

AI Generative Chatbot in the Media: Journalistic Coverage of ChatGPT in Bosnia and Herzegovina

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Abstract

In diffusion research, journalistic coverage is acknowledged as a significant factor in spreading awareness and fostering knowledge about innovation, potentially accelerating or impeding the adoption process. With regards to AI-related innovations, this dynamic has largely been studied within the context of Western developed countries. There is far less understanding of how this process unfolds in the news ecosystem of post-communist countries, particularly those with lower democratic standards and weaker economic development, such as Bosnia and Herzegovina. With the intention of gaining preliminary insights, this study investigated how the journalistic organizations in Bosnia and Herzegovina covered the emergence and societal adoption of ChatGPT, a novel form of generative AI, during the initial six-month period following its widespread availability. The content analysis of relevant news messages (N=542) published by 40 legacy and digital-only news outlets was used to explore the key characteristics of journalistic coverage, the attention given to the issue over time and the media depictions of this innovative AI technology. Results indicate that a small group of news outlets, predominantly legacy news organizations, provided significantly more content on ChatGPT than others, particularly public broadcasting services. Findings highlight a tendency among news outlets to focus on either the risks or benefits of ChatGPT and similar AI-based products and amplify sources associated with the business sector and high-tech industry, overrepresented by male voices.

Keywords: journalism, artificial intelligence, ChatGPT, diffusion of innovations, content analysis.

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Introduction

With the increased application in numerous societal sectors, artificial intelligence (AI) technology has become a prominent issue in public discussion in

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many nations over the world (Brause, Zeng, Schäfer & Katzenbuch, 2023). Lately, there has been a growing interest in the area of machine learning language models, especially after the launch of AI-powered chatbot ChatGPT in November last year, and similar competing products developed by other big tech-companies, like Bard (Google), Ernie Bot (Baidu), or LLaMA (Meta). According to the analytics firm Similarweb (Carr, 2023), the number of ChatGPT users grew from 100 million in January 2023 to 180.5 million by August 2023.

Dissemination research (Currall, King, Lane, Madera & Turner, 2006; Strelakova, 2015) suggests that social support and acceptance of emerging, unfamiliar, and quite often controversial innovative technologies, such as AI-based chatbots, depends on the public understanding of its benefits and risks. Also, previous studies (Chuan, Tsai & Cho, 2019; Goodman & Goodman, 2008) have shown that public perceptions of new scientific advances are often informed and shaped by the information, viewpoints, narratives, and voices presented in news media. Therefore, research studies assessing how information about AI related products are presented through mass communications channels are important to understand factors influencing public debate about these rapidly developing technologies.

While there is a growing body of academic research on media coverage of AI technology in Western democracies, less attention has been given to the news ecosystem of post-communist countries, particularly those with the lower democratic standards and weak economic developments, designated in comparative studies as ‘the media in transitional model’ (Dobek-Ostrowska, 2015), such as Bosnia and Herzegovina, Montenegro, or North Macedonia. These countries are characterized by underdeveloped innovative tech ecosystems, brain drains, political and economic instability, instrumentalization of the media by political and business elites, and limited journalistic autonomy (Turčilo & Buljubašić, 2017).

According to diffusion theory (Rogers, 2003), it is crucial to examine how the social context, including news coverage, not only facilitates but also constrains the adoption and application of transformative technologies across various societal domains. To the best of our knowledge, no prior work has explored those issues in the context of the media landscape of Bosnia and Herzegovina. With the intention of gaining preliminary insights and encouraging further research, the case of ChatGPT was chosen to examine how journalistic organizations in Bosnia and Herzegovina covered the emergence, promotion, and practices of using this innovative AI technology among early adopters during the initial six months following its widespread availability on November 30, 2022.

The first, introductory part of the paper is followed by five sections. In the second and third section, a short review of literature, the theoretical approach and research questions that guide the analysis are presented. The methodological framework of the paper is elaborated in the fourth section. The fifth section of the paper elaborates on the results of the content analysis of news articles. Finally, a discussion of the results, main conclusions, remarks on the limitations of the paper as well as recommendations for future research are presented in the sixth section.

Literature review

The latest review of the current state of research on news media coverage of AI indicate that majority of existing studies focuses strongly on Western developed countries, mostly the United States and United Kingdom, showing a strong increase in the amount of media attention for AI over time, dominance of economic and business perspective and largely positive evaluations (Brause, Zeng, Schäfer & Katzenbuch, 2023: 277).

Nguyen and Hekman's (2022) study of a 10-year coverage of AI by four internationally renowned media outlets – *The New York Times*, *The Guardian*, *Wired*, and *Gizmodo* – identified several themes that the outlets choose to emphasize with respect to four broad perspectives: economic prospects (labeled by authors as 'AI & Economics meta-frames'), political challenges ('AI & Politics meta-frames'), scientific progress ('AI & Research/Science meta-frames'), and concerns about human-machine relationships ('AI in Society/Culture meta-frames'). The news discourse associated these dominant frames with the four most prevalent data risks: data bias and algorithmic discrimination, surveillance and privacy intrusion, cybercrime and cyberwarfare, and types of risks related to information disorder, including 'fake news', 'deep fakes', and hate speech. Results of the analysis also point to the benefits emphasized in AI news reporting, such as increased efficiency and productivity, better management of resources and processes, and the improvement of human abilities in fostering knowledge and creativity.

