 as a telecommunications company. Telecommunications remains its key business segment. 75% of the company's annual revenue is generated by this segment, but other business areas, particularly advertising and entertainment, are also showing significant growth. The latter are declared strategic in MTS's ambitions to occupy a significant place in the advertising market.

The "ecosystem" term first appeared in official MTS press releases in 2019, when the new *Customer Lifetime Value 2.0* strategy was adopted. Extending the customer's "lifetime" – the period during which they would use MTS-branded services – was declared a key priority. In 2024, MTS underwent a systemic transformation into a holding structure. All non-telecommunications divisions were spun off into a separate company, "MTS Ecosystems", which also included assets in the advertising, media, and entertainment sectors.

The first full-fledged media resource, the *MTS TV* video streaming service, was created in 2015. Since 2021, it has been the KION streaming service, for which the company produces exclusive content. The MTS Music music streaming service has existed since 2016, and since 2023, all music services within this ecosystem have been unified. In 2022, the Stroki electronic library and publishing house for paper and digital books were established. In early 2025, all major entertainment media resources were combined into the KION content cluster. MTS's advertising division was established in 2018. In 2023–2024, MTS began developing its gaming content divisions. In 2021, all ecosystem resources in the fields of information technology, artificial intelligence, cloud storage, and data management were consolidated into a separate business unit.

Currently, MTS's media communications resources include the following types: streaming audiovisual content, electronic libraries, AI-powered media communications resources, production, advertising, and gaming resources (see *Table 3*). Access to these resources is provided through an ecosystem subscription.

¹⁶ Fit to be a subsidiary: How MTS is building its ecosystem. Forbes Russia. September 11, 2024. URL: <https://www.forbes.ru/tekhnologii/520361-v-docki-godit-sa-kak-stroit-svou-ekosistemu-mts-pod-krylom-afk-sistema>

Table 3

Mediacommunication resources of the MTS ecosystem (as of 2025)

Resource type	Name	Description	Year of acquisition/creation	Priority social media function performed by the resource
Streaming audiovisual services	MTC Music	Video streaming service	2016, own development	Entertainment
	Kion	Video streaming service	2015 (as MTS TV), own development	Entertainment
Online libraries	«Строки» (“Stroki”, Russian for “Strings”)	Online library	2022, own development	Culturally formative
Production of original content	MTC Лейбл (MTS Label)	Full-cycle music company	2023, own development	Directly organizational
	Издательство «Строки» (Izdatelstvo “Stroki”, Russian for “Strings Publishing house”)	Multi-genre publishing house	2023, own development	Directly organizational
	MTC Live (MTS Live)	A full-service event agency (producing and promoting in-house events, ticket sales, and managing a network of concert venues)	2018, assets acquired as part of the deal to purchase ticket operators MDTZK and Cubichall	Directly organizational
	KIONFILM	A full-cycle production center and film production company	2025, created as a result of internal restructuring at the Kinopolis studio	Directly organizational

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Resource type	Name	Description	Year of acquisition/creation	Priority social media function performed by the resource
Advertising	MTC AdTech (MTS AdTech)	A subholding of the MTS Group responsible for the development of advertising technologies.	2024, created as a result of internal restructuring based on the assets of MTS Stream	Advertising and reference
Gaming	MTC Remote Play (MTS Remote Play)	MTS Remote Play is a remote gaming service (free, trial version)	2022, own development	Entertainment
	MTC Fog Play (MTS Fog Play)	Cloud gaming service	2022, own development	Entertainment
	MTC Verse (MTS Verse)	A virtual space for gamified interaction with the ecosystem and between users	2024, own development	Communicative
Innovative AI-powered media communication resources	MWS GPT	An aggregator of large language models of cloud services	2025, own development	Communicative
	Cotype	Large Language Model (LLM) for Business	2024 (as MTS AI Chat), own development	Communicative
	Kodify	Code generation and autocompletion service for streamlining the development process	2024, own development (based on Cotype)	Communicative

Source: compiled by the authors based on open sources, as well as official reports and press releases of PJSC MTS and its subsidiaries¹⁷.

¹⁷ MTS news in Russia and around the world. MTS Group. URL: <https://moskva.mts.ru/about/media-centr/soobshheniya-kompanii/novosti-mts-v-rossii-i-mire>; Financial statements. MTS Group. URL: <https://moskva.mts.ru/about/media-centr/soobshheniya-kompanii/finansovaya-otchetnost>

The MTS ecosystem is characterized by a high degree of diversification of its media communications resources, offering audiences virtually every existing type of media activity, not only typical online media (streaming audio and video, gaming) but also offline media – printed books, concerts, and festivals. This is a direct result of the company’s development strategy for creating a digital user experience. Along the way, the ecosystem encountered setbacks, such as the short video service Nuum (closed in 2025). Launched by MTS in 2019, it initially envisioned a platform for video game streaming and an alternative to the US-based Twitch, part of the Amazon ecosystem. Despite a rebranding (2023), it failed to achieve economic efficiency, and the service was closed a year and a half later. Unlike other MTS media communications assets, in the case of Nuum, the ecosystem failed to take advantage of the network effect: due to a failed financial model, the number of user-generated content creators was insufficient to attract a sustainable audience¹⁸.

Mediacommunication resources of the T-technologies digital ecosystem

The T-Technologies ecosystem was formed on the basis of one of the leaders in the digital banking sector, Tinkoff Bank, whose parent structure was acquired by Interros in 2022 and renamed T-Technologies in 2024. By 2025, the majority of revenue was generated by the provision of financial services, primarily to individuals and small businesses.

The history of the ecosystem’s formation began in 2018, when the bank presented its Lifestyle Banking strategy to investors, which was based on the creation of a customer-centric ecosystem of banking products¹⁹. For a long time, the company’s only media asset was the online magazine “T-Journal” (T-J), created in 2014 as a corporate publication that combined the functions of information and analytical expertise in the financial sector and a channel for promoting the bank’s own products. Since 2018, the magazine has positioned itself as a full-fledged financial media outlet. In 2019, the banking ecosystem launched the social network “Pulse”. Initially developed as a platform for exchanging experiences and ideas for investors, it today serves as a social network for the bank’s clients and includes live streaming broadcasts from experts, an online resource platform for mastering investment skills, an online competition and project platform, news channels, and the “Aptechka” app.

¹⁸ MTS to shut down its YouTube and TikTok analog: Why the operator failed to develop its own video hosting service. URL: https://www.rbc.ru/technology_and_media/20/03/2025/67daa7c39a79472d3feee484

¹⁹ Tinkoff strategy day presentation. June 7, 2018. URL: <https://cdn.tbank.ru/static/documents/ba3d15a4-63d1-4ce1-b246-f138dc24a023.pdf>

In 2023, the “T-Gorod” app was launched, with an average monthly audience (MAU) of over 10 million people. Its unique feature is that all banking services (secure payments, cashback management, communication with the bank’s support service) are combined with lifestyle services (planning travel, leisure, shopping).

T-Technologies ecosystem does not have its own audiovisual streaming services. The media content of the T Pro subscription ecosystem comes from access to partner services. As of 2025, the T-Technologies ecosystem, through partnership agreements, includes online cinemas Wink, START, PREMIER, Ivi, and KION, the music streaming service VK Music, and the MyBook e-library. -

T-Technologies places particular emphasis on developing AI-based technologies in the areas of finance and investment, information security, and secure financial management. The company’s first AI product, Oleg, a smart voice assistant (later renamed “Secretary”), was released in 2017. In 2025, the T-one automatic speech recognition model was made publicly available.

The media communications resources included in T-Technologies include socio-political news, social media, search engines, AI-powered media communications, and interactive communications (see *Table 4*), access to which is primarily by subscription.

Table 4

**Media communications resources of the T-technologies ecosystem
(as of 2025)**

Resource type	Name	Description	Year of acquisition/creation	Priority social media function performed by the resource
News socio-political	Т-Ж (“Т-Ж”, former «Tinkoff Journal»)	An online magazine about money and life	2014, own development	Informational
Social media	«Пульс» (“Pulse”)	A specialized social network for investors	2019, own development	Communicative
	«Т-Банк Отзывы» (“T-Bank Otzyvy”, Russian for “T-Bank Reviews”)	A service where real customer reviews of products and services from various companies are published	2023, own development	Communicative
	Аптечка (“Artechka”, Russian for “First aid kit”)	The medicine-checking service of the “Pulse” social network	2024, own development	Informational

Resource type	Name	Description	Year of acquisition/creation	Priority social media function performed by the resource
Service and search	Город (“Gorod”, Russian for “City”)	A super app that brings together products, banking and non-banking services, and ecosystem services.	2023, own development	Communicative
	Афиша (“Afisha”, Russian for “Poster”)	A cashback ticketing service, part of the “Gorod” (“City”) super app	2019, own development	Informational
	Путешествия (“Puteshestviya”, Russian for “Trips” or “Travels”)	A travel planning service, part of the “Gorod” (“City”) super app	2019, own development	Informational
	Т-игры (“T-Igry”, Russian for “T-Games”)	A service for purchasing keys for online games, game streams, and lotteries, part of the “Gorod” (“City”) super app	2022, own development	Entertainment
AI-based media communication resources	Вселенная AI-ассистентов (“Vselennaya AI-assistentov”, Russian for “AI assistants universe”)	A group of personalized smart voice assistants: Secretary, Invest, Finance, Shopping, Junior.	2024, own development	Communicative
Interactive communication	Фабрика роботов (“Fabrika robotov”, Russian for “Robot factory”)	Anti-fraud service based on speech recognition and chatbots	2024, own development	Communicative
	VoiceKit	Speech technology for converting voice to text and voice to text	2010, own development	Communicative
	T-one	Open streaming model for voice recognition	2025, own development	Communicative
	Unidraw	Interactive online whiteboard	2022, own development	Communicative

Source: compiled by the authors based on open sources, as well as official reports and press releases of PJSC T-Technologies and its subsidiaries²⁰.

²⁰ T-technologies. Press releases. URL: <https://t-technologies.ru/press-releases/>; T-technologies. Reports. URL: <https://t-technologies.ru/results/>

The T-Technologies ecosystem has a limited number of media communications resources, but they are all integrated with other ecosystem products, primarily financial ones, and are aimed at implementing the “lifestyle bank” strategy. The direct contribution of these resources to revenue generation is either nonexistent or insignificant. These resources connect T-Technologies’ financial and banking services, address the challenges of stimulating demand for these services, and generally contribute to the growth of the ecosystem’s user network, shaping new practices for using banking products in everyday life. T-Technologies represents an interesting example of building cross-partnerships with other ecosystems.

Discussion and conclusion

In the context of three research discourses examining the phenomenon of digital ecosystems, the conducted analysis demonstrates that Sber, MTS, and T-Technologies are in the process of integrating into media communications at the social and industrial levels. A historical and genetic reconstruction of these ecosystems revealed a common characteristic: the acquisition or creation of their own media communications assets is associated with the transformation of their business model into an ecosystem-based one. However, in all other respects, the role and place of media communications assets in the studied ecosystems differs, with the key factor in this difference being the genesis of the ecosystems. A number of other factors also play a significant role (see *Table 5*).

Table 5

Factors of difference in models of media assets of non-media DES

Typological characteristics	Sber	MTS	T-Technologies
Ecosystem genesis	Financial	Telecommunication	Financial
Dominant types of media assets	News, socio-political, service and search, streaming audiovisual, AI-based innovative	Streaming audiovisual, online libraries, original content production, gaming advertising, AI- based innovative	News, socio-political, social networks, service and search, AI-based innovative, interactive communications

Typological characteristics	Sber	MTS	T-Technologies
Dynamics of formation of media assets	Constantly increasing due largely to external acquisitions with the transfer of assets into separate business structures	The increase is largely due to original products. Elements of instability due to the revealed ineffectiveness of several products	The increase is largely due to original products
The main functional purpose of media assets	Maintaining core business	Core business	Maintaining core business
Depth of integration of IT assets into the ecosystem	Relatively low	High	Relatively low
Share of media assets in total revenue	Low (around 2% in 2024) ²¹	High (around 50% in 2024) ²²	Moderate (less than 19% in 2024) ²³

Source: compiled by authors based on open sources, as well as official reports and press releases of Sberbank PJSC, MTS PJSC, T-Technologies PJSC and subsidiaries.

Table 5 identifies two ecosystems with a financial-genetic model (Sber, T-Technologies) and one with a telecommunications-genetic model (MTS). Comparing them, a clear distinction can be made between their development models. The “financial” ecosystems are similar to each other and differ from the telecommunications ecosystem in the depth of integration/autonomy of their media communications assets, their contribution to revenue, and the degree of associated institutional and economic risks for the parent company. The integration of media communications assets into the MTS ecosystem is deeper

²¹ Summarized consolidated financial statements. Public Joint-Stock Company Sberbank of Russia and its subsidiaries for 2024 with independent auditor’s report. URL: https://www.sberbank.com/common/img/uploaded/files/info/reporting_4q_pnz4bfhv_2024.pdf

²² MTS PJSC annual report for 2024. Strategy. URL: <https://ar2024.mts.ru/ekosistema-mts-vektory-i-rezultaty-razvitiya/nasha-strategiya/>

²³ T-Technologies’ 2024 IFRS results. URL: <https://cdn.tbank.ru/static/documents/20f7781f-c008-4a1a-b2c4-207799fdabf5.pdf>

than in the case of ecosystems with a “financial” genesis. They are an integral part of the MTS ecosystem both structurally and strategically, possessing a low degree of autonomy and subordinate to a single ecosystem strategy. At the same time, “financial” ecosystems operate their media communications assets primarily through a partnership model. This helps them minimize geopolitical and economic risks, while the failure of individual MTS media communications assets impacts the entire ecosystem.

In ecosystems of “financial” genesis (Sber, T-Technologies), media assets are used to “support” core operations (by attracting new customers and retaining existing ones, and by engaging investors in media consumption on ecosystem platforms). Their experience demonstrates that media resources can be important to the ecosystem both as standalone products, as tools for building network effects around core products to support priority business areas, and as a means of engaging users in new forms of communication. Although media resources are strategically important for these ecosystems in terms of access to audience data and analyzing their preferences and needs to create personalized products and services, they contribute virtually nothing to the core revenue structure.

The example of MTS is noteworthy in that it demonstrates the trend of transforming the media industry into a mediacommunication industry. By developing non-core media businesses, the telecommunication company is becoming a full-fledged player in the media communications industry as it transforms into an ecosystem. MTS’s media resources, responsible for distribution (streaming audiovisual services) and original content production, drive growth and customer retention, gaming services expand its audience, and innovative AI-powered media communications resources ensure internal integration and automation of ecosystem processes, as well as act as standalone services offered to individual and corporate clients.

Advertising divisions also play a key role, performing multiple functions within the ecosystem. They generate additional company revenue by monetizing the ecosystem’s user data by offering advertisers highly targeted and multi-channel advertising products. They also enhance the ecosystem’s media assets by integrating advertising technologies, and they promote customer retention and encourage the transition to multi-product consumption for both business clients and end users.

The second indicator that ecosystems have become important players in the media communications industry thanks to their media assets is the production of their own content and its distribution on their own and partner platforms.

