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The Use of Artificial Intelligence among Hungarian Journalists: Empirical Research

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Abstract: The study examines how the emergence of artificial intelligence has affected the journalism profession. First, it presents when the changes related to online technology appeared in the history of journalism, and then it explores the areas in which artificial intelligence applications can be adapted in the workflows of content generation, distribution, and moderation. The article also reviews what editorial regulations have appeared in the past year regarding the acceptable and ethical use of artificial intelligence. The study then describes two-stage empirical research on Hungarian journalists. The empirical study consisted of a qualitative in-depth interview part and a quantitative questionnaire study. In the qualitative phase, in October 2023, we conducted 40 in-depth interviews with Hungarian journalists. Based on this experience, we conducted a questionnaire survey with 83 respondents in the spring of 2024. The study presents and analyzes the data obtained in an international context.

Keywords: Artificial Intelligence, journalistic culture, journalistic role perception, ethical regulation

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L'utilisation de l'intelligence artificielle chez les journalistes hongrois : recherche empirique, comparaison internationale

Résumé: L’étude porte sur la manière dont l’émergence de l’intelligence artificielle a affecté la profession journalistique. Tout d’abord, il présente l’époque où les changements liés à la technologie en ligne sont apparus dans l’histoire du journalisme, puis passe en revue les domaines dans lesquels les applications de l’intelligence artificielle peuvent être adaptées dans les processus de travail de génération, de distribution et de modération de contenu. L'article passe également en revue les réglementations éditoriales publiées au cours de l'année écoulée concernant l'utilisation acceptable et éthique de l'intelligence artificielle. L’étude présente ensuite une recherche empirique en deux étapes sur les journalistes hongrois. L’étude empirique comprenait une partie d’entretiens qualitatifs approfondis et une étude quantitative par questionnaire. Dans la phase qualitative, en octobre 2023, nous avons mené 40 entretiens approfondis avec des journalistes hongrois. Sur la base de cette expérience, nous avons mené une enquête par questionnaire auprès de 83 répondants au printemps 2024. L'étude présente et analyse les données obtenues dans un contexte international.

Mots-clés: Intelligence artificielle, culture journalistique, perception du rôle journalistique, régulation éthique

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Introduction

The dominant communication technologies of each era played a decisive role in the historical development and evolution of mass communication, which, over time, became institutionalized and opened a new phase in the history of media. During the

19th century, the professionalization and innovations of the printing industry, new approaches to news gathering from the telegraph to the emergence of news agencies, had a significant impact on the development of journalism (Briggs and Burke, 2004; Barbier & Lavenier, 2004). At the end of the 19th century, newspaper publishing and the electronic form of press texts in the United States underwent changes that are shaping journalism in a similar way to the processes driven by artificial intelligence today. At that time, in the field of text creation, "electronic insiders" and "outsiders" were distinguished based on the presence or absence of journalistic expertise (Marvin, 1988). The establishment of the first university-level journalism courses also entailed the need for a scientific approach (Schudson, 2001). Walter Lippmann also formulated the concept of "Scientific Journalism" in the 1920s, which proposed the use of scientifically proven methods in journalism. As a continuation of this approach, Phillip Meyer announced the Precision Journalism program in the 1970s, which enriched the journalistic toolbox with social science methods (Meyer, 1989). From the 1960s, Database Journalism, built on early computer technology, appeared, followed by CAR (Computer-Assisted Reporting), which placed the foundations of journalism on various databases, with an emphasis on scientifically verifiable facts (Gehrke & Mielniczuk, 2017). In the early 2000s, with the rise of data journalism (data-driven journalism), the core competencies of journalists included data collection, filtering, new types of storytelling and visualization (Gray, Chambers & Bounegru, 2012). The spread of mobile internet, network communication and social networking sites opened up further technological opportunities, such as the integration of smart journalism and AI-based tools (Boczkowski 2005, Marconi, 2020, Broussard et al. 2019, Calvo-Rubio et al. 2021).