Findings from another study (Chuan, Tsai & Cho, 2019) revealed that topics related to business and economy and technology development and application were the most prevalent subjects in news coverage of AI in five most widely-read American newspapers: *USA Today*, *The New York Times*, *Los Angeles Times*, *New York Post*, and *Washington Post*, from 2009 to 2018. News articles discussed the benefits of AI more frequently than its risks. Economic benefits, improvement of well-being and the reduction of human biases or inequality were the most frequently discussed types of benefits in media discourse, while concerns associated with shortcomings of the technology, loss of jobs and privacy intrusion were among most mentioned types of risks. Analysis of *New York Time's* 30-year coverage of AI (Fast & Horvitz, 2017) also showed overwhelmingly positive assessments of technology.

The Reuters Institute for the Study of Journalism's (Brennen, Howard & Nielsen, 2018) analysis of eight months of reporting on AI in six mainstream news outlets in the United Kingdom – *The Telegraph*, *Daily Mail*, *The Guardian*, *HuffPost*, *BBC*, and the UK edition of *Wired* – reveals a growing politicization in the way this technology is covered by journalists. The research uncovered how right-leaning outlets emphasize issues of economics, business, national security and geopolitics, topics long prioritized by the Conservative party. Likewise, left-leaning outlets highlight questions of ethics, discrimination, and privacy, "reading AI through long standing concerns over labour relations and social justice" (p. 9).

Evidence from similar research studies conducted in other developed Western countries, such as Vergeer's (2020) study of reporting on AI in Dutch newspapers,

also indicate that salience for AI-related topics increased over time in media discourse. However, different types of newspapers also showed a distinct coverage of these issues. Compared to regional, national newspapers published more articles about AI topics but were also more negative about AI. Newspapers with economic orientation and religious newspapers were more favorable to AI as compared to popular newspapers.

Overall, further research is needed to understand not only similarities and differences in coverage of AI between different types of news organizations but also between different journalistic cultures around the world.

Given the novelty of the subject, it is understandable why scholars are only just beginning to analyze the way news media are covering ChatGPT and similar tools associated with generative AI. ChatGPT (which stands for ‘Chat Generative Pre-Trained Transformer’) is a large language model (LLM) chatbot designed by OpenAI, an American tech company, to “provide human-like response to user prompts based on the supervised and reinforcement learning technique that involved extensive digital training data as well as human feedback and response evaluations” (Schäfer, 2023: 2). Although a question of media representations of ChatGPT is receiving attention, most of the existing research works are limited to specific concerns, like the role of news discourse in shaping dominant social imaginaries of ChatGPT in educational context (Kikerpill & Sibak, 2023), prevalent metaphors used in online press reports to frame ChatGPT (Figar, 2023), or the way transparency principle of generative AI and similar regulatory initiatives are discussed in public discourses (Masotina, Musi & Spagnolli 2023).

Karanouh’s (2023) study of a corpus of 10,902 news headlines related to the OpenAI chatbot collected from Western media sources from its launch in November 2022 to March 2023 revealed early trends and sentiments toward ChatGPT. The findings of sentiment analysis indicate that ChatGPT was perceived more positively than negatively in the mainstream media, while automated content analysis highlights predominance of issues and actors associated with the Big Tech industry. Coverage of ChatGPT started to gain a significantly high level of attention among Western online news outlets and broadcast, businesses and cable news stations in January and February of 2023, according to the study conducted by the Tows center for digital journalism (Bartholomew & Mehta, 2023), using data from Media Cloud and GDELT Project’s databases. As indicated by the research, this was around the time when BuzzFeed unveiled its intention to employ ChatGPT in content creation, Google announced Bard AI as a rival to ChatGPT, and Microsoft integrated ChatGPT into its Bing search engine.

Theoretical framework

While the news coverage of ChatGPT is still a relatively unexplored area of media studies, analysis of innovation diffusion, including the influence of the news ecosystem, is not a novel subject of research in social sciences. The diffusion of innovations theory (Rogers, 2003) offers an elaborate conceptual framework for studying nature, main elements and major sources of influence shaping this dynamic,

with the emphasis on the role of communications in this process. Rogers (2003) defines diffusion as a special type of communicative process “in which an innovation is communicated through certain channels over time among the members of a social system” (5). Within the framework of diffusion theory, the four main elements of diffusion processes are (1) the innovation, a new idea, practice, or object; (2) the communication channels, the means by which information about innovations reach individuals or organizations as units of adoption; (3) time, the period encompassing the adoption process; and (4) social system, the diverse communication networks that units of adoption are part of.

According to Rogers (2003: 36), mass communication channels are the most effective means for spreading awareness and in creating knowledge of innovations, whereas interpersonal channels are more effective in forming, reinforcing or changing attitudes toward innovations.