MTS is the leader here, confirming the notion that ecosystems compete with traditional media for audience attention. Its key media assets, KION and MTS Music, are among the top five in terms of audience reach among Russian online cinemas and audio streaming services, respectively²⁴. According to MTS's own estimates, the number of KION users exceeded 10 million in 2025. Meanwhile, according to ROMIR estimates, MTS Music's audience rating in 2025 was approximately 10%. MTS's example confirms the notion that ecosystems compete with traditional media for audience attention.

From a sociological perspective, it should be noted that all three analyzed ecosystems strive to become part of the daily lives of their users, "linking" their products to various aspects of their lives and offering new social practices. The media communication resources of these ecosystems perform social functions that, according to Prokhorov, are characteristic even of "classical" journalism (Prokhorov, 2011). Although all the ecosystems studied perform information, communication, and entertainment functions, the set of functions performed by the combined assets of the various ecosystems differs. Despite their diversity, the ecosystems' arsenal of media communication resources is limited: thanks to audio and video streaming services, online cinemas, and online libraries, the media functions they perform primarily support entertainment/recreational media consumption practices and, thanks to elements of social media, communication functions.

None of the three companies analyzed above systematically pursues the socially oriented function of media or shapes a coherent sociopolitical agenda, even though they possess fully-fledged media and information media. Meanwhile, for traditional media outlets that perform a socially oriented function, digital ecosystems themselves serve as the infrastructure for distributing their content: online cinemas offer the opportunity to watch all federal and a number of specialized television channels live, audio streaming services allow for listening to live radio broadcasts, and online library services provide online access to some newspapers and magazines.

The Sber, MTS, and T-Technologies ecosystems discussed above are still limited in their impact on the traditional media system due to their limited influence on the production of professional socio-political content. However, with their influential audio and video streaming services, they are contributing to the transformation of media consumption from linear to nonlinear, on-demand, and primarily satisfying audiences' desire for recreation. Each of these

²⁴ MTS PJSC annual report for 2024. MTS Group in 2024. URL: <https://ar2024.mts.ru/ekosistema-mts-vektory-i-rezultaty-razvitiya/gruppa-mts-v-2024-godu/>

ecosystems has a different genesis, is at different stages of evolution, and there is no reason to believe they will occupy the same place in the media system. However, it is clear that media resources are becoming a significant element of the system's development strategy for these DESs.

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ARTICLES

The influence of social media news overload on news avoidance and filtering in Generation Z: A PLS-SEM study

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Abstract

This study examines the influence of social media news overload on the news consumption behaviors of Generation Z users in Vietnam, emphasizing the roles of news efficacy, affective load, and social filtering. Users have to deal with too much information on social media, which can make them tired and want to stay away from the news. By integrating Cognitive Load Theory and Social Cognitive Theory, this research explores how news overload influences news avoidance and filtering behaviors. The study proposes that increased news overload exacerbates news avoidance through heightened affective load and diminished news efficacy. Furthermore, it examines how the perception that “news finds me” moderates this relationship. The study utilizes a stratified random sampling technique, surveying 1,224 participants, and employs Partial Least Squares Structural Equation Modeling (PLS-SEM) for data analysis. The results confirm that news overload significantly leads to news avoidance and social filtering, with news efficacy playing a crucial mediating role. The results show how important it is to come up with ways to control how much news people read and to help them process information better. This means that social media platforms should provide personalized content to mitigate the negative effects of overload, such as filtering out irrelevant news and highlighting important updates based on user preferences. The study enhances comprehension of news

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avoidance behaviors in the digital era and offers insights into how social media users can navigate information overload.

Keywords

News overload, news avoidance, news efficacy, news filtering, Generation Z.

Introduction

The way younger people acquire their news has changed a lot in the last few years, mostly because of the rise of social media. These platforms have become the main places to obtain news about politics, current events, and global issues. They are often more popular and reach more people than traditional media (Song et al., 2020; Sun et al., 2021). Many users perceive news on social media as more authentic and accessible, leading to a growing dependence on these platforms for regular updates. However, there is a downside to the abundance and speed of news: users are increasingly exposed to an overwhelming volume of information, requiring time, cognitive effort, and discernment to process effectively (Tian, 2022).

Recent Russian media scholarship provides a unique structural analysis of information overload, framing it not solely as an individual cognitive constraint but as a systemic consequence of the transformation in digital media. Scholars highlight how digitalization, fragmentation, virtualization, and the growing socio-cultural centrality of media communication intensify information flows and produce persistent informational saturation (Baychik, 2023). Research on Russian “digital youth” further shows that social media function as primary news environments, generating fragmented and personalized agendas shaped by algorithmic curation (Dunas et al., 2023). Scholars also connect these processes to new epistemic inequalities, pointing out that not all users have the same skills when it comes to finding, understanding, and using information in complicated digital environments (Vartanova, & Gladkova, 2022). However, existing Russian scholarship has primarily focused on structural transformations of media space and audience socialization, while the psychological mechanisms linking social media news overload to users’ coping behaviors, such as anxiety, information avoidance, or selective exposure, remain insufficiently examined.

The constant flow of new content, especially breaking news alerts and recommendations based on algorithms, can lead to news overload, which can make people exhausted, anxious, and less motivated to read the news (Song et al., 2017; Koselioren, & Cakir 2024). Users often use coping strategies like selective engagement, filtering out content that is not relevant, or not reading

news at all (Ku et al., 2019; Tandon et al., 2022) when they have a lot of information to sort through and process. This behavior of avoiding something can be unintentional, like when users passively choose different content, or it can be intentional, like when they are stressed, frustrated, or emotionally drained (Karlsen et al., 2020a; Skovsgaard, & Andersen 2020).

A major factor influencing these behaviors is news efficacy, which is how sure a person is that they can navigate their way around the digital news world. Users can better evaluate and manage news content when news efficacy is higher, which lessens the negative effects of too much information. On the other hand, low news efficacy makes people avoid news more and makes it harder for them to engage with it (Islam et al., 2022).

Another common way to address information overload is social filtering, in which users depend on their social networks, especially friends and peers, to identify and prioritize news that is important to them. Such approaches can help with information overload, but it can also lead to echo chambers and biased information (Park, & Kaye 2018; Goyanes et al., 2021). Recommendation algorithms and automated filtering systems, intended to aid users, may inadvertently perpetuate information silos and intensify psychological distress if not managed with transparency and ethical considerations (Thurman, 2019; Tian, 2022), particularly by limiting exposure to diverse viewpoints and reinforcing existing biases in the information users receive.

An additional factor of interest is the “news finds me” (NFM) perception, where users believe that important news will naturally reach them through social feeds without active seeking (Gil De Zúñiga et al., 2017). While this perception is associated with increased news exposure, it may also reduce critical engagement and lead to greater intentional avoidance when users feel overwhelmed by unsolicited content (Song et al., 2020). Despite its growing relevance, the moderating role of the NFM perception and the mediating role of affective responses in the relationship between overload and avoidance remain underexplored.

To address these gaps, this study integrates Cognitive Load Theory (Sweller, 2011) and Social Cognitive Theory (Bandura, 1986; Lu, 2020) to examine how social media news overload influences news avoidance and filtering behaviors. Specifically, it investigates the mediating effects of news efficacy and affective load, along with the moderating role of the NFM perception. In the context of Generation Z users in Vietnam – a digitally native cohort increasingly exposed to information excess – this research aims to provide insights into their coping strategies and inform future interventions in digital news literacy. This study

seeks to answer the following research question: how does social media news overload influence news avoidance and filtering behaviors among Generation Z users in Vietnam?

Literature review and hypotheses

News overload

News overload refers to the perception of receiving more news than one can cognitively process, leading to emotional fatigue and disengagement (Sweller, 2011; Holton, & Chyi 2012). Based on Cognitive Load Theory, individuals have limited processing capacity; when overwhelmed, they may experience confusion, stress, and impaired decision-making (Bawden, & Robinson, 2009; Savolainen et al., 2018; Plass, & Kalyuga, 2019). Social media exacerbates this issue by continuously delivering algorithmically selected and user-generated content. This social media news overload has been associated with higher levels of stress and avoidance behaviors (Islam et al., 2018; Wang et al., 2022). Empirical studies show that social media users perceive significantly more news overload compared to users of traditional media (Holton, & Chyi, 2012; Song et al., 2017). Thus, the following hypothesis is proposed:

H1. Perceived news overload on social media has a positive effect on social media news avoidance.

News avoidance

News avoidance is the behavioral tendency to intentionally or passively disengage from news content (Skovsgaard, & Andersen, 2020). This response is often rooted in emotional or cognitive overload, where individuals choose to reduce exposure to preserve their well-being (Karlsen et al., 2020b). Avoidance may manifest in several forms: skipping news updates, limiting news app use, or entirely withdrawing from news engagement. A report on digital news by Tunney et al. (2021) showed that 57% of the worldwide population “often” avoids social media news subjected to social media news overload. As the frequency of news exposure increases, people gradually perceive news overload, which can lead them to shut down cognitively and deny the necessity of news consumption (Aldoory, & Van Dyke, 2006) or to put less effort into acquiring news (Nordenson, 2008). People have a tendency to shelter themselves from the bombardment of information (Savolainen, 2007).

Affective load

It has long been recognized that persons receiving an “infoglut” (Shenk, 1997) or excessive information beyond their processing capacity suffer from responses variously labeled with terms such as information fatigue (Ni et al.,

2023), “individual psychological discomfort” (Eppler, & Mengis, 2004) or, the term adopted in this study, “affective load”. The phrase is commonly attributed to Nahl (2004), who described how the time pressure and uncertainty of excessive information could lead to irritation, frustration, anxiety, or even rage, reactions that prompt strategies to reduce the flow of information. According to Ni et al. (2023) news overload and affective load affected users’ news avoidance behavior. Research supports the mediating role of affective load between overload and avoidance (Blekesaune et al., 2012). However, research on the subject has tended to focus on more traditional news sources such as television news, news magazines, and news websites (Ksiazek et al., 2010; Edgerly, 2015), with the response of media users to news overload from social media sources less studied (Neubaum, & Krämer, 2017). This allows us to propose the following hypothesis:

H2. Affective load is a positive mediator in the relationship between news overload and news avoidance on social media.

Social filtering

Apart from social media news avoidance, individuals use other techniques, such as social media news filtering, when confronted with news overload on social media (Park, 2019; Van Erkel, & Van Aelst, 2021). Social media users are more frequently exposed to either an algorithm of news than users of traditional news media (Guan et al., 2022) or processing the news by using social filtering (Lee et al., 2019). Social media allow users to easily track their friends’ activities: what new stories they submit, comment on, or read. To seek the most useful and relevant information and to filter out less important or irrelevant information, users can change social media settings, subscribe to a certain media channel, follow certain news experts, and block uninterested news feeds, thereby potentially reducing their feeling of news overload (Savolainen, 2007). According to Chen and Masullo Chen (2020), social media users can get credible news from abundant information by putting in less effort through the use of social filtering that provides selected and customized news according to the set filters. Filtering news on the basis of social media offers a new paradigm for obtaining and interacting with news – what this study conceptualizes as social filtering. Social filtering is one of the most important usages of social media. Thus, the following hypothesis is proposed:

H3. Perceived news overload on social media has a positive effect on social media social filtering.

“News finds me” perception

“News finds me” perception (NFM) is defined as the belief that people are well-informed without actively seeking out and following the news, because

people can access news information indirectly through “general Internet use, peers, and connections in social networks” (Song et al., 2020). The ubiquity and pervasiveness of news in our ambient environment make it difficult to avoid being exposed to it. This can lead some people with news overload perception to believe that they do not need to regularly follow the news to stay informed because the news will seemingly follow them wherever they go. A study finds that NFM perception is associated with lower levels of traditional news media use and higher news exposure through social media (Gil De Zúñiga et al., 2017). From the perspective of behavioral results, people with high levels of NFM may have an unpleasant experience with news and gradually transform their presence into negative actions. NFM perception induced people’s news avoidance. Even after “stumbling upon” a piece of news, individuals who have a high need for media (NFM) may display news avoidance behaviors, such as shifting their gaze away from a news post and towards a different post on the page or scrolling down in search of a non-news-related post (Goyanes et al. 2021). In this context, we propose the following hypothesis:

H4. “News finds me” perception positively moderates the relationship between news overload and news avoidance on social media.

News efficacy

According to Social Cognitive Theory, self-efficacy reflects an individual’s belief in their ability to perform tasks and influence outcomes (Bandura, 1986). In the context of media use, news efficacy refers to one’s confidence in accessing, understanding, and evaluating news content. Higher news efficacy motivates users to engage with news actively and manage information overload more effectively (Bronstein, 2014; Park, 2019).

However, when users are bombarded with excessive or complex news – particularly on social media – their confidence may decline, leading to disengagement (Park, 2019). Perceived news overload undermines users’ belief that they can process news effectively, increasing the risk of avoidance. Thus, the following hypothesis is proposed:

H5. Perceived news overload on social media is negatively associated with social media news efficacy.

News efficacy also plays a key role in shaping users’ news-seeking behavior. Individuals with high efficacy are more likely to filter and evaluate news confidently, while those with low efficacy may avoid news altogether due to perceived cognitive burden (Case et al., 2005; Knobloch-Westerwick et al., 2005). This suggests a mediating role of efficacy between overload and avoidance:

H6. Social media news efficacy negatively affects news avoidance.

H7. News efficacy mediates the relationship between perceived news overload and news avoidance.

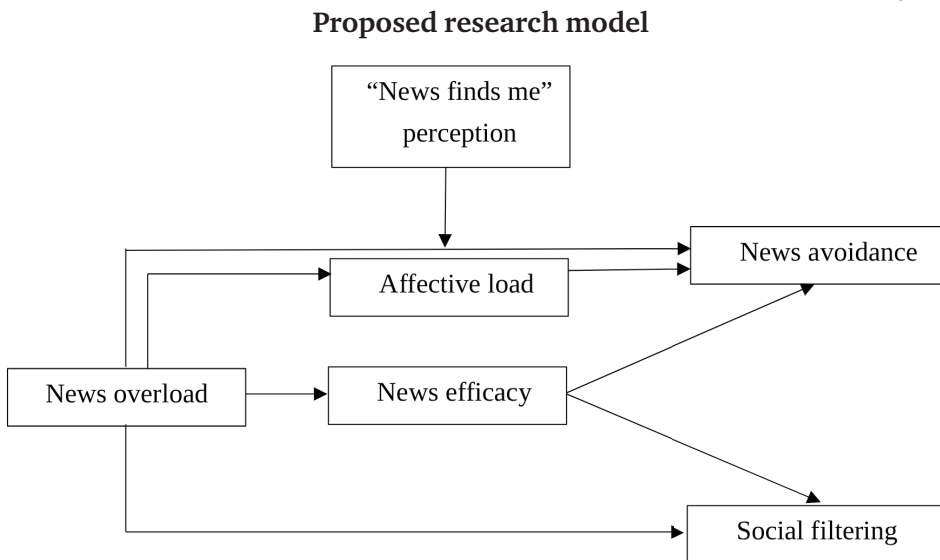
Furthermore, diminished news efficacy may lead users to depend on social filtering – relying on peers or algorithms to curate news. This behavior aligns with the “news finds me” perception, where users believe relevant news will reach them passively (Gil De Zúñiga et al., 2017). Research suggests that overwhelmed users often adopt heuristic strategies, such as deferring to social cues (likes, shares, influencers), especially when they feel uncertain about news credibility (Sundar, 2008; Metzger et al., 2010). As a result, lower news efficacy can increase reliance on social filtering instead of independent news engagement. This leads to two additional hypotheses:

H8. Social media news efficacy negatively affects social filtering on social media.