1. Journalism is Changing due to AI

Media companies are undergoing a transformation due to the challenges of AI (Deuze-Witschge 2018, Deuze-Beckett 2022). Today, this change is accelerating with the emergence of new AI-driven innovations that exploit the possibilities of technology to offer smarter and more efficient systems. The widespread use of AI in the media allows journalists to automate content production, provide personalized news services, and analyze large amounts of data in real time (Pavlik 2023). The emergence of ChatGPT was a significant milestone in the media industry, reaching 100 million active users just two months after its launch (Hu 2023). Its potential will impact the media industry and journalism as well, as AI is able to create coherent and contextually relevant text in natural language (Nishal et al. 2023, Simon 2022). Of course, the rise of AI also raises several ethical and privacy issues that have triggered regulatory debates in the media ecosystem (Lin-Lewis 2022). For example, AI-generated disinformation and deepfakes can undermine public trust, while automated content production fails to consider cultural sensitivity and ethical considerations (Pelau et al. 2021).

The launch of ChatGPT in 2022 has also brought a strong research focus to artificial intelligence (AI) research, although the scientific literature has previously examined the opportunities and risks of AI in various social segments, including manufacturing, healthcare, education, and journalism (Ribeiro et al., 2021; Jiang et al., 2017; Yang et al., 2021; Rajki, 2023). The impact of AI on journalism is being felt globally, especially in the methods of media production and content distribution, and in the redefinition of journalistic roles. The introduction of AI promises to make the media system more efficient; for example, according to Goldman Sachs, global GDP could grow by 7% per year over 10 years with the spread of AI (Briggs & Kodnani, 2023, Dodds et al 2023). However, the growth will vary globally, and the global south is expected to be at a disadvantage in terms of media industry development. North America, which accounted for 39% of AI in media use in 2021, is likely to remain the leader (AI in Media & Entertainment Market Industry Outlook 2022-2032, de-Lima-Santos et al 2024). Sahota (2023) predicts significant growth in industry, with the value of the AI market in the media and entertainment industry reaching $124.48 billion by 2028. At the same time, while new business models, such as more efficient paywall systems (Piano, Sophi), are emerging, challenges are also emerging in copyright: in 2023, the New York Times filed a lawsuit against OpenAI, alleging copyright infringement. In contrast, Axel Springer and the AP news agency have entered into a separate agreement with OpenAI, which has opened new revenue streams for them (Axel Springer and OpenAI, 2023; Newman, 2024).

The emergence of artificial intelligence (AI) in journalism is part of a broader digital transformation that is fundamentally changing the way news is gathered, reported, and consumed. The growing importance of AI is both a testament to technological advancements and an indication of the changing needs and dynamics of news consumption in the digital age (Gallagher 2020, Leiser 2020).

The emergence of artificial intelligence (AI) in journalism has brought about a paradigm shift, particularly in terms of increasing efficiency and productivity. The role of AI in automating routine tasks, such as data collection and organizing large amounts of information, is transformative (Diakopoulos 2019).

The ethical appropriateness of AI in journalism, characterized by transparent practices, reducing bias, and balancing the impact of AI, is an increasingly important concern. The literature emphasizes the need for transparency in AI-driven news processes, highlighting the importance of clarity in the algorithmic generation of news. Another critical challenge is algorithmic bias; If left unchecked, AI systems have the potential to perpetuate existing biases, thereby compromising journalistic integrity. As the role of AI in newsrooms continues to expand, it is essential that researchers maintain editorial independence and protect journalistic ethical standards amid rapid technological advances (Tunez-Lopez et al. 2021, Walters 2022).

Ethical issues related to the use of AI in journalism are particularly important, including ensuring authenticity, accountability and transparency of content. AI applications such as Pinpoint AI, Tabula AI and Open Refine support news gathering

and fact-checking, while Narrativa AI, Radar AI and Amazon Polly can be used for content generation, including translation and voice-to-text conversion. During journalistic editing, Agolo AI and ETX Studio provide support for content summarization, extraction and rewriting.