With respect to the former, scholars (Chuan, Tsai & Cho, 2019; Nguyen & Hekman, 2022; Rogers & Seidels, 2001; Rogers et al, 1993; Strekalova, 2015) are concerned with at least two ways mass communications, particularly news media, can contribute to the dissemination of information and knowledge about innovations, such as generative AI. First, news outlets can force or neglect attention to certain issues, influencing what the public thinks about innovations. This concern relates to the agenda-setting effects (Dearing & Rogers, 1996; McCombs & Shaw, 1972), presumed relationship between the ranking and visibility of issues by news media and its salience in public discourse. Secondly, when covering an emerging technology, news outlets can choose to highlight or ignore certain aspects of the issue, evaluate it as a threat or an opportunity, determine which sources will be granted space to discuss and narrate the issues, and decide which voices will be marginalized or absent. In other words, they can shape how the public thinks about innovations. This concern relates to the framing effects (Entman, 1993; Scheufele, 1999): how the way information about innovation is presented can influence the audience’s perceptions and decisions regarding its adoption.

Although the emergence of new digital platforms and changing media consumption habits has fundamentally transformed the ecology of news provision (Picard, 2014), researchers (Aleksić & Stamenković, 2019; Brennen, Howard & Nielsen, 2018; Nguyen & Hekman, 2022; Swart & Broersma 2017) argue that news outlets still remain a relevant space for, and exert influence on, public discussion of important societal issues, for instance AI. However, this assertion is mostly based, as indicated in the previous sections, on the studies of the news ecosystem of Western developed countries. In the context of AI technology diffusion, much less is known concerning the impact of the media system in post-communist countries, specifically those categorized under the ‘media in transition model’ (Dobek-Ostrowska, 2016), like Albania, Bosnia and Herzegovina, Montenegro, and North Macedonia.

This study aims to address this gap in the AI news diffusion literature. We focus our research on the news media (*communication channels*) coverage of AI-powered chatbot ChatGPT (*innovation*) by the journalistic organizations in Bosnia and Herzegovina (*social system*) during the initial six-month period following its widespread availability

(*time*). Our objective is to explore the key characteristics of news media coverage, the attention given to the issue over time and the media depictions of this innovative AI technology, as it is discussed in the literature as a significant factor with the potential to accelerate, slow down, or impede the adoption of innovations.

Relying on the conceptual framework described above, the paper attempts to analyze the reporting practices of Bosnia and Herzegovina's news outlets about the ChatGPT guided by the following research questions: (1) when did the news outlets start to cover topics related to ChatGPT and how did the coverage evolve over time (*distribution of media attention over time*); (2) what importance were attached to news articles associated with ChatGPT in terms of their size, position and types (*formatting of media messages*); (3) which core issues were emphasized by news coverage of ChatGPT (*themes*); (4) whether and how news articles discuss threats and opportunities of ChatGPT (*references to risks and benefits*) and (5) which sources and how often were granted a space to discuss the issues (*distribution of voices*)?

Methodological framework

In order to provide answers to the questions raised, we conducted the content analysis of messages published by 40 news outlets, both legacy and web-only journalistic organizations from Bosnia and Herzegovina in the period between November 30, 2022 and May 30, 2023. As this paper represents an exploratory study aimed at gaining preliminary insight, which would serve as a basis for further, more complex analysis, data were obtained only from online editions of news outlets.

Media landscape of Bosnia and Herzegovina is highly fragmented. Currently, there are eight daily newspapers published in Bosnia and Herzegovina (Press Council in Bosnia and Herzegovina, 2023), 41 terrestrial television stations, 154 terrestrial radio stations and 63 cable operators (Communications Regulatory Agency, 2023). Latest available research (Osmančević, 2021) has identified 464 news websites, out of which more than 50% lack any information about the publisher and editors behind the web portals. Majority of the messages published by these websites consist of replicated content, originally produced by the minority of established news outlets and news agencies (Baraković & Mahmutović, 2014). Similarly, a small number of broadcasters and cable operators are investing in news programming (Dautović, 2022), with only two channels – Al Jazeera Balkans and N1 – having an all-news format. Given the lack of regular monitoring of media performance, the absence of reliable data on advertising revenue and the absence of data of news consumption patterns (Brunwasser, Turčilo & Marko, 2016), it is difficult to determine a representative sample of news outlets in terms of their popularity, political leaning, ownership, and other similar parameters. For the purpose of the preliminary analysis, we thus selected a sample of 40 news outlets, according to their sector of operation, location, and perceived influence to reflect complexity of the news ecosystem of Bosnia and Herzegovina (see Appendix).

The relevant messages were identified using a specific set of keywords as content indicators, a technique known in digital methodologies as term resonance

analysis (Rogers, 2019). To conduct term resonance analysis a web scraping tool and advanced search engine features were employed. We utilized the Lippmannian Device, a tool developed by the Digital Method Initiative, as a web scraper and Google search engine’s advanced features to perform a customized search of content within a website. An established protocol was followed in the process of selecting relevant news content, incorporating three activities: defining keywords, removing duplicates, and checking the relevance of extracted content. The following keywords were used to identify relevant messages: “ChatGPT” OR “Chat GPT” OR “ČetGPT” OR “ЧатГПТ”. Only journalistic works were included, while content mentioning the keyword published in the website’s forum or comment section was excluded.