H9. News efficacy mediates the relationship between perceived news overload and social filtering.

We developed a research model as shown in *Figure 1*, based on our hypotheses. All of the hypothesized relationships, including direct, moderating, and mediating effects, are shown by solid lines. This unified visual style makes the model easier to understand and makes the proposed structural relationships easier to read.

Figure 1



Methodology

The study used a stratified random sampling method based on geographical and socio-economic stratification to ensure that the sample was representative of a wide range of people. The General Statistics Office of Vietnam's 2019 Population and Housing Census defined six socio-economic regions in Vietnam. Because of the study's size and logistical issues, one representative city from each region was chosen to be a sampling unit (General Statistics Office of Vietnam, 2019).

The research team set up a network of trained collaborators, with two at each site, for a total of 12 across the six chosen locations. This made it easier to locate participants. Each collaborator received training in how to conduct surveys and ensure that the data was accurate. They were then in charge of getting people from local high schools and colleges to respond. Recruitment at each location was finalized upon reaching the specified sample size.

The Yamane formula was used to figure out the sample size needed, with a 95% confidence level and a 5% margin of error (Yamane, 1969). Because there were more than 100,000 Generation Z people at each site, we needed at least 204 valid responses from each site. This gave us a total sample size of 1,224 people. This method made sure that the study's goals were met with both statistical rigor and demographic representativeness. The people who took part were between the ages of 15 and 21 ($M = 18.42$, $SD = 2.07$). 42.2% of them were male, and 57.8% were female. 41.3% of them were 15 to 17 years old, and 58.7% were 18 to 21 years old.

This study was conducted in accordance with ethical standards for research involving human participants. All participants were clearly informed about the purpose of the study, assured of their voluntary participation, and informed of their right to withdraw at any time if they wished. For participants under the age of 18, written informed consent was obtained from their parents or legal guardians prior to data collection. All responses were collected anonymously and treated with strict confidentiality. The survey content was reviewed and approved by the Ethics Committee of Thai Nguyen University of Sciences. For more information about sample characteristics, see *Table 1*.

Table 1

Sample analysis		
Demographics	Frequency	Percentage
Gender		
Male	516	42.2%
Female	708	57.8%
Age		
15-17	506	41.3%
18-21	718	58.7%
Level of education		
High school students	506	41.3%
University students	718	58.7%

N = 1224

The measurement instrument consisted of six reflective constructs: News Overload (NO), News Avoidance (NA), News Efficacy (NE), Social Filtering (SF), Affective Load (AL), and “news finds me” perception (NFM). A total of 23 items were used, each rated on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

News overload (NO) was measured by three items adapted from Park (2019), reflecting participants’ perceptions of being overwhelmed by the quantity and frequency of news on social media (e.g., “I receive more news than I can process on social media”).

News avoidance (NA) was measured using five items adapted from Park (2019) and Pentina and Tarafdar (2014). These items assessed behavioral tendencies to reduce or avoid news engagement due to overload or fatigue (e.g., “I take deliberate measures to avoid reading news information when it becomes overwhelming”).

News efficacy (NE) was measured with three items adapted from Bronstein (2014) and Park (2019), reflecting users’ confidence in identifying, evaluating, and understanding news content (e.g., “I can find the news I want from social media”).

Social filtering (SF) consisted of two items adapted from Park (2019), measuring reliance on social cues and peers to filter news content (e.g., “I prefer to read the news recommended by my friends on social media”).

Affective load (AL) was measured by four items adapted from Nahl (2004), reflecting emotional and psychological strain caused by excessive news exposure (e.g., “Reading too much news will make me feel weak or tired”).

“News finds me” perception was assessed through six items adapted from Song, Gil De Zúñiga, and Boomgaarden (2020), capturing the belief that users do not need to actively seek news because it will reach them passively (e.g., “I do not worry about keeping up with the news because I know news will find me”).

PLS-SEM was selected for this study due to its appropriateness for exploratory research and its ability to handle complex models involving multiple latent constructs (Hair et al., 2021). The multivariate modeling technique was implemented using the specialized software SmartPLS (version 3.3.3), with variance-based estimation serving as the core methodological approach (Hair et al., 2019). A two-part assessment process is implied by the PLS-SEM methodology, with the first phase focusing on the measurement model and the second on the structural model (Hair et al., 2019). The model validation in the first phase is managed by taking into account the dependability and validity of the components and the manifest variables that are allocated to them (ibid). This approach entails calculating the heterotrait-monotrait ratio (HTMT), average variance extracted (AVE), composite reliability (CR), outer loadings, and Cronbach’s alpha (α) (ibid). In reflective models, the outer loadings are employed to examine the relationships between constructs and indicators. CA and CR are the metrics for inner consistency reliability (ibid). Since HTMT (Henseler et al., 2015) conducts a statistical discriminant validity check, AVE quantifies the convergent efficiency of the factor degree (Henseler et al., 2015). The values of all predictor constructs are shown by the inner VIF values, which point to a complementary test known as collinearity evaluation. The structural model validation, or second phase, determines the level of significance of the correlations between constructs by evaluating the presented hypotheses. The structural model’s path coefficients, p-values, and t-values are calculated at this level. Multi-group analyses are used to validate each control variable, first at the global level and then among data subsets. The level of fit of the model is determined by the standardized root mean square residual (SRMR) measurement (Henseler et al., 2015). However, if there are no credible outputs for the assessment of the inner model’s predictive potential, then all indicators and actions taken up to this point from both stages are meaningless (Hair et al., 2019). The final endogenous variable’s R^2 and f^2 values are calculated for this purpose using the PLS predict algorithm.

Findings and hypothesis testing

The measurement model assessment

The values of the measures of outer loading, CR, and AVE that characterize the convergent validity and inner consistency test for the reflective variables are shown

in *Table 2 and Table 3*. Some variables, AL2, NA1, NA5, and NFM1, were removed due to factor loadings below 0.7. We see that the outer loadings are higher than the 0.7-percent minimal limit (Hair et al., 2019). In turn, this validates the indicator's reliability. Every composite reliability value and the value are significantly higher than the reference value of 0.7 (ibid). This evidence demonstrates the internal consistency of all constructs. All AVE values are higher than the threshold of 0.5 (Henseler et al., 2014), confirming the model's convergent validity. The interval [0.061, 0.623] encompasses all HTMT values that demonstrate discriminant validity, satisfying the conservative requirement that they must be less than 0.85 (Henseler et al., 2015). This conclusion is reflected in *Table 4*, which supports the claim that each construct is unique from the others in accordance with the criteria of empirical research (Hair et al., 2019).

Table 2

Factor loadings of constructs							
	AL	NA	NE	SF	NFM	NFM*NO	NO
AL1	0.839						
AL3	0.852						
AL4	0.800						
NA2		0.875					
NA3		0.867					
NA4		0.854					
NE1			0.914				
NE2			0.925				
NE3			0.908				
SF1				0.908			
SF2				0.880			
NFM2					0.736		
NFM3					0.790		
NFM4					0.847		
NFM5					0.839		
NFM6					0.838		
NFM*NO						1.434	
NO1							0.886
NO2							0.892
NO3							0.895

Table 3

Construct reliability and validity

	Cronbach's Alpha	rho_A	Composite reliability	Average Variance Extracted (AVE)
AL	0.775	0.779	0.870	0.690
NA	0.833	0.834	0.900	0.749
NE	0.904	0.905	0.940	0.839
SF	0.751	0.759	0.889	0.800
NFM	0.869	0.873	0.906	0.658
NFM*NO	1.000	1.000	1.000	1.000
NO	0.870	0.870	0.920	0.794

Table 4

**Discriminant validity evaluation for the reflective variables
by HTMT criterion**

	AL	NA	NE	SF	NFM	NFM*NO	NO
AL							
NA	0.623						
NE	0.146	0.387					
SF	0.339	0.413	0.312				
NFM	0.600	0.581	0.167	0.456			
NFM*NO	0.189	0.230	0.061	0.228	0.080		
NO	0.617	0.701	0.300	0.351	0.584	0.083	

The structural model assessment

The VIF scores for all construct combinations are displayed in *Table 5*. The highest value, which falls under the conservative upper limit of 3 (Becker et al., 2015), is 1.947. Therefore, no issues with predictor construct collinearity were found. With an SRMR value = 0.078 < 0.08, the research model fits the data.

To assess the suitability of the SEM model, the R² coefficient serves as a key criterion. 0.10 as the lowest acceptable R² value for the model (Falk, & Miller, 1992). The adjusted R² values were 0.482 for News Avoidance (NA), 0.257 for Affective Load (AL), 0.070 for News Efficacy (NE), and 0.115 for Social Filtering (SF), suggesting that the predictors explained a significant portion of the variance (*Table 6*). The f² effect size is used to test the effect sizes of the outcome variables (*Table 7*). 0.35, 0.15, and 0.02 are acknowledged as having

large, medium, and moderate effects, respectively (Hair et al., 2019). Cohen (2013) went on to say that values less than 0.02 have no impact. Table 7 displays the effect size of pathways ranging from no effect to a considerable influence based on these characteristics.

Table 5

**Collinearity evaluation between the predictor constructs
by inner VIF values**

	AL	NA	NE	SF
AL		1.526		
NE		1.079		1.076
NFM		1.495		
NFM*NO		1.030		
NO	1.000	1.607	1.000	1.076

Table 6

R² and R² adjusted

	R Square	R Square Adjusted
AL	0.258	0.257
NA	0.484	0.482
NE	0.071	0.070
SF	0.117	0.115

Table 7

The result of effect size (f²)

	AL	NA	NE	SF
AL		0.045		
NE		0.062		0.040
NFM		0.047		
NFM*NO		0.030		
NO	0.348	0.144	0.076	0.057

Testing of research hypotheses

To test our hypotheses and make sure the estimates were stable, we used a bootstrapping method with 5000 subsamples (Yuan, 2012). We looked

at t-values (> 1.96) and p-values (< 0.05) to see if the relationships were statistically significant (Falk and Miller 1992). This method guarantees the reliable inference of the model's direct and indirect effects.

News overload (NO) harmed news efficacy (NE) ($\beta = -0.266$, $p < 0.001$), which means that too much news makes people less sure they can understand it.

News efficacy (NE) had a negative effect on news avoidance (NA) ($\beta = -0.186$, $p < 0.001$) and social filtering (SF) ($\beta = -0.196$, $p < 0.001$). This supports the idea that when news efficacy goes down, people are more likely to avoid news and filter it out.

News Overload (NO) \rightarrow News Efficacy (NE) \rightarrow Social Filtering (SF) ($\beta = 0.052$, $p < 0.001$), indicating that news efficacy mediates the relationship between news overload and social filtering.

News Overload (NO) \rightarrow News Efficacy (NE) \rightarrow News Avoidance (NA) ($\beta = 0.050$, $p < 0.001$), which shows that when news efficacy goes down, people are less likely to avoid news when they are overloaded with it.

These results confirm that news efficacy is a crucial factor. People who are overloaded with news are less confident in their ability to process it, which makes them rely more on social filtering and avoid news more, ultimately leading to a decrease in their overall engagement with news content.

The results of the analysis are the basis for the next step, which is to test the research hypotheses (see *Table 8*).

Table 8

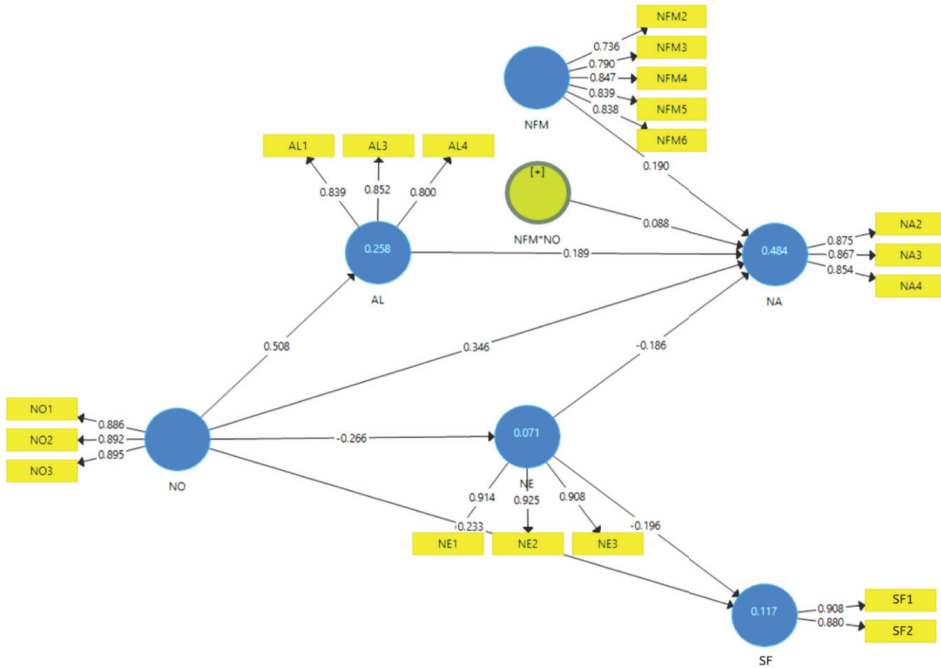
Research hypothesis testing						
Hypothesis	H	β	T-values	P-Values	Decision	
News overload -> News avoidance	H1	0.346	10.188	0.000	Supported	
Affective load * News overload -> News avoidance	H2	0.096	5.234	0.000	Supported	
News overload -> Social filtering	H3	0.233	6.099	0.000	Supported	
“News finds me” * News overload -> News avoidance	H4	0.088	5.584	0.000	Supported	
News overload -> News efficacy	H5	-0.266	8.613	0.000	Supported	
News efficacy -> News avoidance	H6	-0.186	8.447	0.000	Supported	
News efficacy * News overload -> News avoidance	H7	0.050	5.945	0.000	Supported	
News efficacy -> Social filtering	H8	-0.196	6.044	0.000	Supported	
News efficacy * News overload -> Social filtering	H9	0.052	5.093	0.000	Supported	

Discussion and conclusion

This study offers important information regarding the impact of excessive social media news consumption on Generation Z in Vietnam. The findings validate that perceived news overload strongly influences both news avoidance and social filtering, with affective load and news efficacy playing crucial mediating roles (see *Figure 2*).

Figure 2

Output of measurement model



This study corroborates prior research indicating that excessive exposure to social media news leads to cognitive fatigue and disengagement (Koselioren, & Cakir 2024). The findings indicate that excessive news consumption has a direct and significant impact on news avoidance ($\beta = 0.346$, $p < 0.001$), thereby corroborating hypothesis 1 (H1). This suggests that as users feel overwhelmed by the sheer volume of news content, they deliberately reduce their engagement with news, either by minimizing their exposure or by completely disregarding news content.

The findings also validate that news overload enhances social filtering ($\beta = 0.233$, $p < 0.001$), thereby corroborating hypothesis 3 (H3). This finding

supports previous research indicating that overwhelmed users rely on social cues, such as peer recommendations, to manage their news consumption (Park, 2019). Social filtering lets people pick what news they want to see and makes it easier for them to think. This phenomenon is becoming more common in digital news settings (Goyanes et al., 2021).