Journalists' attitudes towards AI tools are also evolving: the majority see AI as a tool that increases their creativity and efficiency, although a smaller proportion fear automation in the workplace (Soto-Sanfiel et al 2022, Sun et al. 2022). Professional organizations and educational institutions, such as the Annenberg School for Communication and Journalism at the University of Southern California, the Society of Professional Journalists, and the LSE, organize "JournalismAI" training courses to help the journalistic community learn about and apply good practices related to artificial intelligence.

The changes in the contemporary media environment are significantly transforming journalism as a practice and as a role (Hanitzsch 2017, Hanitzsch et al. 2019 Melladó 2020). Professional roles can be considered a defining segment of journalistic culture, and there has been increased interest in them in recent years. It is not surprising that the change in the perception of professional roles caused by the emergence of AI has also become the focus of research interest. Based on our previous studies, in our empirical research we sought to answer the question of how similar and different the attitudes of journalists regarding the use of AI (Andok, P Szilczl & Radetzky 2024, Andok, Szilczl, & Radetzky 2023, Radetzky 2023).

1.1. *Positive and Negative Effects of AI on Journalism*

We can distinguish the effects, on the one hand, as described above, according to the stage of the media industry, journalistic work, in which they replace or supplement journalistic, industry activity. But we can also distinguish between positive and negative effects. Among the positive effects of the appearance of AI in journalism, we can mention the increase in efficiency, the personalization of content, and the strengthening of data-driven journalism. As a negative effect, we can refer to the potential increase in bias and discrimination. The possibility of losing journalistic jobs must also be considered. And due to possible errors or misrepresentations in AI-generated content, it becomes difficult to determine responsibility. These factors highlight the complex effects of AI in journalism and why a balanced approach is important when applying the technology (Moran-Shaikh 2022) In his study, Verma (2023) mentions the following among the positive and negative effects of AI on journalism. The emergence of artificial intelligence (AI) in journalism is transforming the way we work, automating routine tasks. By taking over time-consuming tasks, AI allows journalists to delve deeper into complex stories. Especially in fast-paced environments like breaking news or live reporting, AI tools are invaluable, providing instant data analysis and content recommendations. Furthermore, AI has ushered in a new era in data analytics. It can process and analyze large datasets, which is a major change in election reporting, financial markets, and sports journalism. AI algorithms can quickly make sense of vast and complex data, revealing trends and patterns that

are invisible or difficult to detect to the human eye. (Nurelmadina et al., 2021). News personalization is another area where AI has made significant strides. By analyzing user behavior, preferences, and past interactions, AI can effectively shape news feeds. The negative effects of artificial intelligence in journalism raises a few ethical questions. From an ethical perspective, the use of AI algorithms to select and prioritize news stories raises important concerns about bias and transparency. These algorithms are often opaque and may unintentionally perpetuate existing biases acquired during their training, raising questions about the impartiality and accountability of AI-driven journalism. In addition, issues of copyright and credibility come to the fore, as readers often unknowingly consume AI-generated content, generating trust and credibility debates in journalism. Another significant concern is the potential for job losses in journalism due to the rapid development of AI. As AI systems become increasingly capable of performing complex tasks, there is growing fear that they may replace human journalists, especially in routine reporting and data analysis. This technological shift not only threatens employment but may also reduce the intrinsic value of human journalistic skills and insights, which may be overshadowed by automated processes. Studies by Qureshi and Tekin (2020) highlight the risks of AI-generated realistic content production, particularly the creation of deepfakes and synthetic media. While AI facilitates efficient news generation, it also poses a threat to the integrity of news and information through the potential spread of disinformation. The ability to produce highly realistic, manipulated audio and video content (deepfakes) highlights the urgent need to ensure that AI-generated content remains accurate and is not used to deceive or mislead audiences.