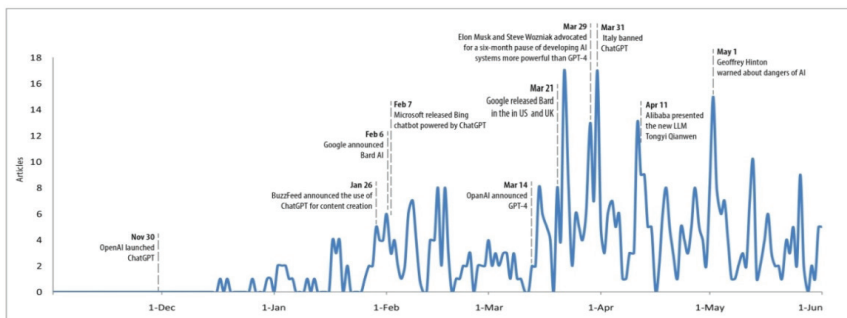
The unit of analysis was a news article. The messages were coded for a range of data, including news outlet, date, length, section, story types, themes, references to risks and benefits, and sources, including gender.

Two trained coders conduct the coding process. The average score of the coder reliability test was .83, and it was performed in the preparatory phase on a sample that made up 20% of the total number of relevant articles.

Results

Using the procedure described above, we identified a total of 542 relevant news articles, published during the observed period. As indicated in Figure 1, the first observed article mentioning ChatGPT was published on December 17, 2022, by N1, a 24-hour cable news channel and CNN International’s local broadcast partner and affiliate. This was more than two weeks after OpenAI released ChatGPT on November 30, 2022. The highest peaks were observed on March 29 when Italy banned ChatGPT over privacy concerns, and on March 22 when news outlets covered stories related to Bard, a new AI-powered chatbot released by Google the day before, Bill Gates’ predictions on the future of humanity, and the replacement of journalistic work by AI-generated content.

Figure 1
News coverage of ChatGPT across six-month period

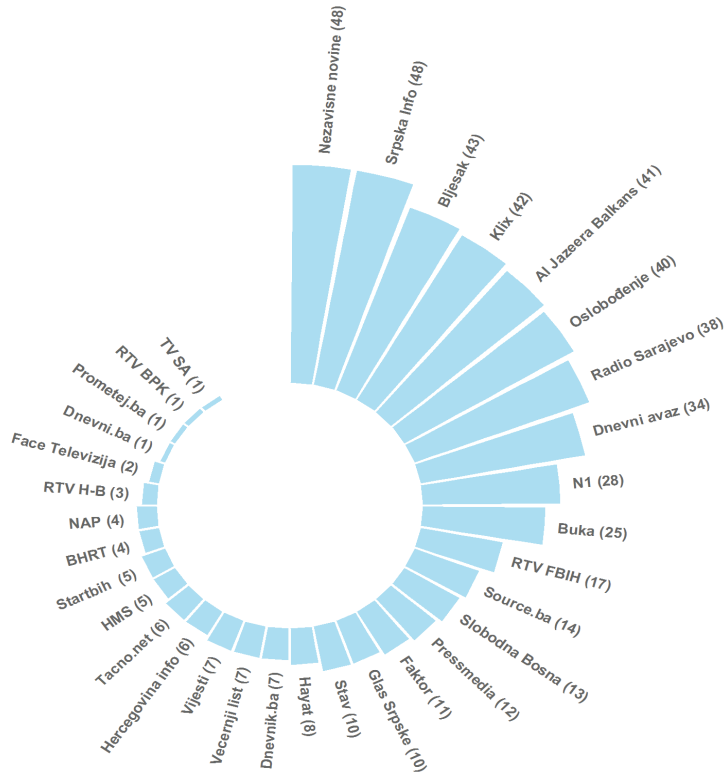


On a monthly basis, the coverage increased over the course of six months in terms of the cumulative number of news articles, reaching its highest share in March 2023 (Table 1).

Table 1
Monthly distribution of news items mentioning ChatGPT

| Months | Cumulative numbers of news items (%) |
|----------|--------------------------------------|
| December | 5 (0.92%) |
| January | 41 (7.56%) |
| February | 80 (14.76%) |
| March | 147 (27.12%) |
| April | 142 (26.20%) |
| May | 127 (23.43%) |
| Total | 542 (100%) |

Figure 2
News outlets: cumulative number of news items mentioning ChatGPT



Among the analyzed sample of news outlets, we observed variations in the amount of coverage dedicated to ChatGPT (Figure 2). Within the first ten news outlets that produced more than 70% of all identified articles are mostly legacy journalistic organizations, including four daily newspapers (Nezavisne novine, EuroBlic³, Oslobođenje, and Dnevni avaz), two regional television stations (Al Jazeera Balkans and N1), and one radio station (Radio Sarajevo), as well as three popular digital-only news outlets (Bljesak, Klix, and Buka). The small number of relevant messages published by the national public broadcaster, Radio and Television of Bosnia and Herzegovina (Bosanskohercegovačka radiotelevizija, BHRT), is indicative. It is important to note that no relevant news items were found in the content of seven news outlets. These outlets include Radio Television of Republika Srpska (Radio Televizija Republike Srpske, RTRS), one of the three public broadcasters in Bosnia and Herzegovina, two cantonal broadcasters (Radio Television of Tuzla Canton and Radio Television of Una-Sana Canton), one commercial broadcaster (RTV BN), and three influential investigative digital outlets (InfoRadar, Zurnal, and Istraga).