This study extends previous research by examining affective load and news efficacy as mediators in the relationship between news overload and news avoidance. The results corroborate hypothesis 2 (H2), indicating that affective load significantly mediates the relationship between news overload and news avoidance ($\beta = 0.096$, $p < 0.001$). The finding indicates that individuals undergoing increased emotional distress due to excessive news exposure—such as anxiety, frustration, or fatigue—are more inclined to withdraw from news consumption (Ni et al., 2023). This fits with Cognitive Load Theory (Sweller, 2011), which says that when people have too much cognitive and emotional stress, they can't process information as well.

Furthermore, the study confirms that news efficacy mediates the impact of news overload on both news avoidance (H7: $\beta = 0.050$, $p < 0.001$) and social filtering (H9: $\beta = 0.052$, $p < 0.001$). Users with low news efficacy – meaning they lack confidence in their ability to assess and interpret news – are more likely to avoid news entirely or depend on social filtering as a coping strategy (Park, 2019). This finding aligns with Social Cognitive Theory (Bandura, 1986), which suggests that self-efficacy plays a critical role in shaping information-seeking behaviors.

The research result provides new empirical evidence supporting the moderating role of the “news finds me” perception in the relationship between news overload and news avoidance (H4: $\beta = 0.088$, $p < 0.001$). This finding suggests that individuals who believe that news will naturally reach them without active searching are more likely to disengage from news when they feel overloaded. This behavior aligns with previous research, which identifies passive news consumption as a predictor of news avoidance (Gil De Zúñiga et al., 2017).

This study advances Cognitive Load Theory by illustrating that affective load is a significant factor in news avoidance, connecting information overload to emotional distress and disengagement. Furthermore, by integrating Social Cognitive Theory, the study elucidates the role of news efficacy as a principal mediator in digital news consumption, providing a more comprehensive understanding of social media-driven news engagement. Prior research has investigated news avoidance within conventional media frameworks (Ksiazek

et al., 2010; Edgerly, 2015); this research expands our knowledge about news avoidance mechanisms specific to social media. The results complement the literature on passive news consumption by demonstrating how the “news finds me” perception intensifies avoidance behaviors in information-dense environments. These findings align with perspectives in Russian media studies that consider information overload as a structural consequence of digital media evolution rather than merely an individual cognitive constraint. Russian studies highlight that digitalization, fragmented agendas, and varying digital competencies create persistent informational saturation and epistemic divides among media users. In this context, the present findings augment this structural perspective by demonstrating how systemic conditions are expressed as individual psychological mechanisms, specifically affective load and news efficacy, that affect coping behaviors in social media news environments.

Based on these results, practical implications should focus on user-centered strategies that provide Generation Z the skills they need to handle their digital news environments well. Even though this group knows a lot about technology, they can still feel mentally stressed and exhausted. To build long-lasting habits of reading the news, it is important to improve self-control, critical thinking, and awareness of what you are doing.

First, Generation Z users can set up their news routines so they do not get too much information while still staying informed about important issues. Some of these habits could include making time to read the news, avoiding content that is repetitive or overly dramatic, turning off notifications for things that are not relevant, and only following a few trusted sources.

Second, it is important to show people how to use technology to improve news. Taking classes that teach them how to verify the sources of information, spot false information, and understand how algorithmic filtering works can help young people feel more confident about how to navigate complicated news.

Third, social filtering can become a collaborative activity by encouraging people to work together to curate news. In schools, colleges, and online communities, Generation Z members can exchange verifiable information, have meaningful discussions, and develop confidence in shared knowledge.

Finally, encouraging people to use technology with more awareness can help them stay informed and take care of their mental health. For instance, individuals can gather information from many sources, take brief pauses from the news, and pause to reflect after reading emotionally intense tales.

This study demonstrates that to prevent too much information from spreading on social media, we must modify these platforms and assist individuals

in becoming more self-reliant, literate, and emotionally resilient. Generation Z can transition from being passive information consumers to active curators of their digital lives by mastering these abilities. Empowering young users to self-regulate, critically evaluate, and meaningfully engage with news represents a sustainable pathway to reducing cognitive fatigue and enhancing informed participation in the digital public sphere.

Limitations and future research

This study has several limitations that warrant consideration. Firstly, it focuses solely on Generation Z users in Vietnam, which may limit the generalizability of the findings to other demographic or cultural contexts. Although a stratified random sampling method was employed to enhance representativeness, the sample primarily consists of high school and university students, who may differ from other generational cohorts or working-age populations in their media habits and cognitive responses to news overload. Secondly, while the model offers useful information about the psychological and behavioral mechanisms linking news overload to news avoidance and social filtering, the adjusted R^2 values for news efficacy (0.070) and social filtering (0.115) indicate that the explanatory power for these constructs is relatively modest. This suggests that additional factors not included in the current model, such as media literacy, trust in news sources, algorithmic awareness, and personality traits, may significantly influence these outcomes. Lastly, although this study employs robust structural equation modeling techniques, its cross-sectional design limits causal inference. Longitudinal studies would help capture how prolonged exposure to news overload affects digital news behaviors and coping strategies over time. Moreover, incorporating qualitative or mixed-methods approaches could reveal latent psychological dimensions, such as emotional resilience, peer influence, and perceived social norms, that are difficult to capture quantitatively.

Future research should aim to address these gaps by incorporating a wider range of explanatory variables, especially sociocultural and platform-level factors, to improve the explanatory power of models involving news efficacy and filtering behaviors. Cross-cultural comparative studies could provide valuable information about how cultural orientations (e.g., collectivism vs. individualism) mediate responses to news overload. Additionally, qualitative or mixed-methods approaches may uncover latent variables such as peer influence, algorithmic literacy, or institutional trust that are difficult to quantify in a purely structural model. Longitudinal research is also essential to understand

how prolonged exposure to news overload shapes digital news behaviors over time. Finally, examining the role of emerging technologies, such as AI-driven news recommendation systems or personalized filtering tools, could inform the development of user-centered interventions aimed at enhancing news literacy and reducing cognitive fatigue in increasingly saturated media environments.

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Branded music videos on YouTube and their associations with brand awareness among Vietnamese youth

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Abstract

In the context of accelerating digitalization, social media platforms have reshaped branding and advertising practices, encouraging entertainment-oriented communication strategies. Focusing on Vietnam and its digitally engaged Generation Z audience, this study examines how cue-specific attention to branded music videos (BMVs) on YouTube is associated with brand awareness, operationalized as two memory-based brand-identification outcomes: aided brand recognition and contextual brand retrieval (recall-proxy). A cross-sectional survey was administered to Vietnamese Generation Z respondents who regularly use YouTube and reported familiarity with at least five of ten preselected BMVs ($n = 305$). Using descriptive statistics and multivariate ordinary least squares (OLS) regression with robust standard errors in STATA, the study tests whether self-reported attention to specific BMV elements, particularly lyrics and slogans, is associated with the two brand-identification outcomes. Results suggest an asymmetric pattern across the two dimensions of brand awareness. Attention to slogans shows a positive and statistically significant association with contextual brand retrieval ($p < 0.05$), whereas attention to lyrics shows only marginal evidence of association with aided brand recognition ($p < 0.10$). Other measured visual and narrative elements do not demonstrate statistically significant associations in the models, and overall explanatory power is modest. Taken together, the findings indicate that verbal/auditory cues may be more closely linked to brand-identification outcomes than other elements in music-oriented, multitasked YouTube consumption contexts. By integrating brand

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awareness theory and music video theory, this study contributes empirical evidence from a non-Western market and offers practical implications for designing BMVs aligned with specific branding objectives (retrieval-oriented vs. recognition-oriented awareness).

Keywords

Branded music video, brand awareness, aided brand recognition, contextual brand retrieval (recall-proxy), YouTube, digital advertising.

Introduction

Vietnam's digital transformation has accelerated rapidly in recent years, driven by national strategies aimed at expanding digital infrastructure and promoting digital adoption across sectors (Vo, & Dao, 2025). Within this broader digital ecosystem, online platforms play an increasingly important role in shaping communication, entertainment, and advertising practices. Among these platforms, YouTube has emerged as a dominant medium in Vietnam, with approximately 63 million users in 2023, particularly popular among younger generations such as Generation Y and Generation Z (Digital 2023: Vietnam, 2023). Within this evolving media landscape, branded music videos have gained increasing prominence as an advertising format that integrates brand elements – such as logos, slogans, and products – into music content through lyrics, visuals, and narrative structures, often featuring popular Vietnamese artists. High-profile campaigns such as Lac troi (Biti's & Son Tung M-TP) and Dive nha (Honda & Den Vau) demonstrate the emotional resonance and cultural visibility of this format among young audiences.

Despite their growing popularity, branded music videos (BMVs) remain underexplored in Vietnamese academic research. Existing studies on digital advertising in Vietnam have largely focused on social commerce, influencer marketing, or short-form content on platforms such as Facebook² and TikTok (Nguyen, 2023; Nguyen Thi Phuong et al., 2025). Moreover, much of the broader scholarship on branded entertainment and music-based advertising is grounded in Western contexts, raising questions about its generalizability to Vietnam's distinctive media environment, cultural consumption patterns, and youth audiences. More importantly, beyond the macro-level question of whether BMVs “work,” a key unresolved issue is how different embedded cues within music videos may shape distinct dimensions of brand awareness.

Brand awareness is commonly conceptualized as comprising at least two

² Belongs to Meta company, banned at the territory of the Russian Federation.

memory-based outcomes: brand recall and brand recognition. Recall typically requires retrieving a brand from memory in response to a need state, whereas recognition involves identifying a brand when cues are present (Keller, 2003). In digital music video settings – where viewers often multitask and where brand cues can be delivered verbally (lyrics/slogans) and visually (logos/products) – these two outcomes may not be affected in the same way. Prior research suggests that music-based brand placements can enhance engagement and influence consumer responses (Davtyan et al., 2020). However, empirical evidence remains limited in emerging markets such as Vietnam, and existing work rarely isolates which types of embedded cues (e.g., lyrical references versus slogans or visual placements) are more strongly associated with recall versus recognition. This gap is particularly relevant given that Vietnamese Generation Z audiences rely heavily on YouTube for music consumption and entertainment, making BMVs a strategically important yet insufficiently understood form of digital persuasion.

Against this backdrop, the present study examines how BMVs on YouTube are associated with brand awareness among Vietnamese Generation Z audiences, with a specific focus on brand recall and brand recognition. Rather than treating BMVs as monolithic, the study focuses on audience attention to specific embedded brand cues and tests whether attention to different cue types is associated with recall and recognition in distinct ways. In this study, brand awareness is operationalized using survey-based brand-identification tasks, namely aided brand recognition and contextual brand retrieval (recall-proxy). Accordingly, the study addresses the following research questions. First, to what extent is audience attention to embedded brand cues in YouTube BMVs associated with brand recall among Vietnamese Generation Z audiences (RQ1)? Second, to what extent is audience attention to embedded brand cues in YouTube BMVs associated with brand recognition among Vietnamese Generation Z audiences (RQ2)? Third, do the associations differ between brand recall and brand recognition, indicating cue-specific patterns across the two awareness dimensions (RQ3)?

Drawing on the theoretical frameworks discussed in the following section, this study contributes to branded entertainment and digital advertising research by distinguishing recall from recognition and providing evidence from a non-Western, emerging-market YouTube context.

Literature review

Digital advertising and branded content

The transition from traditional mass media to digital environments has

reshaped contemporary advertising and communication practices, supported by advances in connectivity, data analytics, and multimedia technologies. Digital advertising is commonly discussed in relation to the technologies and business models underpinning online advertising, including data-enabled ad delivery and measurement in digital ecosystems (Dens, & Poels, 2023; Shanahan, & Kurra, 2011). In emerging markets such as Vietnam – where Internet penetration and smartphone adoption have increased rapidly – digital platforms have become central infrastructures for brand-mediated communication and audience engagement (Le, & Ratten, 2021).

Within this evolving media environment, branded content has emerged as a prominent form of brand communication that integrates brand meanings into informational or entertainment-oriented media. The evidence from core scholarly definitions supports this characterization. Branded content has been defined as content that is fully or partly funded by a brand and designed to make audiences choose to engage based on entertainment, informational, or educational value. It has also been characterized as a fusion of advertising and entertainment that is integrated into an organization's broader brand strategy and distributed as entertainment content with a highly branded quality (Dens, & Poels, 2023; Horrigan, 2009).

Empirical work further suggests that branded content can shape consumer experiences and downstream brand outcomes in digital settings, although effectiveness may vary depending on execution and context. For instance, studies on branded content experience in social media emphasize how consumer experience and engagement mechanisms help explain branded content's effects beyond mere exposure (Waqas et al., 2022). Cross-cultural evidence also indicates that branded content appeals (e.g., entertainment appeal) and users' motivations for social media use can jointly predict brand-related outcomes, underscoring the importance of audience-centered mechanisms in branded content effectiveness (Buzeta et al., 2024).

Recent scholarship additionally highlights that branded content, and related formats (e.g., native advertising) have become embedded in contemporary media business models, as media organizations develop dedicated branded content teams and studios to produce these formats – raising practical and ethical considerations about the integration of commercial content into editorial environments (Carvajal, & Barinagarrementeria, 2021). Within this broader shift, branded entertainment formats that combine cultural production and commercial communication have gained increasing relevance.

Among branded entertainment formats, BMVs represent a distinctive

manifestation of branded content, integrating music, visual aesthetics, and narrative storytelling with embedded brand cues delivered through both auditory (e.g., lyrics, slogans) and visual (e.g., logos, products) channels. Despite their growing presence on digital platforms – particularly YouTube – academic research on music-based branded communication remains limited, especially in emerging digital markets where media practices, cultural consumption patterns, and audience–brand relationships may differ from those observed in Western contexts. This motivates closer investigation of how such embedded cues function in context-specific ways within Vietnam’s contemporary digital advertising landscape. Recent studies also highlight the growing influence of digital platforms in shaping contemporary media consumption patterns and audience engagement, particularly among younger audiences who increasingly rely on online media environments for information and entertainment (Vu, 2025; Ahmed, 2024).

YouTube as a distribution platform for BMVs

YouTube has established itself as the world’s largest video-sharing platform and a central hub for platform-based audiovisual media consumption. As a user-generated content platform supported by large-scale recommendation and ranking systems, YouTube facilitates the discovery and circulation of video content and can sustain visibility through algorithmically shaped exposure pathways. These characteristics make it a key infrastructure for contemporary digital advertising and brand-mediated communication in platform environments (Covington et al., 2016). At the same time, algorithmic visibility does not guarantee attention or persuasion, as user choice and context of viewing shape what is processed and remembered. Its participatory features – such as liking, commenting, and sharing – enable continuous interaction between content, audiences, and brands, which can extend audience engagement and increase the diffusion potential of brand-related messages beyond initial viewing (Dehghani et al., 2016; Khan, 2017).