2.1. *Research Objectives and Significance*

Despite the rapidly expanding international literature on the integration of artificial intelligence (AI) into journalism practices, a clear research gap persists concerning its adoption and perception within specialized, value-driven subfields of the profession, particularly religious and church-affiliated media ecosystems. While numerous studies have explored AI's transformative effects on mainstream, commercial, or public-service journalism in North America, Western Europe, and parts of Asia (e.g., Diakopoulos 2019; Pavlik 2023; de-Lima-Santos et al. 2024), virtually no empirical research has examined how AI tools are perceived, adopted, or resisted by journalists operating within religiously oriented media outlets—especially in Central and Eastern European contexts where ecclesiastical institutions maintain significant media presence and journalistic cultures remain strongly influenced by confessional identity, ethical frameworks rooted in theology, and institutional hierarchies. The present study addresses this gap by investigating the emergence and reception of AI in Hungarian religious and church-related journalism. Its primary objective is to map the attitudes, experiences, and anticipated professional role changes among journalists working for Catholic, Protestant, and other denominational media outlets in Hungary, with particular attention to the period following the public release of ChatGPT in late 2022. Methodologically, the research is based on a nationwide survey completed by 83 religious journalists. Although the Hungarian

Catholic Journalists' Association (MAKÚSZ) alone has approximately 1,500 members, the broader pool of actively practicing religious journalists in Hungary is considerably smaller and more tightly knit, rendering the achieved response rate statistically and sociologically meaningful for this niche segment. This focus on the Hungarian context is particularly pertinent for several reasons. First, religious media in Hungary continue to play a distinctive role in public discourse, often functioning as alternative public spheres that prioritize moral, spiritual, and community-oriented narratives over market-driven imperatives. Second, the country's media landscape remains polarized and heavily influenced by political and institutional affiliations, making religious outlets one of the few remaining domains where journalistic autonomy is framed primarily through confessional rather than commercial or state-related pressures. Third, the strong presence of historically rooted churches and the relatively conservative professional culture within Hungarian religious journalism offer a valuable counterpoint to the predominantly secular, innovation-embracing environments examined in the global North. Understanding how AI is perceived in this specific milieu therefore not only fills an empirical void but also contributes theoretical insights into the interplay of technological disruption, professional identity, and value-based journalism in semi-peripheral European media systems.

2. **Research**

2.1. *Hypotheses and Methodology of Research*

The objective of this questionnaire-based study is to assess the attitudes of Hungarian journalists and media professionals toward the use of artificial intelligence (AI), as well as to examine the application of AI in both private and professional contexts. Additionally, the research investigates the extent to which, and in which domains, these professionals anticipate transformations in journalism due to AI. Given the limited empirical evidence available in Hungary on this topic, the study applies an exploratory approach.

Four hypotheses were formulated:

- **H1**: Professionals working in online media utilize AI tools more frequently and across a broader range of applications in their work compared to those in radio or television.

- **H2**: Employees of local and regional media outlets employ AI tools more often and, in more areas, than their counterparts at national media organizations.

- **H3**: Hungarian journalists expect more significant changes from AI in the areas of visual content creation and image generation than in text composition tasks.

- **H4**: Hungarian journalists anticipate a greater impact of AI on the production of entertainment content than on public affairs content.

In October 2023, 40 in-depth interviews were conducted with Hungarian journalists to explore their attitudes toward AI. Building on these findings, a questionnaire comprising 28 questions (4 open-ended and 24 closed-ended) was distributed via the Survio.com platform between February 22 and April 8, 2024. The survey was completed by 83 journalists. A convenience sampling method was employed, with participants recruited through email outreach. The sample included professionals from national and regional media, as well as public service and commercial outlets, who participated voluntarily. Although efforts were made to include respondents from different types of news organizations, the sample is not representative of the Hungarian journalistic population, and therefore, the findings should be interpreted as descriptive and exploratory rather than generalizable. This study presents an analysis of the data collected from the questionnaire.