Table 2

Length of news articles: first ten news outlets by number of items

| News outlets | Mean (x) | Median (Md) | SD |
|--------------------|----------|-------------|------|
| Nezavisne novine | 1.01 | 0.90 | 0.43 |
| Srpska info | 1.22 | 1.01 | 0.79 |
| Bljesak | 1.41 | 1.26 | 0.68 |
| Klix | 1.35 | 1.17 | 0.94 |
| Al Jazeera Balkans | 2.39 | 1.40 | 2.27 |
| Oslobođenje | 1.86 | 1.48 | 1.28 |
| Radio Sarajevo | 1.61 | 1.08 | 1.10 |
| Dnevni avaz | 1.70 | 1.04 | 3.08 |
| N1 | 1.58 | 1.12 | 0.99 |
| Buka | 2.83 | 1.89 | 2.88 |

The total number of characters in a text was measured to analyze the length of relevant news messages. For convenience, it was expressed using the unit of one ‘card’ (1800 characters with spaces), which is a conventional unit of text length in BH journalistic culture. Analysis indicates a large variance in the length of news items mentioning ChatGPT, with an average value close to two cards ($x=1.73$, $Md=1.19$, $SD=1.6$). Similar characteristics could be observed for the most of the news outlets with the highest number of relevant messages (Table 2).

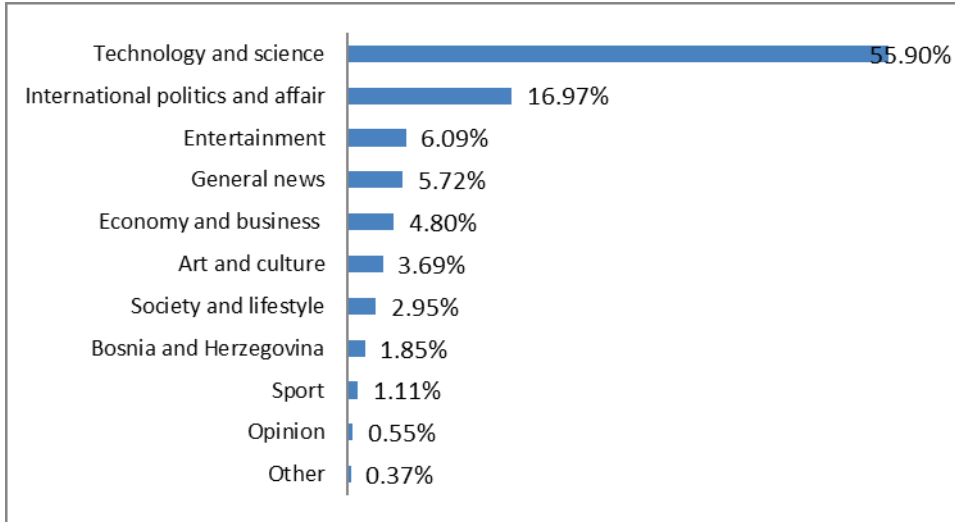
More than half of all identified news items mentioning ChatGPT were positioned in the section dedicated to topics related to technologies and sciences (Figure 3). International politics and affairs were the second section of news content where ChatGPT was most discussed, followed by entertainment sections. For the

³ The website Srpskainfo belongs to the local edition for Republika Srpska of the daily tabloid newspaper EuroBlic, which is owned by Ringier Axel Springer Media AG.

purpose of gaining preliminary insights, the type of news items and authorship were also considered. Hard news was the most represented type of story (N=386, 71.21%), while soft news (N=145, 26.75%) and opinions, editorial, and commentary (N=11, 2.02%) were less common. The bylines of nearly half of all analyzed news articles (N=257, 47.41%) contained references to other news outlets or wire services, either domestic or foreign, as the original authors of information presented in the messages.

Figure 3

Distribution of messages mentioning ChatGPT across news sections



We incorporated the key themes identified in previous research (Nguyen & Hekman, 2022; Chuan, Tsai & Cho, 2019) to code core issues in media coverage of ChatGPT. News reports covering the economic pros and cons of ChatGPT, its potential for various business sectors and economic growth, customer products, services related to ChatGPT and other AI technologies, labor automation, new business deals, or plans announced by key figures in tech companies, and similar topics in *Business and Economy* (N=215, 39.67%) were among the most frequently mentioned issues. Articles addressing the political implications of ChatGPT and similar A.I. technologies, regulatory measures, political interventions, concerns regarding actual or potential exploitation of AI generative chatbots for malicious activities (such as fake news, algorithmic discrimination, cybercrime, etc.), and other related topics in *Politics and Regulations* (N=158, 29.15%) represented the second most covered issues. The third thematic category involved stories discussing the impact of ChatGPT and related AI advancements on culture and society, specifically the art, creative, and game industries, the use of ChatGPT for entertainment, chatbot responses to popular or current social issues (e.g., ideal sport teams, the best movies, the future of Bosnia and Herzegovina, etc.), and similar topics in *Culture and Society* (N=118, 21.77%). Topics related to *Science and Research* (N=51, 9.41%),