From a strategic perspective, YouTube has become an important distribution environment for branded content because content can gain reach not only through paid promotion but also through algorithmic visibility and audience-driven circulation. However, the effectiveness of branded communication on YouTube is contingent rather than guaranteed: users retain high control over viewing choices, attention can be fragmented, and overt persuasion may trigger avoidance. Accordingly, the outcomes of branded communication are likely to depend on how brand cues are integrated into the viewing experience and how audiences interpret persuasive intent in a high-choice, ad-saturated

environment (Dehghani et al., 2016; Khan, 2017).

Within the broader YouTube media ecosystem, music-related content occupies a particularly prominent position. YouTube functions not only as a video-sharing platform but also as a major channel for music discovery and everyday music consumption, especially among younger audiences. This dual role allows music videos to operate simultaneously as cultural media artefacts and strategic communication vehicles, creating opportunities for brands to be embedded within audiovisual storytelling through both visual cues (e.g., logos, products) and auditory/verbal cues (e.g., lyrics, slogans).

Research on brand placement in music videos suggests that product placement practices in highly viewed music videos on YouTube show evolving patterns in how brands are inserted and contextualized within audiovisual content (Marques Cuadra, & Sedeño Valdellós, 2017). Related work also indicates that audience perceptions of authenticity and their relationships with artists can shape how viewers interpret and respond to brand appearances in music videos, thereby influencing cognitive responses to embedded brand cues (Thornton, & Burkhalter, 2015). Despite YouTube's centrality for distributing music-based content, much academic research has concentrated on influencer-generated videos, vlogs, or skippable pre-roll advertising formats. Consequently, BMVs remain underexamined as a distinct form of platform-based advertising communication. This limitation is especially salient beyond Western contexts, where cultural values and platform usage patterns may shape video consumption and audience responses in ways that are not fully captured by Western-centric evidence (Park et al., 2017). Taken together, these gaps motivate closer investigation of BMVs on YouTube in emerging markets such as Vietnam, including how embedded cues within such content may relate to brand awareness outcomes.

BMVs and their associations with brand awareness

BMVs operate at the intersection of music, visual aesthetics, and brand communication, functioning as a form of branded entertainment in which commercial cues are embedded within culturally resonant audiovisual content. Rather than relying on interruptive advertising formats, BMVs typically integrate brands into the music video's audiovisual discourse, enabling brands to be encountered in contexts that audiences may approach primarily as entertainment. Evidence from music-video placement research suggests that brand appearances can vary from subtle integration to more imposed insertions while remaining recognizable to viewers, highlighting the strategic importance

of how brands are embedded within the narrative and aesthetics of the video (Sánchez-Olmos et al., 2019).

Brand awareness is widely conceptualized as a multidimensional construct comprising at least two key components: brand recall and brand recognition. Brand recall refers to an individual's ability to retrieve a brand from memory when prompted by a product category or consumption situation, whereas brand recognition concerns correctly identifying a brand when exposed to relevant cues. These dimensions reflect different memory processes and are commonly used to evaluate the effectiveness of marketing communications and branded content (Keller, 2003).

Prior empirical research indicates that brand integrations in music-video contexts can affect consumer outcomes, though effects depend on execution characteristics. For instance, experimental work shows that the repetition of brand placements in music videos can improve brand memory and can also influence downstream outcomes such as attitudes and behavioral intentions, with effects varying by exposure levels (Davtyan et al., 2020). Related findings also show that placement outcomes can depend on how the brand is linked to on-screen characters and the perceived prestige of the brand, which can shape consumer interest within a music-video context (Thornton, & Burkhalter, 2015). In addition, qualitative research highlights that viewers' relationships with recording artists and perceptions of authenticity can shape how audiences interpret brand appearances in music videos, suggesting that meaning-making processes may mediate whether brand cues translate into positive brand knowledge (Burkhalter et al., 2017).

At the same time, existing scholarship on music-based brand integration has tended to emphasize visual prominence (e.g., logos/products on screen) and exposure characteristics (e.g., repetition), whereas comparatively less attention has been paid to verbal brand cues, such as brand name placements in lyrics or slogans integrated into musical narratives. Recent content-analytic work examining both lyrics and music videos in global streaming charts highlights that lyric-based brand placement is not rare, yet its cognitive effects remain less consistently tested than visual prominence in the music-video placement literature. This is notable because experimental evidence in adjacent music-based contexts shows that brand name placements in song lyrics – especially when accompanied by disclosure – can affect brand awareness outcomes, underscoring the need to consider verbal modalities alongside visual cues when theorizing brand awareness effects in BMVs (Van Vaerenbergh, 2017).

Theoretical framework

This study is grounded in two complementary theoretical frameworks: Brand Awareness/Brand Equity theory (Aaker, 1991) and customer-based brand equity (Keller, 1993), alongside Andrew Goodwin's music video framework (Goodwin, 1993). Together, these perspectives provide a conceptual lens for examining how brand cues embedded in music-video aesthetics and narratives may relate to consumer perception and memory-based brand awareness outcomes, including brand recall.

Brand awareness theory

Brand awareness refers to a consumer's ability to identify a brand under different memory conditions, commonly discussed through two related components: brand recognition and brand recall (Aaker, 1991; Keller, 1993). Brand recognition is the ability to confirm prior exposure to a brand when relevant cues are present (e.g., seeing the brand name or logo), whereas brand recall refers to retrieving the brand from memory when prompted by a product category or a consumption situation (e.g., needing to buy/use a product) (ibid). This distinction and its strategic implications have been further elaborated in advertising and branding research, which differentiates recognition-based versus recall-based awareness objectives (Percy, & Rossiter, 1992; Rossiter, 2014; Rossiter, & Percy, 1997). Because recall is generally more retrieval-intensive while recognition is more cue-dependent, these components may play different roles in consumer decision-making, where awareness can function as a salient heuristic influencing choice (Hoyer, & Brown, 1990; Macdonald, & Sharp, 2000).

In this study, brand awareness is examined in the context of YouTube BMVs, where brand cues can be delivered through multiple modalities (verbal/auditory cues such as lyrics or slogans, and visual cues such as logos or products). Accordingly, we operationalize brand awareness using two brand-identification outcomes aligned with the survey design: (1) a contextual brand retrieval (recall-proxy) measure based on a need-state prompt, and (2) an aided brand recognition measure based on identifying brands associated with the stimulus BMVs. Because both measures rely on list-based responses, they should be interpreted as cued/aided memory performance rather than pure unaided recall.

Keller (1993) also highlights the depth and breadth of brand awareness, referring to the ease with which a brand comes to mind and the range of situations in which it is retrieved. In digital media environments, these memory outcomes

may be shaped by repeated and multimodal exposure; however, the extent to which exposure translates into recall versus recognition can vary depending on execution, platform context, and fragmented attention patterns typical of YouTube use. In BMVs specifically, brand awareness may thus depend not only on visual exposure to logos or products but also on how brand cues are integrated into musical composition, lyrics, slogans, and audiovisual storytelling.

Goodwin's music video theory

In *Dancing in the Distraction Factory* (1992), Andrew Goodwin proposed a framework for analyzing music videos based on seven key features:

1. Genre characteristics: Music videos reflect stylistic traits of the music genre.
2. Lyrics–visual relationship: Visuals may illustrate, amplify, or contradict the song's lyrics.
3. Music–visual relationship: Editing often aligns with musical tempo and rhythm.
4. Artist focus: Frequent close-ups emphasize the artist's persona and identity.
5. Visual motifs: Artists often develop recurring visual symbols across videos.
6. Voyeurism: The camera may adopt a voyeuristic gaze, often sexualising bodies for visual appeal.
7. Intertextuality: References to cinema, television, or pop culture are common.

These features not only shape the aesthetic experience but also shape how audiences interpret and decode the content. When applied to BMVs, this framework helps explain how brand elements may be woven into music and visuals, potentially guiding attention and supporting memory-based outcomes. In this study, Goodwin's framework motivates examining music-video relationships such as lyrics–visual relations, music–visual editing, artist focus, and narrative/storytelling as contexts within which brand cues (verbal and visual) are embedded.

Integrating the two frameworks

Combining these two frameworks allows for a multidimensional analysis of BMVs, addressing both cognitive (brand awareness) and aesthetic-symbolic (music video) dimensions. While Aaker and Keller provide insights into the mechanisms behind brand memory formation, Goodwin offers tools for dissecting the audiovisual and lyrical integration of brand messages.

This integrated model is applied to analyze how music, visuals, artists, and branding coalesce in BMVs distributed on YouTube, and how these components may relate to brand awareness among young Vietnamese consumers – particularly those belonging to Generation Z. Specifically, the framework motivates examining attention to verbal cues (e.g., lyrics, slogans, brand-name mentions) and visual cues (e.g., logos, products), alongside music-video elements (e.g., music type, artist focus, and story) that may condition how such cues are processed. This integration aligns with the research questions by linking cue-specific attention in BMVs to the two dimensions of brand awareness (recall vs. recognition).

Research methodology

Research design

This study adopts a quantitative research approach to examine the associations between BMVs and brand awareness among Generation Z consumers in Vietnam. The research focuses on analyzing the relationship between independent variables – operationalized as respondents' self-reported attention to musical, visual, and branding cues in BMVs – and the dependent variables, namely brand recognition and brand recall, the two key components of brand awareness as defined by Aaker (1991) and Keller (1993).

A structured survey questionnaire was developed to collect data, with items specifically designed to measure consumers' responses to selected BMVs on the YouTube platform. The survey was administered as a cross-sectional questionnaire. The study employs a deductive research strategy, beginning with established theoretical frameworks and examining the research questions through statistical analysis.

Sampling and data collection

The study population included Vietnamese individuals aged 15–30 who regularly use YouTube. To ensure participants were familiar with BMVs content, they were required to confirm having watched at least five out of ten preselected BMVs (self-reported, details are provided in *Table 1* below). Participants were recruited using non-probability (convenience/purposive) sampling via an online survey link distributed through social media and university student networks.

Branded music videos on YouTube and their associations
with brand awareness among Vietnamese youth

Table 1

List of branded music videos

Name of branded music video	Music artists	Likes	Channel posting	Company	Product type
Lac troi (2016)	Son Tung MTP	1,800,000	@Sontungmtp	Biti's	Sneakers
Di de tro ve (2017)	Soobin Hoang Son	386,000	@1989sEntertainment	Biti's	Sneakers
Chuyen cu bo qua (2018)	Bich Phuong	524,000	@BICHPHUONGOFFICIAL	Suntory PepsiCo	Soft drink
Sang mat chua (2019)	Truc Nhan	878,000	@trucnhanchannel	Tiki	E-commerce platform
Di ve nha (2020)	Den Vau & JustaTee	1,400,000	@DenVau1305	Honda	Motorcycle
Em be (2020)	Amee & Karik	391,000	@St319Entertainment	Beamin	Food delivery mobile app
Em la chau bau (2020)	Tlinh & MCK	372,000	@POPSMUSIC	PNJ	Jewelry
Tet no lo (2022)	Bich Phuong	64,000	@BICHPHUONGOFFICIAL	Suntory PepsiCo	Soft drink
Tet xa hoi, lam gi canggg (2023)	Truc Nhan & Phao	47,000	@trucnhanchannel	Nestlé	Food
Tet on roi (2023)	Dong Nhi, Hien Thuc, Bui Cong Nam & Jun Pham	33,000	@SingerDongNhiOfficial	Unilever	Personal care

Source: Author (2024)

Stimuli selection and sampling strategy

The selection of the ten BMVs was based on three criteria:

- Popularity: Each video had accumulated over 30,000 likes on YouTube as of January 2024.
- Brand diversity: The selected music videos represented eight different product categories, including sneakers, soft drinks, e-commerce platforms, motorcycles, delivery services, jewelry, chocolate, and personal care products.
- Cultural and temporal relevance: All featured artists were young Vietnamese musicians, aged between 26 and 44, who are active in the contemporary Vietnamese music scene.

A non-probability purposive sampling method was employed in combination with snowball sampling, using popular social networking platforms such as Facebook³ and Zalo for distribution.

Over a period of three weeks, the study collected a total of 345 survey responses, of which 305 were deemed valid and retained for analysis. Invalid responses were excluded based on the following criteria: respondents under 15 or over 30 years of age, non-users of YouTube, or those who reported watching fewer than five of the selected BMVs⁴.

Ethical considerations

This study followed standard ethical principles for social science research involving human participants. Before starting the survey, all respondents received an information sheet explaining the study's purpose, what participation involved, the voluntary nature of participation, and how the data would be used. Consent was obtained electronically before any survey questions were displayed. Participants were informed that they could discontinue the survey at any point without any negative consequences, and that only anonymized responses would be analyzed.

Because some respondents were under the age of 18, additional safeguards were applied. The survey began with an age-screening question (age-gating)

³ Belongs to Meta company, banned at the territory of the Russian Federation.

⁴ This sample size is appropriate for Exploratory Factor Analysis (EFA) and purposive sampling, following the guidelines by Hair et al. (2014), who recommend a minimum of 50 observations, ideally more than 100, with a subject-to-variable ratio ranging from 5:1 to 10:1 – some scholars suggest up to 20:1. Applying the 20:1 rule to this study would require at least 180 observations. With 305 valid responses, the sample size exceeds the recommended threshold, yielding a ratio of approximately 34:1. This ensures both reliability and generalizability for the quantitative analysis.

before participants could access the main questionnaire. Respondents who reported being under 18 were shown an additional assent/consent screen requesting (a) the participant's assent and (b) confirmation that permission had been obtained from a parent or legal guardian to take part. Only those who provided both confirmations were allowed to proceed to the questionnaire; otherwise, respondents were screened out and could not proceed. Survey data were stored securely and accessed only by the research team for analysis. No personally identifiable information (e.g., names, emails, phone numbers, IP addresses) was collected, and responses were recorded anonymously to protect confidentiality. The study did not involve deception and posed minimal foreseeable risk. Data were used solely for academic purposes and reported only in aggregate form.

Variables and measurement scales

The study employed a structured survey instrument consisting of 14 observed variables. Independent variables captured respondents' self-reported attention to key elements of BMVs and embedded brand cues, measured on a five-point Likert scale ranging from 1 (very inattentive) to 5 (very attentive). Music-video factors included attention to music type, lyrics, visuals, artist presence, and storyline. Brand-related factors included attention to product placement, logo visibility, brand-name mentions, and slogan integration.

Brand awareness was operationalized using two memory-based brand-identification outcomes aligned with the survey format: brand recognition and brand recall. Brand recognition was measured as an aided recognition task in which respondents identified which brands they recognized as appearing in the selected BMVs. Brand recall was measured as a contextual brand retrieval task (hereafter, recall-proxy) using a consumption-related prompt (need-state framing) in which respondents indicated which advertised brands/products they remembered in connection with the stimulus BMVs (multiple-response format). Responses were coded at the brand level (correct = 1; otherwise = 0) and aggregated across the ten stimulus brands (see *Table 2*). Because both outcomes rely on list-based responses and no decoy brands were included, they are interpreted as cued/aided brand-identification performance rather than pure unaided recall.

Demographic variables, including age and gender, were included as control variables in the regression models. Behavioral indicators related to YouTube use intensity were collected to describe the sample and contextualize exposure patterns, but were not retained in the main specification to preserve

model parsimony given the study's primary focus on cue-specific attention variables.