2.2. *Demographic Data*

The questionnaire was completed by 83 individuals, all of whom were journalists or media professionals. Of the respondents, 56.6% were male, and 43.4% were female. In terms of age distribution, most participants were aged 56 and older (41%), followed by those aged 46–55 (28.9%). The proportion of respondents aged 36–45 was 16.9%, while those under 35 accounted for just over 10% (18–25 years: 3.6%; 26–35 years: 9.6%).

Regarding their workplace, the highest proportions of respondents were employed in radio (48.2%), online journalism (42.2%), and print media (27.7%). Representation from television (15.7%), news agencies (7.2%), and other online content creation sectors remained below 20%. More than one-third of the respondents (36.1%) worked for church-owned media organizations, one-quarter (27.7%) for privately owned entities, one-fifth (19.3%) for community-based outlets, and 16.9% for state-owned media companies. Over half of the respondents (55.4%) were employed by national media outlets, while one-quarter (25.3%) worked for regional organizations. The proportions of those at local (12%) and international (7.2%) media outlets were relatively low. The duration of professional experience in the media field was also examined. Consistent with the age data, 60% of respondents had been working in the profession for more than two decades. The remaining experience categories (0–5 years, 5–10 years, 10–15 years, and 15–20 years) ranged between 3% and 13%. Given the small and non-representative sample, these demographic distributions should be interpreted with caution, as they may not reflect the broader characteristics of the Hungarian journalistic community. To test the hypotheses, non-parametric statistical methods were employed due to the non-normal distribution of the data. The Wilcoxon test was used for paired comparisons (e.g., private vs. professional AI use), the Mann-Whitney U test for comparing two independent groups (e.g., online vs. offline journalists), and the chi-square test for examining relationships between categorical variables. The significance level was set at $p < 0.05$; however, given the exploratory nature of the study and the small sample size, statistical findings should be interpreted with caution, and non-significant trends should not be overgeneralized.

2.3. *Digitalization and Journalism*

The research examined how digitalization has transformed journalistic work. Respondents were asked to rank the following five factors in order of importance: 1) technological substitution of human labor, 2) decline in quality, 3) increase in the number of content creators, 4) channel expansion, and 5) acceleration of data acquisition. The results indicate that 73.5% of respondents considered the automation of human labor to be the most significant factor, reflecting their view that AI tools replace numerous tasks, thereby reducing the demand for the human workforce. The proliferation of online media and AI not only enhances cost efficiency but is perceived by many respondents to contribute to a decline in quality. Improper use of AI—often driven by the pursuit of faster production and higher viewership—was also mentioned as a factor that may degrade content standards, a finding supported by the fact that 53% of respondents ranked quality decline as the second most important factor.

The low entry barriers of the internet and social media enable anyone to produce online content, a trend amplified by AI tools, which often results in the mass production of low-quality material. This is reflected in the fact that 51.8% of respondents ranked the increase in the number of content creators third. Channel expansion was placed fourth by 45.8% of respondents, while 69.9% ranked the acceleration of data acquisition fifth. Although digitization expands the number of channels, its significance is overshadowed by other factors, possibly because only a few platforms (e.g., Facebook, Instagram, YouTube) have emerged as globally dominant.

2.4. *Types of Applications in Professional and Personal Use*

In the following two questions, we investigated how frequently Hungarian journalists use artificial intelligence (AI)-based tools in five specified domains—chatbots, image editing and generation, video editing and generation, translation, and transcription—both as private individuals and as professional media content creators. The results are presented in Table 1.