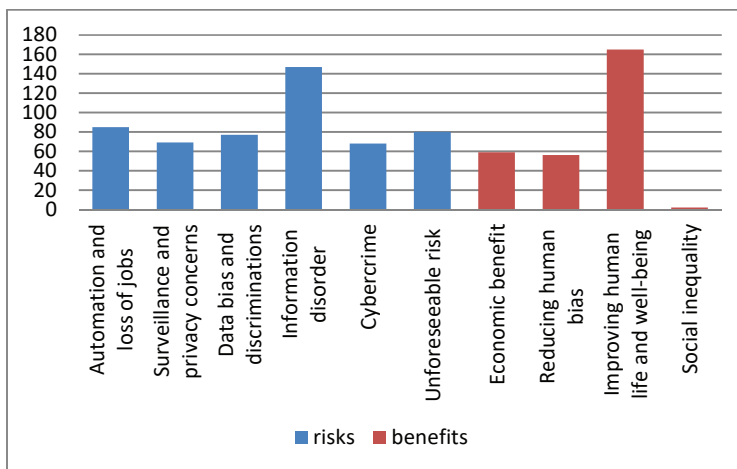
concerning the utilization of ChatGPT for scientific research and advancement, were the least reported.

News articles discussing *only risks* (N=264, 48.71%) were more prominent than news reports addressing *only benefits* (N=112, 20.66%) of ChatGPT and other related AI technologies. The messages mentioning both *risks and benefits* (N=89, 16.42%) were also observed, as well as news items where references to risks and benefits were *not clear* or included (N=77, 14.21%). References to only risks of ChatGPT were most frequent among news articles covering topics in politics and regulations of AI generative chatbots (Table 3).

Table 3
Themes and references to risks and benefits

| Themes | Risks only | Benefits only | Risks and Benefits | Not clear |
|--------------------------|--------------|---------------|--------------------|-------------|
| Business and Economy | 76 (14.02%) | 87 (16.05%) | 35 (6.46%) | 17 (3.04%) |
| Politics and Regulations | 139 (25.65%) | 1 (0.18%) | 15 (2.77%) | 3 (0.55%) |
| Culture and Society | 33 (6.09%) | 12 (2.21%) | 17 (3.14%) | 56 (10.33%) |
| Science and Research | 16 (2.95%) | 12 (2.21%) | 22 (4.06%) | 1 (0.18%) |

Figure 4
Types of risks and benefits associated with ChatGPT



Most news articles mention one or more types of risks and/or benefits. As shown in Figure 4, real or possible threats related to various forms of information disorder, such as misinformation, fake news, propaganda, or plagiarism, were the most mentioned types of risks, while references to the improvement of human life and well-being were the most common types of benefits associated with ChatGPT.

The majority of analyzed news articles (N=410, 75.64%) contain one or more sources quoted or paraphrased by journalists. The most frequently cited sources were individuals or press releases associated with business, particularly the high-tech industry (N=529, 42.28%), followed by industry affiliated scholars (N=221, 17.66%), non-industry affiliated scholars (N=185, 14.78%), and government officials or politicians (N=175, 13.98%). Artists and celebrities (N=56, 4.47%), journalists (N=40, 3.19%), ordinary individuals (N=29, 2.31%) and all other sources (N=16, 1.27%) were not prevalent in news related to ChatGPT and similar AI technologies. In terms of gender, men (N=963, 76.97%) were cited more frequently than women (N=165, 13.18%) in news articles. Additionally, in some instances (N=123, 9.83%), these characteristics were not clear or determinable (e.g., press releases, joint reports, etc.). Men were the most commonly cited news sources across nearly all types of observed sources (Table 4).

Table 4
News sources: Gender distribution

| Sources | Male | Female | Not clear (e.g. press releases, joint reports, etc.) |
|----------------------------------|--------------|------------|--|
| Business | 452 (36.13%) | 22 (1.75%) | 55 (4.39%) |
| Industry affiliated scholars | 204 (16.30%) | 17 (1.35%) | 0 (%) |
| Non-industry affiliated scholars | 123 (9.83%) | 45 (3.59%) | 17 (1.35%) |
| Government/politicians | 97 (7.43%) | 27 (2.15%) | 51 (4.07%) |
| Artists and celebrities | 34 (2.71%) | 22 (1.75%) | 0 (%) |
| Journalists | 33 (2.63%) | 7 (0.55%) | 0 (%) |
| Ordinary individuals | 11 (0.87%) | 18 (1.43%) | 0 (%) |
| Miscellaneous | 9 (0.71%) | 7 (0.55%) | 0 (%) |

Results discussion and conclusions

The emergence and societal adoption of ChatGPT generated different responses from news outlets operating in Bosnia and Herzegovina’s media landscape. Resonance and content analysis revealed which actors were absent and present within this issue space, alongside their level of engagement in covering various events associated with this innovative AI-based technology. The findings allowed for the distinction of news outlets into at least two discernible groups.