Data analysis

After data collection, responses were screened for validity. Only participants who met the eligibility criteria (Vietnamese YouTube users aged 15–30) and who reported having watched at least five out of the ten selected BMVs ($\geq 50\%$ familiarity) were retained for analysis, resulting in 305 valid cases. Therefore, findings should be interpreted as associations observed among respondents with minimum familiarity rather than confirmed exposure to all ten stimuli.

Data analysis proceeded in two steps. First, descriptive statistics were computed to summarize respondent characteristics (age, gender) and key study variables. Second, to examine the associations between cue-specific attention and brand awareness outcomes, we estimated multivariate regression models using ordinary least squares (OLS) in STATA with robust standard errors. The analysis focused on two memory-based brand-identification outcomes aligned with the survey design: (1) contextual brand retrieval (recall-proxy) and (2) aided brand recognition.

Both outcomes were coded at the brand level and then aggregated across the ten stimulus brands. For each stimulus brand j ($j = 1 \dots 10$), a correct selection was coded as 1 and an incorrect/non-selection as 0. The recall-proxy score was computed as the sum of correct contextual retrieval responses across the ten stimulus brands (0–10). The aided brand recognition score was computed as the sum of correctly recognized brands across the ten stimulus brands (0–10). Because the brand-identification items used list-based responses and did not include decoy brands, these outcomes are interpreted as cued/aided memory performance rather than pure unaided recall.

For ease of interpretation and comparability across models, the summed scores (0–10) were additionally expressed as proportions by dividing by 10 (0–1) in the regression analyses.

Independent variables included self-reported attention to music-video elements and embedded brand cues measured on 5-point Likert scales (1 = very inattentive; 5 = very attentive), alongside control variables (age and gender). Statistical significance was evaluated using conventional thresholds ($p < 0.10$, $p < 0.05$, $p < 0.01$). The details of each variable and coding procedures are reported in Table 2.

Model specification:

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \epsilon_i$$

where Y_i either contextual brand retrieval (recall-proxy) or aided brand recognition; X_1 includes respondent characteristics (age, gender); X_2 includes music-video attention variables (music type, lyrics, visuals, artist, story); and X_3 includes brand-cue attention variables (product, logo, slogan, brand name); and ϵ_i is the error term.

The detail of each variable is shown in *Table 2* below.

Finally, we acknowledge that an ideal measurement design would implement a sequential two-step procedure (unaided recall followed by aided recognition with distractors) to strengthen construct validity. This is discussed as a key direction for future research.

Table 2

Description of variables

Variable group	Variable name	Survey item	Scale	Coding / construction
Brand awareness (Dependent variables)	Contextual brand retrieval (Recall-proxy)	When you need to buy/use a product or service, which advertised brand/product from the BMVs do you remember? (Multiple answers)	Multiple choice (check-all-that-apply)	For each stimulus brand j ($j = 1 \dots 10$), correct selection = 1; otherwise = 0. Raw recall-proxy score = $\sum \text{recall}_j$ (0–10). For regression analyses, the raw score was divided by 10 to obtain a proportion (0–1). No decoy brands included.
	Aided brand recognition	Which brands do you recognize as appearing in the BMVs? (Multiple answers)	Multiple choice (check-all-that-apply)	For each stimulus brand j ($j = 1 \dots 10$), correct recognition = 1; otherwise = 0. Raw recognition score = $\sum \text{recognition}_j$ (0–10). For regression analyses, the raw score was divided by 10 to obtain a proportion (0–1). No decoy brands included.

Variable group	Variable name	Survey item	Scale	Coding / construction
Personal characteristics (X1)	Age	Year of birth	Numerical	Age calculated from year of birth
	Male	Gender	Nominal	Male = 1; Female = 0
YouTube use / exposure (Control & screening)	YouTube_use_freq	Average daily YouTube use	Ordinal (categorical)	Code based on questionnaire categories (e.g., 1 = <1 hour/day; 2 = 1–2 hours; 3 = 2–3 hours; 4 = >3 hours)
	bmv_familiarity_count	How many of the 10 selected BMVs have you watched?	Numerical (0–10)	Self-reported count of watched BMVs; used for screening (retain if ≥5/10) and may be used for robustness checks
Music video attention variables (X2)	music_type	Attention to music type in the MV	5-point Likert	1 = very inattentive; 5 = very attentive
	lyric	Attention to lyrics in the MV	5-point Likert	1 = very inattentive; 5 = very attentive
	visual	Attention to visuals in the MV	5-point Likert	1 = very inattentive; 5 = very attentive
	artist	Attention to artist in the MV	5-point Likert	1 = very inattentive; 5 = very attentive
	story	Attention to storyline in the MV	5-point Likert	1 = very inattentive; 5 = very attentive
Brand-cue attention variables (X3)	product	Attention to product in the MV	5-point Likert	1 = very inattentive; 5 = very attentive
	logo	Attention to logo in the MV	5-point Likert	1 = very inattentive; 5 = very attentive
	slogan	Attention to slogan in the MV	5-point Likert	1 = very inattentive; 5 = very attentive
	brand_name	Attention to brand name in the MV	5-point Likert	1 = very inattentive; 5 = very attentive

Source: Author (2024)

Findings

Sample characteristics and YouTube usage patterns

The final dataset consisted of 305 valid responses from Vietnamese Generation Z participants. Following Pew Research Center’s classification, Generation Z refers to individuals born between 1997 and 2012 (Dimock, 2019). The sample exhibited a relatively balanced gender distribution (46.6% male; 53.4% female) (see Table 3).

Table 3

Statistics describing the demographics of the study sample

Character	Frequency	Proportion	
Gender	Male	142	46.6%
	Female	163	53.4%
Year of birth (age)	2009 (15)	26	8.52%
	2008 (16)	25	8.20%
	2006 (18)	26	8.52%
	2005 (19)	26	8.52%
	2004 (20)	23	7.54%
	2003 (21)	24	7.87%
	2002 (22)	32	10.49%
	2001 (23)	26	8.52%
	2000 (24)	23	7.54%
	1999 (25)	25	8.20%
	1998 (26)	24	7.87%
1997 (27)	25	8.20%	

Source: Author (2024)

Respondents ranged in age from 15 to 27 (born 1997–2009), representing multiple cohorts within Generation Z. Generation Z is often described as “digital natives” due to growing up with pervasive digital technologies (Prensky, 2001), although the empirical basis and implications of “digital nativity” have been widely debated in the scholarly literature (Bennett et al., 2008; Kirschner, & De Bruyckere, 2017). Prior research also suggests strong Generation Z engagement with smartphone-mediated digital media use (Mason et al., 2022). In addition, digital video platforms such as YouTube are increasingly used for music consumption, where users may “listen” to music videos rather than continuously

watch them (Beuscart et al., 2022). In Vietnam, recent empirical work likewise documents distinctive technology habits among Generation Z (Quỳnh, & Hương, 2022) and broader management research indicates Generation Z’s preference for flexible/hybrid work arrangements (Osorio, & Madero, 2025).

Respondents reported high levels of YouTube use: 34.4% used YouTube for less than one hour per day, 32.5% for 1–2 hours, 27.9% for 2–3 hours, and 5.2% for more than three hours (see Table 4). In addition, 55.7% reported that at least half of their YouTube time was spent watching music videos. These patterns are consistent with YouTube’s role as a major music consumption platform among Generation Z audiences in Vietnam (Chusna, 2018).

Table 4

Descriptive statistics of YouTube usage habits of the research sample

Characteristic	Category	Frequency	Proportion
Time to use YouTube for 1 day	Less than 1 hour	105	34.4%
	From 1 to 2 hours	99	32.5%
	From 2 to 3 hours	85	27.9%
	Over 3 hours	16	5.2%
Percentage of time spent watching MVs	Less than 25 %	65	21.3%
	From 25% to 50%	70	23%
	From 50% to 75%	94	30.8%
	Over 75%	76	24.9%

Source: Author (2024)

Associations between BMV elements and aided brand recognition

Table 5 reports the OLS regression results examining associations between cue-specific attention to BMV elements and aided brand recognition. The dependent variable is measured as a proportion (0–1), derived from the number of correctly identified stimulus brands divided by 10. Among the music-video variables, attention to lyrics shows a positive association with aided brand recognition ($\beta = 0.0131$, $p = 0.089$), indicating that higher self-reported attention to lyrics is associated with slightly higher brand-identification performance when prompted.

Table 5

**OLS regression results: associations between BMV cue attention
and brand awareness outcomes**

Variables	Aided brand recognition (β)	Aided brand recognition ($P > t $)	Contextual brand retrieval / Recall-proxy (β)	Contextual brand retrieval / Recall-proxy ($P > t $)
Male	-0.00635	0.742	0.00369	0.858
Age	-0.000114	0.965	-0.00219	0.442
Music_type	0.00485	0.496	-0.000634	0.993
Lyric	0.0131*	0.089	0.0113	0.166
Visual	0.0109	0.138	0.00705	0.350
Artist	-0.000249	0.976	-0.0111	0.214
Story	-0.00309	0.669	-0.00838	0.276
Product	-0.0111	0.198	-0.00893	0.340
Logo	0.00905	0.313	0.0148	0.118
Slogan	0.0127	0.140	0.0195**	0.036
Brand_name	0.00494	0.564	0.00464	0.616
Constant	0.603***	0.000	0.671***	0.000
Observation	305		305	
R-squared	0.029		0.038	
<i>Robust standard errors were used to compute p-values. *p<0.10, **p<0.05, ***p<0.01</i>				

Source: Author (2024)

Other music-video elements, including visuals, music type, and brand-related variables such as logo and product, show coefficients that are not statistically significant. Variables such as artist and story exhibit negative coefficients, but these associations do not reach statistical significance. Demographic controls (age and gender) are also not significantly associated with aided brand recognition in this specification. Overall, the findings suggest that verbal cues reflected in attention to lyrics may be more closely associated with aided brand recognition than the other measured visual or narrative elements in this dataset.

Associations between BMV elements and contextual brand retrieval

The regression results for contextual brand retrieval (recall-proxy) show a different pattern of associations. As shown in *Table 5*, attention to slogans is the only variable demonstrating a statistically significant positive association with recall-proxy ($\beta = 0.0195$, $p < 0.05$). This suggests that respondents who reported paying greater attention to brand slogans embedded in BMVs tend to report higher contextual brand retrieval scores in the aided brand-identification task.

Other elements related to music-video content and brand presentation, including lyrics, visuals, logo, product, and brand name, do not show statistically significant associations with recall-proxy. Several variables (e.g., age, artist, and story) exhibit negative coefficients, but these associations do not reach statistical significance.

Taken together, the findings suggest asymmetric associations across the two brand-identification outcomes. While attention to lyrics shows modest evidence of association with aided brand recognition, attention to slogans is more strongly associated with contextual brand retrieval (recall-proxy) among Vietnamese Generation Z respondents. These results should be interpreted as associations rather than causal effects.

Discussion

Contextual brand retrieval (recall-proxy) in BMVs

The findings suggest that contextual brand retrieval (recall-proxy) associated with BMVs appears selective and is most consistently associated with attention to slogans. Among the examined variables, attention to slogans is the only element that demonstrates a statistically significant positive association with recall-proxy. This pattern suggests that verbal cues may be more closely associated with contextual retrieval outcomes than the other measured visual or narrative elements in this dataset.

From a cognitive perspective, retrieval-oriented brand awareness involves accessing brand-related information from memory, and retrieval is more likely when cues are linguistically salient and repeatedly encountered in the viewing/listening experience (Keller, 1993). Given that the retrieval outcome in this study was assessed using a list-based aided format, slogans may function as verbal anchors that support contextual brand identification when respondents are asked to indicate brands/products associated with the stimulus set. Prior research has highlighted slogans as an integral element of brand positioning and as a key object of consumer memory, with marketplace evidence examining what drives

slogan recall and how slogans are linked to brand-related evaluations (Briggs, & Janakiraman, 2017; Kohli et al., 2007, 2015). Recent work further suggests that linguistic properties of slogans relate systematically to how memorable slogans are, reinforcing the relevance of verbal design choices for memory outcomes (Hodges et al., 2024).

The prominence of slogans in this study can also be interpreted in light of YouTube music consumption practices, where users often “listen” to music videos rather than continuously watch them, implying that auditory/verbal layers may receive relatively sustained attention in everyday use (Beuscart et al., 2022; Dasovich-Wilson et al., 2022). This attention pattern is consistent with broader evidence that brand placements in music videos can be linked to memory outcomes, although associations may depend on execution factors such as repetition and how cues are encountered (Davtyan et al., 2020). Taken together, these considerations may help explain why other brand-related variables do not show statistically significant associations with recall-proxy in the model.

Importantly, the results caution against assuming that the mere presence of brand elements in music videos is sufficient to support retrieval-oriented brand awareness. Instead, the findings point to the potential relevance of explicit, linguistically salient cues (e.g., slogans) in music-based branded content, while recognizing that the present evidence reflects associations rather than causal effects.

Aided brand recognition in BMVs

In contrast to contextual brand retrieval (recall-proxy), aided brand recognition shows a different pattern. The analysis provides marginal evidence of a positive association between attention to song lyrics and aided brand recognition ($p = 0.089$). While this does not meet the conventional threshold of statistical significance ($p < 0.05$), it suggests that lyrics may serve as a potentially relevant, albeit limited, channel through which brand information is identified when respondents are prompted.

This pattern is consistent with the idea that auditory and linguistic processing can matter for recognition in music-based branded content. Prior work on brand mentions and placements in music-related contexts indicates that verbal brand cues (e.g., lyric-based placements) can be noticed and processed by listeners, with implications for brand memory outcomes under cueing conditions (Delattre, & Colovic, 2009; Van Vaerenbergh, 2017). For Generation Z audiences, who often use YouTube as a music-streaming platform rather than a purely visual medium,

lyrics may function as an accessible layer of the viewing/listening experience through which brand information can be detected and later recognized when prompted (Beuscart et al., 2022). More broadly, this interpretation is consistent with research showing that digital media environments shape younger users' practices through platform-specific forms of access, participation, and content engagement (Chobanyan, 2020; Gjylbegaj, & Radwan, 2024; Wei, & Ong, 2025). From a customer-based brand equity perspective, this aligns with cue-dependent recognition processes, in which accessible cues support brand identification under prompting (Keller, 1993; Yonelinas, 2002).

However, the modest statistical evidence necessitates cautious interpretation. Any association between lyric attention and aided recognition likely depends on contextual factors such as the clarity of brand references, narrative congruence, and the degree to which the integration is perceived as natural rather than intrusive. This is consistent with evidence that integrations tend to perform better when they are perceived as authentic and non-disruptive (Hudders et al., 2012). More broadly, brand awareness outcomes can be shaped by cumulative exposure and prior familiarity beyond the focal stimulus, which may dilute the explanatory contribution of any single cue type in cross-sectional survey settings (Campbell, & Keller, 2003).

Other elements, including visuals, logos, products, and brand-name cues, do not demonstrate statistically significant associations with aided brand recognition in this dataset. This suggests that mechanisms often emphasized in visual-salience accounts may operate differently in music-based digital content and under fragmented attention patterns typical of YouTube use (Beuscart et al., 2022). Taken together, the results point to selective, rather than uniform, associations between specific embedded cues and prompted brand identification outcomes.