Table 1. *Frequency of Use of AI Application Types by Journalists as Private Individuals and Professional Media Content Creators (Data in Percentages)*

%	Do Not Use		Occasionally		At Least Weekly	
	Private	**Professional**	**Private**	**Professional**	**Private**	**Professional**
Chatbots	65.1	71	24.1	18.1	10.8	10.8
Image Editing/Generation Apps	62.7	62.7	26.5	24.1	10.8	13.2
Video Editing/Generation Apps	66.3	74.7	25.3	18.1	8.4	7.2
Translation Apps	31.3	37.3	31.3	26.5	37.4	36.1

Transcription Apps/Speech Generators	75.9	75.9	21.7	16.9	2.4	7.2

The data in Table 1 reveals that, across four of the five domains examined (chatbots, image editing, and generation, video editing and generation, and transcription), between 65.1% and 75.9% of the responding journalists neither use AI applications as private individuals nor as professional media content creators. For chatbots (71% vs. 65.1%) and video editing applications (74.7% vs. 66.3%), usage is lower in professional contexts than in personal ones, whereas the proportion of non-users of translation applications is similar in both contexts (37.3% vs. 31.3%).

The notably low usage of transcription applications (75.9% do not use them may be related to respondents' experiences with the technology's inaccuracies when processing Hungarian-language content, such as errors in automated transcription. Only about one-quarter of respondents use these tools at least occasionally.
Among the five domains listed, translation applications emerged as the most popular AI tools. Nearly 40% of the surveyed journalists use them at least weekly, both as private individuals (37.4%) and as professional media content creators (36.1%). Approximately one-third of respondents do not use AI translation tools in either capacity (31.3% as private individuals; 37.3% as professionals).

None of the variables examined followed a normal distribution, as confirmed by descriptive statistics (e.g., differences between mean and median, skewness, kurtosis) and normality tests (Kolmogorov-Smirnov and Shapiro-Wilk, $p = .000$). Consequently, the Wilcoxon test was employed to determine whether significant differences exist between personal and professional usage for each tool. The analysis indicates no statistically significant differences between personal and professional use of the AI tools examined in any of the domains.

2.5. *Number of Application Tool Types Used in Professional and Personal Contexts*

It is also worthwhile to examine how many of the five specified domains (chatbots, image editing and generation, video editing and generation, translation, and transcription) are used at least occasionally by journalists for AI-based applications (see Figure 1). On average, respondents use AI applications in nearly two domains (1.99) as private individuals and in 1.78 domains as professional media content creators.

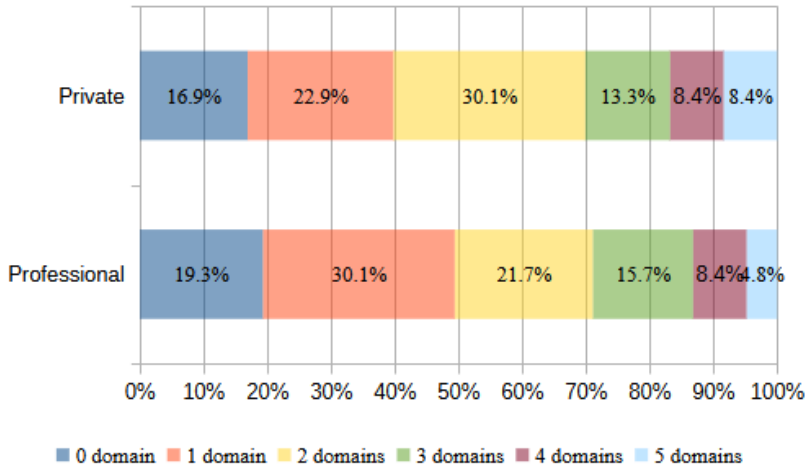


Figure 1. *Number of Domains in Which Journalists Use AI-Based Applications at Least Occasionally as Private Individuals and Professional Media Content Creators (Data in Percentages)*

The data from Figure 1 indicate that nearly one-fifth of the surveyed journalists do not use AI applications even occasionally, either in their professional work (19.3%) or as private individuals (16.9%). Slightly more than 50% of respondents use AI tools in one or two domains. As private individuals, the most common pattern is the use of AI tools in two domains at least occasionally (30.1%), while as professional media content creators, the most frequent usage occurs in one domain (30.1%). Less than 20% of respondents use AI tools in four or five domains, either as private individuals (16.8%) or as journalists (13.2%).

Neither of the two variables examined followed a normal distribution. Therefore, the Wilcoxon test was applied, and no statistically significant difference was found between personal and professional use regarding the number of application domains.