The first group comprises non-participants, including news outlets that did not provide any coverage of this issue during the observed time period, such as digital-only outlets focusing on investigative journalism and both public service and commercial broadcasters from legacy media. While the absence of stories covering ChatGPT is understandable in the case of investigative digital outlets, the lack of observed relevant messages, particularly in one of the public broadcasters in Bosnia and Herzegovina (RTRS), is unexpected. Such an outcome could be linked to the high level of political instrumentalization of public broadcasting services, a factor associated with failure of these institutions to meet their expected functions,

as indicated by previous studies (Baraković & Mahmutović, 2011; Hozić, 2008; Osmančević & Sušnjar, 2021).

The second group comprises all news outlets that contributed to the coverage of this issue, demonstrating variations in the extent of their coverage. The findings raise the question why certain legacy and digital-only news outlets provided significantly more content on ChatGPT than others. Further research is required to understand the factors influencing the observed differences in news outlets' responses.

The results from content analysis, particularly regarding thematic features and topical categorization of news items, revealed a paradoxical portrayal of AI generative chatbots. Although news articles discussed ChatGPT and similar technologies across various thematic contexts, editors and journalists predominantly positioned this coverage as a technological and foreign issue. This could affect the perceived importance of this issue and consequently audience's support and adoption of ChatGPT and related AI-based technologies.

The findings suggest that the dissemination of information about AI generative chatbots is largely dependent on news content provided by other news outlets or wire services, either domestic or international. It is important to note that this research did not assess the quality of reporting in terms of authorship originality. Given the findings of previous research (Baraković & Mahmutović, 2014), a higher share of replicated content produced by other news organizations could be expected in the content of BH news outlets. However, more research is needed not just to confirm this hypothesis but also to explore the most influential providers of news related to AI technologies.

The analysis of four thematic areas of news coverage provides preliminary insights into the preoccupations, interests, and focuses of news outlets regarding issues associated with AI generative chatbots. The findings reveal a tendency among news outlets to focus on either the risks or benefits of ChatGPT and similar AI-based products. This tendency could indicate a move toward polarized, if not oversimplified, coverage. The evidence seems to align with previous research on AI news coverage in Western developed countries (Brennen, Howard & Nielsen, 2018; Nguyen & Hekman, 2022), which indicated that news outlets tend to amplify sources associated with the business sector and high-tech industry. Whether this is a byproduct of dependency on Western news sources or an intrinsic feature of journalistic cultures in Bosnia and Herzegovina remains an open question, one that should be addressed by future research. The overrepresentation of male voices in stories concerning ChatGPT suggests a gender imbalance in news sourcing. This evidence supports the findings concerning gender bias in news reporting of Western Balkan countries addressed in previous literature (Buljubašić, 2019; Moranjak Bamburać, Jusić & Isanović, 2007; Vujović, Obradović & Mitrović, 2014). These news sourcing practices fail to acknowledge, and may even misrepresent, the significant contributions of women to AI development. This is particularly noteworthy considering that many major think tanks and research groups focusing on the social impact of AI are led by women (Brennen et al., 2019: 5).

The reporting patterns observed on AI-generated chatbots, particularly the disparity in interest among different groups of news outlets, fail to provide

audiences with consistent and diverse information about these rapidly evolving technologies. This lack of comprehensive coverage undermines the foundation for meaningful public discourse on AI-related issues. The predominant positioning of ChatGPT coverage as a technological and foreign issue by Bosnian media outlets may inadvertently contribute to the perception of AI as distant and inaccessible, potentially hindering local efforts towards technological innovation and adoption. It is recommended that media practitioners prioritize original reporting on AI developments, contextualize the social impact of AI within Bosnian society, amplify the voices of underrepresented groups, and adopt a more nuanced and balanced approach to AI reporting. These efforts are crucial for providing audiences with a comprehensive understanding of the opportunities and challenges associated with AI innovation, making it a high priority for public service media.

The limitations of this research should also be considered.

The manual content analysis was chosen as an appropriate method for conducting an exploratory study aimed at gaining preliminary insights. This method inherently possesses limited scalability. More rigorous analytic options, such as semi-supervised or unsupervised approaches utilizing machine classifications and topic modeling, would potentially yield more precise results. However, given the lack of previous research on this subject within the context of the media landscape of Bosnia and Herzegovina, the findings of this study could contribute to the establishment of benchmark datasets necessary for such analyses.

The analysis focused on the textual component of media messages. The further research should also consider the visual aspect or multimodal representations of AI in news content.

This research did not utilize qualitative approaches, like discourse analysis, but the data and findings of this research can help in performing relevant case studies that would provide a nuanced picture of news coverage of AI generative chatbots.

Preliminary findings of this exploratory research shed light on the issue of attention cycle for news media coverage of ChatGPT and its key characteristics, which could be utilized to advance knowledge on the role of media landscape in dissemination of information related to AI-based technological innovations in the context of post-communist countries.