Asymmetric associations across dimensions of brand awareness

A key insight from the findings is that associations between BMV elements and brand awareness outcomes are asymmetric across contextual brand retrieval (recall-proxy) and aided brand recognition. No single element shows strong, consistent associations with both outcomes. Instead, attention to slogans is more strongly associated with recall-proxy, whereas attention to lyrics shows only tentative evidence of association with aided recognition. This pattern supports the view that recall and recognition are related but distinct memory processes rather than interchangeable indicators of communication effectiveness (Keller, 1993; Yonelinas, 2002).

In this study, contextual retrieval appears more closely linked to explicit verbal cues such as slogans, which can serve as salient anchors supporting retrieval-oriented brand identification (Briggs, & Janakiraman, 2017; Keller, 1993). Aided recognition, by contrast, may be partially supported by lyrics as an auditory–linguistic context that facilitates prompted brand identification, although the evidence here is weaker (Delattre, & Colovic, 2009; Van Vaerenbergh, 2017). The lack of overlapping predictors suggests that BMVs are unlikely to operate as a one-size-fits-all branding tool; effectiveness is likely to depend on the campaign objective (retrieval-oriented versus recognition-oriented awareness) and on how audiences process music-video content under platform conditions (Rossiter, 2014). For Vietnamese Generation Z audiences, this interpretation is consistent with evidence that YouTube music-video use often involves listening rather than continuous viewing, which may make auditory/verbal layers relatively more influential than purely visual cues (Beuscart et al., 2022).

Finally, the relatively low explanatory power of the regression models indicates that the measured BMV elements explain only a small share of variation in the brand-identification outcomes. This is not unexpected in cross-sectional social research, as brand awareness is shaped by multiple unobserved influences such as prior brand familiarity, cumulative cross-platform exposure, and individual differences in engagement (Calder et al., 2009; Campbell, & Keller, 2003). Moreover, the study’s outcomes are derived from list-based brand-identification tasks without decoy brands, which may introduce guessing and measurement noise and thereby attenuate model fit. Importantly, because the study’s aim is explanatory, estimating selective associations, rather than prediction, modest R^2 values do not preclude theoretically meaningful inference in such settings (Abelson, 1985; Shmueli, 2010). These results should therefore be interpreted as evidence of cue-specific associations rather than comprehensive determinants of brand awareness.

Limitations and directions for future research

This study should be interpreted in light of several limitations. The regression models show relatively modest explanatory power, which is not uncommon in quantitative social science research. Outcomes such as brand awareness are typically shaped by multiple interacting influences, including prior brand familiarity, cumulative media exposure, and individual differences in engagement, that are difficult to fully capture within a single cross-sectional model. Consequently, the results should be interpreted as identifying selective associations rather than providing a comprehensive explanation of brand-

identification outcomes (Abelson, 1985; Shmueli, 2010). In addition, the study relies on self-reported measures of attention and a cross-sectional survey design, which limits the ability to infer causal relationships. The measurement of brand awareness is also based on list-based identification tasks without decoy brands, which may introduce some degree of guessing. Finally, this research represents an exploratory quantitative attempt to estimate how embedded brand cues in branded music videos relate to recall and recognition, an area that remains relatively underexplored in existing literature, particularly in emerging digital markets such as Vietnam. Future research could build on these findings by employing experimental or longitudinal designs and incorporating additional explanatory variables to better capture the complex mechanisms underlying brand awareness in music-based digital advertising contexts.

Conclusion

This study shows that although multiple brand elements are commonly integrated into YouTube branded music videos, their associations with brand awareness are not uniform. In particular, attention to slogans is positively associated with contextual brand retrieval (recall-proxy), whereas attention to lyrics shows only tentative evidence of association with aided brand recognition. Overall, the results suggest that verbal/auditory components may be more closely linked to memory-based brand-identification outcomes in this context than the other measured elements, although the strength of evidence differs across outcomes.

While BMVs combine auditory and visual modalities, the present findings do not support the assumption that visual prominence or brand visibility alone reliably predicts brand awareness outcomes in this sample. Instead, linguistically explicit cues such as slogans appear more closely associated with retrieval-oriented identification, and lyrics may provide a limited channel through which audiences identify brand-related information when prompted. These conclusions should be interpreted as associations rather than causal effects, given the cross-sectional survey design and the modest explanatory power of the regression models.

For marketers in Vietnam, BMVs remain a promising approach to reaching digitally engaged younger audiences, but execution should be aligned with the specific branding objective. If the goal is to support retrieval-oriented awareness, ensuring that slogans are clear and salient within the music-video experience may be particularly important. Future research could strengthen construct validity by adopting a sequential two-step measurement procedure (unaided recall followed by recognition with distractor brands), incorporating

decoy brands to reduce guessing, employing experimental designs to assess causal mechanisms, and accounting for additional drivers of brand awareness such as prior brand familiarity and cross-platform campaign exposure.

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The role of digital literacy in corporate digital communication and SMEs' performance¹

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Abstract

Online communication devices should be used effectively to ensure that small and medium enterprises (SMEs) are able to optimize their operations, create relationship with customers and attain sustainable growth. This paper discusses how corporate digital communication (CDC) influences the performance of SMEs based on technological adoption, the presence of social media, and customer engagement as the determinants of SME performance. The sample population in this study included 73,081 SMEs registered with the Small and Medium Enterprise Development Agency of Nigeria (SMEDAN). The hypotheses were tested and the measurement and structural models were evaluated using Structural Equation Modelling- Analysis of Moment Structures (SEM-AMOS). The results indicate that there are strong positive correlations among

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technological adoption, presence of social media, customer engagement and SME performance. The research also established the fact that digital literacy mediates such associations where low digital literacy undermines the effects of corporate digital communication on SME performance. The research offers a solid empirical data, which supports the assumption that the implementation of digital tools in the absence of investing in digital literacy can prevent the potential benefits on SMEs. Therefore, policymakers and business development agencies are advised to focus more on digital upskilling programs, so that SMEs can be better placed to operate within the digital economy.

Keywords

Digital communication, digital literacy, technological adoption, social media, SME.

Introduction

Digital technology has become an integral part of our lives (Sumskaya, & Solomeina, 2022), and it is equally transforming the level at which businesses are conducted and interacting with potential and actual clients. This is more so the case with small and medium enterprises, or SMEs (Siregar et al., 2023). Businesses have been moving toward the digital form of communication to empower their operations, cater to a wider audience, and retain their clientele (Nirmalasari et al., 2022; Nasidi et al., 2024). Although digital tools can be useful in business, most businesses are not fully aware of their impact on the success of the SMEs. This can be linked to the digital literacy or how well people can utilize online communication and technology. Unless the owner of a single business or even a group is aware of how to effectively use digital tools, it may be a disadvantage in this competitive world. The reality is that digital tools are not magic fixes. It is not all about having the tools but also about understanding how to use them. As the world is moving towards digitization, digital tools are becoming an integral part of our lives, signaling the need to understand technology and digital tools as key to success (Parviainen et al., 2017; Muschert, & Shomotova, 2025).

Digital communication in business is all about using online tools to share information and connect with potential customers (Sashi, 2021). It is essential for building mutual relationships and keeping people engaged. Businesses using the right digital tools can make their work simple. Using digital tools helps companies save money and customers better (Marion, & Fixson, 2021). Social media are relatively cheap, allowing businesses to make their products

visible and to communicate with customers directly (Malesev, & Cherry, 2021). This helps in creating a loyal customer base: people start recognizing the brand and feeling more connected. Digital communication tools make it easier for companies to keep in touch with customers (Ingrassia et al., 2022). Customers' satisfaction and trust grow when they feel involved, leading to brand loyalty.

Digital communication has many benefits, but an important factor is how well SME owners and their employees deal with technology and understand the opportunities those can provide. Digital literacy is paramount to SMEs; when business owners know how to use digital tools effectively, the chances of success are very high. Companies or business owners who fail to use such tools, especially social media, could miss a significant chance to relate to customers and promote their products or services. Also, it is tough for business owners to make the most of technology without digital literacy. This can lead to a weak social media presence and customer engagement. If companies are not engaging with customers, they will not likely benefit from good digital communication. This study investigates how corporate digital communication affects SMEs' performance by examining the interactions among technology adoption, social media presence, and customer engagement, paying attention to the moderating role of digital literacy in this process.

Literature review

Corporate digital communication

Corporate digital communication incorporates the strategic use of digital platforms (Brockhaus et al., 2023) to engage with customers, investors, employees and the general public. Corporate digital communication has become omnipresent with the rise of the internet, social media, and mobile technologies, which have changed how business organizations communicate (Paul et al., 2024). Compared with traditional methods like print or broadcast media, digital communication allows for live interaction, broad reach, borderless communication and personalized messaging (Istijanto, & Purusottama, 2023), nurturing deeper connections with stakeholders. Digital communication allows organizations to disseminate information quickly, immediately respond to feedback and tailor messages or content to specific audiences (Gaysynsky et al., 2022), enhancing engagement and trust. The key approaches to corporate digital communication are integrated communication, which is a certification of consistency in several digital channels, and content marketing, which entails the creation and dissemination of valuable and relevant content to appeal and retain audiences (Capriotti et al., 2021).

Technological adoption and SME performance

Technological adoption involves the incorporation of digital communication tools, platforms, and processes in the business processes to improve efficiency, productivity, and competitiveness. The connection between technological adoption and SME performance has been studied by researchers. It was shown that digital transformation has positive effects on the performance of SMEs by assisting in making the right decisions and engaging with customers. Gamage et al.'s (2020) study has emphasized that SMEs in developing countries have difficulties locating technology that is affordable. Eliyana et al. (2024) argue that technological adaptation is vital in improving SMEs performance. The research indicates that SMEs with digital platform capabilities are achieving better outcomes. Ashiru et al. (2023) revealed that SMEs that adopted digital communication tools during the pandemic were better able to adapt to disruptions and possibly maintain business continuity. Ardito et al. (2021) found that SMEs leveraging digital innovation reported higher environmental and financial performance rates. Fu et al. (2024), highlight that technological adoption, especially social media marketing, improves SME performance. Kurniasari et al. (2023) indicate that technological adoption enhances the performance of SMEs in traditional markets. The study argued that social influence positively impacts SMEs' digital adoption; their performance improves as SMEs embrace digital technologies. Other studies, like Bag et al. (2023), Prasanna et al. (2019), Kumar et al. (2021), Nasrollahi et al. (2021) established the relationship between technological adaptation and SMEs' performance. Therefore, based on the reviewed literature, the following hypothesis is formulated:

H₁: There is a positive relationship between technological adoption and SMEs' performance.

Social media presence and SME performance

Social media is an effective tool of SMEs to increase their visibility, interact with customers, and promote their performance. Studies reveal that the use of social media can possibly improve the performance of SMEs. Platforms such as Facebook³, WhatsApp, X, TikTok and Instagram⁴ can be used to market SME's product and services. According to a study conducted by Al Halbusi et al. (2024) SMEs that actively use the media received more customer attention and brand recognition, which consequently boosts their sales. Social media allows for communication between the organizations and the customers in a direct

³ Belong to Meta company, banned at the territory of the Russian Federation.

⁴ Ibid.

manner which builds stronger relationships. Kamboj and Kishor (2024) proved that SMEs that communicate with their customers via social media have an advantage of increased customer satisfaction. Ainin et al. (2015) found out that SMEs that were regular in their use of social media experienced higher growth in profits as compared to those that had no or minimal presence in social media. The social media proved to be effective when SMEs were faced with crisis such as the COVID-19 pandemic. A study by Eggers et al. (2017) emphasized that SMEs that communicated with their clients via social media in the face of the pandemic had an advantage to sustain trust and continuing business. Thus, based on the reviewed literature, the following hypothesis is formulated:

H₂: There is a positive relationship between social media presence and SMEs' performance.

Customer engagement and SME performance

Customer loyalty, contentment, and overall business success may all be greatly impacted by a company's interactions and connections with its customers, which are referred to as customer engagement. Since it may lead to competitive advantage, word-of-mouth recommendations, and repeat business, cultivating great customer interaction is especially important for SMEs. Engaging customers are more likely to remain loyal to products or services and possibly repeat purchases. Iyelolu et al. (2024) revealed that SMEs with high customer engagement reported improved customer retention rates. Social media, websites, and mobile applications are examples of digital platforms that have become vital tools for SMEs to interact with their customers. Hollebeek et al. (2022) confirmed that SMEs using digital channels for customer engagement experienced higher customer satisfaction and brand advocacy levels. Kedi et al. (2024) emphasized that SMEs that participated in personalized marketing and customer service saw significant improvements in customer satisfaction and overall performance. Engaged customers are more likely to recommend a business to others, which is likely to lead to organic growth. Iyelolu et al. (2024) found that SMEs with strong customer engagement strategies benefited from increased word-of-mouth referrals and positive online reviews. Thus, based on the reviewed literature, the following hypothesis is formulated:

H₃: There is a positive relationship between customer engagement and SMEs' performance.

Moderating role of digital literacy

In this study, digital literacy refers to the knowledge and skill levels of SME owners, managers, or key staff responsible for digital communication

and decision-making within the enterprise. These actors are crucial in determining how technology is adopted, how social media is managed, and how customer engagement strategies are implemented. The capacity to utilize digital technologies critically and effectively is known as digital literacy, and it is essential to how SMEs use technology, interact with clients, use social media, and succeed in the end. Digital literacy is a crucial moderating element that affects the effectiveness of these programs as SMEs depend more and more on digital tools and platforms. Digital literacy improves the association between technology adoption, social media presence, customer interaction, and SME success. Zahoor et al. (2023) found that digital literacy moderates the relationship between technology adoption and SME performance. In this vein, digitally literate SMEs more effectively utilized advanced communication tools.

SMEs with high digital literacy levels are more likely to create impactful social media campaigns and analyze engagement metrics. Digital literacy enhances the ability of SMEs to use customer data effectively, tailor communications, and build stronger relationships, leading to improved customer satisfaction and loyalty (Dairobi, & Anisah, 2024). Digital literacy acts as a substance for improving SME performance by enabling effective use of technology, social media, and customer engagement strategies. Thus, based on the reviewed literature, the following hypotheses were formulated:

H_{4a}: The digital literacy of SME owners positively moderates the relationship between technological adoption and SME performance.

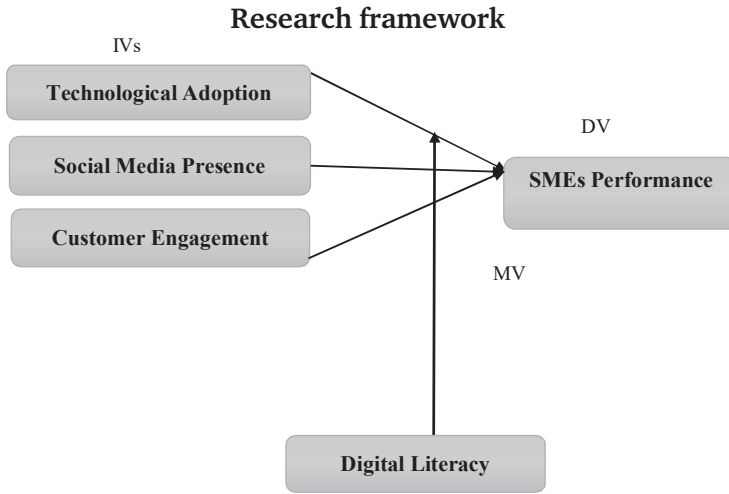
H_{4b}: The digital literacy of SME owners positively moderates the relationship between social media presence and SME performance.

H_{4c}: The digital literacy of SME owners positively moderates the relationship between customer engagement and SME performance.

Research framework

The relationship between independent variables (IVs), dependent variable (DV), and moderating variables (MV) are depicted in the research framework for this study (see *Figure 1*). The framework is intended to investigate how corporate digital communication affects the performance of SMEs and the moderating role of digital literacy.

Figure 1



Methodology

This study adopted a quantitative survey, and a questionnaire was used for data collection. The target population for this study consist of 73,081 SMEs registered with the Small and Medium Enterprise Development Agency of Nigeria (SMEDAN). A simple random sampling (SRS) technique was used to ensure equal representation and reduce selection bias among SMEs across different industries. The study used Krejcie and Morgan's (1970) sample size table, which is widely used in management and social sciences research. Based on the table formula, a population of 73,081 requires 382. To accommodate non-response and errors, the sample size was increased to 400. The survey achieved a response rate of 78%, resulting in 312 valid responses used for analysis. The questionnaire was adapted from previous studies to suit this study. The data were analyzed using SEM-AMOS to examine Confirmatory Factor Analysis (CFA) and Structural Model testing. SEM is preferred in management and social science research because it can simultaneously model complex relationships between multiple constructs and test hypotheses (Awan, 2022). This study assessed multiple latent constructs, i.e. technological adoption, social media presence, customer engagement, and SME performance, and their interrelationships concurrently. Additionally, we examined the moderating role of digital literacy. SEM-AMOS allowed for the simultaneous evaluation of measurement and structural models, ensured construct validity and reliability, and enabled a clearer understanding of the total and indirect effects. Although

simpler statistical methods (e.g., multiple regression) could examine isolated paths, they would not sufficiently capture the complexity of the integrated model or test moderation using multi-group analysis as efficiently.

Reliability and validity test

The reliability and validity test results, as presented in *Table 1*, assess the reliability, convergent validity, and discriminant validity of the constructs in the measurement model. Construct reliability (CR) values indicate strong internal consistency, with all constructs exceeding the recommended threshold of 0.70 (Hair et al., 2010). The average variance extracted (AVE) values further confirm convergent validity, as all constructs exceed the minimum threshold of 0.50 (Hair et al., 2006, 2011). SME performance (0.561), technology adoption (0.592), social media presence (0.543), and customer engagement (0.509) indicate that their respective latent constructs explain the majority of variance in the observed indicators. Discriminant validity is assessed, which requires the square root of each construct's AVE to be greater than its correlations with other constructs. The square roots of AVE for SME performance (0.749), technology adoption (0.770), social media presence (0.737), and customer engagement (0.713) exceed their corresponding inter-construct correlations. This confirms that each construct is distinct from the others, demonstrating that the model measures separate but related dimensions.

Table 1

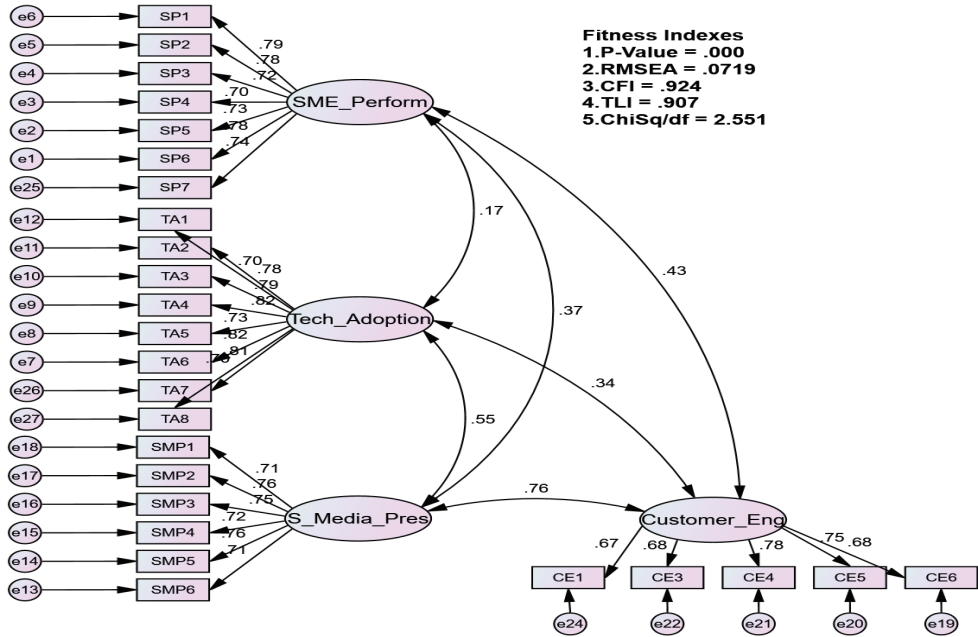
Validity test						
	CR	AVE	SP	TA	SP	CE
SME_Performance	0.899	0.561	0.749			
Tech_Adoption	0.921	0.592	0.172	0.770		
S_Media_Pres	0.877	0.543	0.374	0.548	0.737	
Customer_Eng	0.838	0.509	0.431	0.345	0.622	0.713

Results

Figure 2 represents a Pooled Confirmatory Factor Analysis (CFA) model, which integrates multiple latent constructs within a single measurement framework to assess their validity and reliability. This approach is commonly used to confirm the measurement structure of the theoretical model by assessing factor loadings, model fit indices, and the relationships between constructs. Each latent construct in the model is represented as an oval, while its observed variables are depicted as rectangles.

Figure 2

Pooled CFA



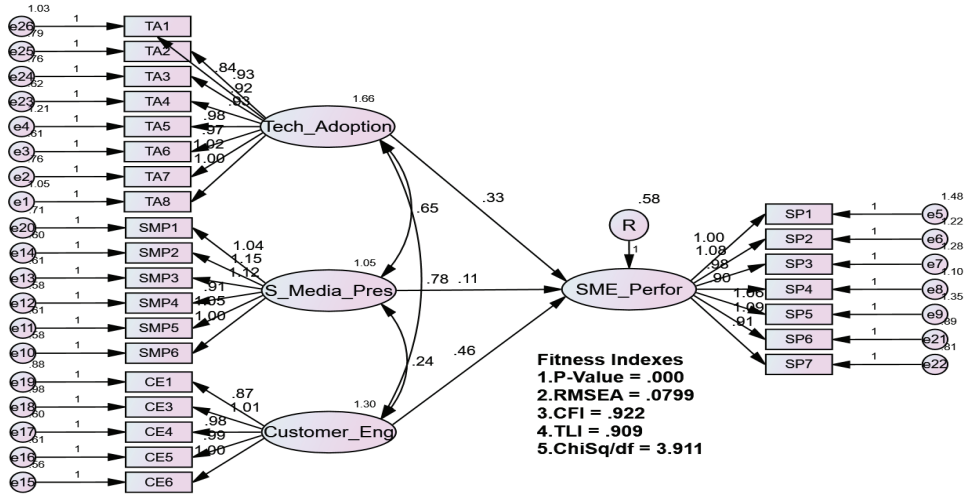
Structural model analysis

This structural equation model (SEM) represents the relationships between multiple latent variables, including technology adoption (TA), social media presence (SMP), customer engagement (CE), and SME performance (SP). The diagram shows factor loadings, path coefficients, and model fitness indexes. Multiple observed variables measure each latent variable. Technology adoption is indicated by TA1 to TA8, social media presence by SMP1 to SMP6, customer engagement by CE1 to CE6, and SME performance by SP1 to SP7. The factor loadings, represented by values on the arrows from the latent variables to their indicators, suggest strong relationships, with most values exceeding 0.80, indicating a good measurement model as recommended by Cheung et al. (2024).

The structural paths prove the relationships among the latent constructs. Technology adoption has a direct effect on SME performance (0.33) and an indirect influence through social media presence (0.65) and customer engagement (0.24). Social media presence substantially directly affects SMEs' performance (0.78), while customer engagement has a moderate effect (0.46). These coefficients suggest that social media presence is the strongest predictor of SME performance among the three independent variables (see Figure 3).

Figure 3

Unstandardized SEM



The model fitness indexes suggest an acceptable model fit. The p-value is .000, which indicates statistical significance. The RMSEA value of 0.0799 is within the acceptable range, suggesting a reasonably close fit. The CFI is 0.922, above the 0.90 threshold, demonstrating a good fit. The TLI is 0.909, further supporting the model's adequacy. Lastly, the Chi-square/df ratio of 3.911 indicates a moderate model fit.

Hypotheses testing

The regression weights for each path analysis reported in the research hypotheses for the study are shown in Table 2. The path coefficient from technology adoption (TA) to SME performance is 0.330, with a standard error (S.E.) of 0.049 and a critical ratio (C.R.) of 6.735. The P-value ($p < 0.001$) indicates a highly significant relationship, suggesting that technology adoption has a moderate but positive effect on SME performance. Equally, social media presence (SMP) shows a statistically significant impact on SME Performance, with a path coefficient of 0.110, S.E. of 0.026, and a C.R. of 4.231 ($p = 0.05$). While social media presence contributes to SME performance, its effect size is relatively minor compared to other predictors. However, customer engagement (CE) emerges as the strongest predictor of SME performance, with a path coefficient of 0.457, S.E. of 0.055, and a C.R. of 8.319 ($p < 0.001$). This highly significant relationship underscores the importance of customer engagement in driving business success.

Table 2

Path coefficients

Path	Estimate	S.E.	C.R.	P
SME_Performance ← Tech_Adoption	.330	0.049	6.735	***
SME_Performance ← Social_Media_Presence	.110	0.026	4.231	***
SME_Performance ← Customer_Engagement	.457	0.055	8.319	***

Moderation analysis

This research uses digital literacy (DL) as a categorical variable. A multi-group analysis was conducted to test the moderating effect and compare the study model. The data set for testing the moderating effect of digital literacy was divided into two: low digital literacy (group 1) and high digital literacy (group 2). Each category was constrained by a parameter (1), while the constrained and unconstrained model result was compared. If the difference in Chi-Square value between the constrained and unconstrained is greater than 3.84, the path is moderated (Awang, 2015). However, for moderation to exist, the difference in the Chi-Square degree of freedom (DF) must be 1 (Saeed et al., 2024).

The moderation analysis for high digital literacy in *Table 3* was significant across all three relationships. For the first hypothesis (TA → SME), the chi-square value for the constrained model is 1870.582 with 587 degrees of freedom, while the unconstrained model shows a chi-square value of 1865.703 with 586 degrees of freedom. The chi-square difference is 4.879 with a difference of 1 degree of freedom. Since this significant change indicates that digital literacy moderates the relationship between TA and SME. The hypothesis is supported. The second hypothesis (SMP → SME) has a larger difference, having the change of chi-square of 35.22 and the difference of 1 degrees of freedom. This is a notable moderating influence that indicates that high digital literacy is a highly influential determinant of the strength of the relationship between SMP and SME, which is in support of the hypothesis. In the same way, the difference in the chi-square in the third hypothesis (CE SME) is 32.887, again with a 1 degree of freedom, with this difference being significant. This finding proves the hypothesis formulated as in the presence of high digital literacy, there is a moderating influence between the relationships between CE and SME.

Table 3

Moderation test for high digital literacy group data

Hypotheses	Chi-Square (Constrained model)	DF	Chi-Square (Unconstrained model)	DF	Difference in Chi-Square	Difference in DF	Result on moderation	Result on hypotheses
TA -- > SME	1870.582	587	1865.703	586	4.879	1	Significant	Supported
SMP -- > SME	1900.923	587	1865.703	586	35.22	1	Significant	Supported
CE -- > SME	1898.590	587	1865.703	586	32.887	1	Significant	Supported

The result of the moderation regarding the low digital literacy group is provided in Table 4, and it indicates a different trend. In the first hypothesis (TA – SME), the chi-square difference is only 0.057 with a difference of 1 degree of freedom which is insignificant, that means that digital literacy does not moderate this relationship. In this way, the hypothesis is not confirmed. In the case of the second hypothesis (SMP→SME), the difference in chi-square is 0.525, and the degree of freedom is 1, which is not significant either. The results of this finding imply that the association between SMP and SME is not affected in the high digital literacy setting, hence the hypothesis was not proven. However, the third hypothesis (CE →SME) has a significant chi-square difference of 5.787 at 1 degree of freedom. Such a drastic moderation effect implies that even in individuals who are not highly digitally literate, CE still has a strong impact on SMEs, which supports the hypothesis developed.

Table 4

Moderation test for low digital literacy group data

Hypotheses	Chi-Square (Constrained model)	DF	Chi-Square (Unconstrained model)	DF	Difference in Chi-Square	Difference in DF	Result on moderation	Result on hypotheses
TA -- > SME	1898.647	588	1898.590	587	0.057	1	Insignificant	Not Supported
SMP -- > SME	1899.115	588	1898.590	587	0.525	1	Insignificant	Not Supported
CE -- > SME	1904.377	588	1898.590	587	5.787	1	Significant	Supported

Conclusion

The paper concludes that corporate digital communication improves the performance of SMEs. One of the pillars is technological adoption which helps SMEs to make operations easier, efficient and competitive in an ever-digitalizing marketplace. Secondly, the research sheds light on the significance of having a strong social media profile, which supports the presence of the brand in the market, communication with customers, and reaching the broader market. By means of well-planned content marketing, the timely customer service, the campaigns premised on engagement, SMEs can create better relations with the audience, which instills trust and loyalty. Thirdly, the importance of customer engagement as a major driver of performance improvement is mentioned. By utilizing digital communication tools, such as customized email marketing, interactive websites, and responsive social media messages, the SMEs can develop a more personalized and pleasing customer experience. One of the most important results of the study is the moderating role of digital literacy. The study demonstrates that companies where digital competencies are more robust tend to optimize the advantages of these communication strategies. By investing in the development of digital skills in their employees, SMEs can better leverage new technologies, evolve in line with emerging digital trends, and adopt new marketing strategies. Consequently, these digitally literate enterprises are faster, more resilient, and capable of achieving long-term growth.

Lastly, the paper adds to the existing literature on SME digital transformation by providing empirical evidence on the impact of corporate-level digital communication plans that are moderated by digital literacy on SME performance in a developing country setting. Moreover, the paper fills in a gap in non-Western academic literature by analyzing Nigerian SMEs, presenting new information in underrepresented areas in the study of global digitalization.

Limitations

The limitation of this study could be the fact that it uses more complex statistical modelling models like SEM-AMOS, which may be too complex with the hypotheses being tested. Whereas, we think that SSM was justified in this case due to the latent variables, moderation analysis, and the combined character of the model, the future research can be able to reproduce these results through simpler statistical models to make them more accessible and comparable. In addition, the cross-sectional design does not allow us to determine the relationship between variables. The research on the pre-registration of SMEs only in Nigeria by SMEDAN, can be a limitation of the generalization of the

results to other areas or unregistered SMEs. Once more, there can be social desirability bias when using self-reported questionnaires. Nonetheless, these drawbacks are alleviated by methodological rigueur, which comprises random sampling, high response rate, and verified measuring tools. These limitations do not play a big role in undermining the validity of the main findings, which are in line with the theoretical expectations and the empirical literature.

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