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Appendix: News outlets sample

| No. | News outlet | News platform | Location |
|-----|--------------------------|--------------------|------------|
| 1 | Al Jazeera Balkans (AJB) | Broadcasting + web | Sarajevo |
| 2 | Bljesak.info | Web-only | Mostar |
| 3 | Buka magazin | Web-only | Banja Luka |
| 4 | Dnevni avaz | Print + web | Sarajevo |
| 5 | Dnevni list | Print + web | Mostar |
| 6 | Dnevnik.ba | Web-only | Mostar |
| 7 | Face TV | Broadcasting + web | Sarajevo |
| 8 | Faktor | Print + web | Sarajevo |
| 9 | Glas Srpske | Print + web | Banja Luka |
| 10 | Hayat TV | Broadcasting + web | Sarajevo |
| 11 | Hercegovina.info | Web-only | Mostar |
| 12 | Hrvatski medijski servis | Web-only | Mostar |
| 13 | Inforadar.ba | Web-only | Sarajevo |
| 14 | Istraga.ba | Web-only | Sarajevo |
| 15 | Klix.ba | Web-only | Sarajevo |
| 16 | N1 | Broadcasting + web | Sarajevo |
| 17 | Nezavisne novine | Print + web | Banja Luka |
| 18 | Nova BH | Broadcasting + web | Sarajevo |
| 19 | Novinska agencija Patria | News agency + web | Sarajevo |

| | | | |
|----|---|----------------------------|------------|
| 20 | Oslobodjenje/O Kanal | Print + Broadcasting + web | Sarajevo |
| 21 | Pressmediabih.com | Web-only | Sarajevo |
| 22 | Prometj.ba | Web-only | Sarajevo |
| 23 | Radio Sarajevo | Broadcasting + web | Sarajevo |
| 24 | RTV BN | Broadcasting + web | Bijeljina |
| 25 | Radio-televizija Bosansko-podrinjskog kantona (RTV BPK) | Broadcasting + web | Goražde |
| 26 | Radiotelevizija Bosne i Hercegovine (BHRT) | Broadcasting + web | Sarajevo |
| 27 | Radio-televizija Federacije Bosne i Hercegovine | Broadcasting + web | Sarajevo |
| 28 | Radiotelevizija Republike Srpske (RTRS) | Broadcasting + web | Banja Luka |
| 29 | Radiotelevizija Herceg-Bosne (RTV H-B) | Broadcasting + web | Mostar |
| 30 | Radio-televizija Tuzlanskog kantona (RTV TK) | Broadcasting + web | Tuzla |
| 31 | Slobodna Bosna | Web-only | Sarajevo |
| 32 | Source.ba | Web-only | Sarajevo |
| 33 | Srpskainfo.com | Print + web | Banja Luka |
| 34 | Start | Print + web | Sarajevo |
| 35 | Stav | Print + web | Sarajevo |
| 36 | Tacno.net | Web-only | Mostar |
| 37 | TVSA | Broadcasting + web | Sarajevo |
| 38 | Vecernji list | Print + web | Mostar |
| 39 | Vijesti.ba | Web-only | Sarajevo |
| 40 | Zurnal.info | Web-only | Sarajevo |

Četbot generativne veštačke inteligencije u medijima: Novinarsko izveštavanje o ChatGPT u Bosni i Hercegovini

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Apstrakt

U studijama difuzije inovacija, novinarsko izveštavanje prepoznaje se kao značajan faktor u razvijanju svesti i sticanju znanja o inovacijama, s potencijalom da ubrza ili uspori proces njene adaptacije. U pogledu inovacija povezanih s veštačkom inteligencijom ova dinamika do sada je najviše proučavana u kontekstu razvijenih zemalja Zapada. Mnogo manje je poznato kako se ovi procesi odvijaju u ekosistemu vesti postkomunističkih zemalja, naročito država s nižim demokratskim standardima i slabijim ekonomskim razvojem, poput Bosne i Hercegovine. S namerom sticanja preliminarne uvida, ova studija ispitivala je kako su novinarske organizacije u Bosni i Hercegovini izveštavale o pojavi i socijalnoj adaptaciji ChatGPT, novog oblika generativne veštačke inteligencije, tokom početnih šest meseci od javne dostupnosti ove tehnologije. Korišćena je analiza sadržaja relevantnih novinarskih poruka (N=542) koje su publicirale 40 tradicionalnih i digitalnih novinarskih organizacija s ciljem istraživanja ključnih karakteristika novinarskog izveštavanja, pažnja posvećene temi tokom vremena i medijskih prikaza ove inovativne tehnologije veštačke inteligencije. Rezultati ukazuju da je mali broj medijskih kuća, uglavnom tradicionalne novinske organizacije, znatno više izveštavao o ChatGPT-u od ostalih, posebno javnih radiotelevizijskih servisa. Zaključci naglašavaju tendenciju medijskih kuća da se

fokusiraju ili na rizike ili na koristi ChatGPT-a i snažnije ističu izvore povezane s poslovnim sektorom i visokotehnološkom industrijom, u kojima preovladavaju muški glasovi.

Ključne reči: novinarstvo, veštačka inteligencija, ChatGPT, difuzija inovacija, analiza sadržaja.

Received: November 27th, 2023

Revision received: February 15th, 2024

Accepted: February 22nd, 2024