2.6. *AI Use in Professional Contexts by Online and Offline Journalists*

Use of Specific AI Tools in Professional Settings by Online and Offline Journalists. It is worth examining whether there are notable differences in the professional use of various AI application types between journalists working in online and offline journalism (see Table 2). Our hypothesis (H1) posits that journalists in online media use AI tools significantly more frequently and across a broader range of applications in their work compared to those in radio or television.

During the analysis, respondents who indicated involvement in at least one online domain were classified as online journalists, even if they also reported working in an offline domain. Accordingly, 45 journalists were categorized as online journalists, and 38 as offline journalists.

Table 2. *Frequency of Use of AI Application Types by Online and Offline Journalists as Professional Content Creators (Data in Percentages)*

%	Do Not Use		Occasionally		At Least Weekly	
	Online Journalists	**Offline Journalists**	**Online Journalists**	**Offline Journalists**	**Online Journalists**	**Offline Journalists**
Chatbots	62.2	81.6	17.8	18.4	20	0
Image Editing/Generation Apps	55.6	71.1	22.2	26.8	22.2	2.6
Video Editing/Generation Apps	68.9	81.6	20	15.8	11.1	2.6
Translation Apps	28.9	47.4	26.7	26.3	44.5	26.4
Transcription Apps/Speech Generators	75.6	76.3	15.6	18.4	8.9	5.3

The data in Table 2 suggest that, for four out of the five AI application types, there are notable differences between journalists in online and offline journalism. The exception is transcription applications and speech generators, where no significant difference is observed between the two groups. In both groups, approximately three-quarters of respondents (75.6% online, 76.3% offline) do not use AI tools in this domain, with only 15–19% using them occasionally and 5–9% at least weekly in their professional tasks.

For the other four application types (chatbots, image editing/generation applications, video editing/generation applications, and translation applications), our hypothesis appears to be supported. Across these domains, offline journalists exhibit a markedly higher proportion of non-users of AI tools and are underrepresented, by a similar margin, among those who use these four AI application types frequently (at least weekly).

However, chi-square test results indicated statistically significant differences between online and offline journalists in only two cases: chatbots ($\chi^2 = 6.899$, $df = 2$, $p = 0.032$) and image editing tools ($\chi^2 = 8.691$, $df = 2$, $p = 0.013$), with online journalists more likely to use both. The finding for chatbots is nuanced by low expected cell frequencies, suggesting caution in interpretation.

Thus, the aspect of our hypothesis stating that online journalists use a broader range of AI tools in their work is partially confirmed.

2.7. *Number of AI Tool Types Used in Professional Contexts by Online and Offline Journalists*

It is also valuable to investigate how many of the five specified domains of journalists in online and offline journalism use AI-based applications at least occasionally in their professional work (see Figure 2).

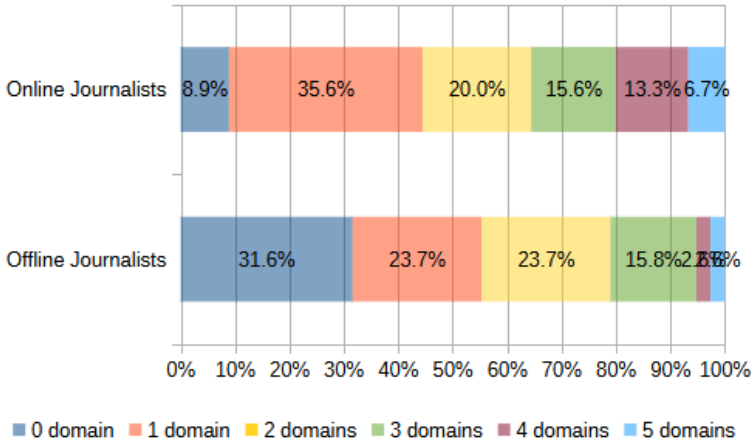


Figure 2. *Number of Domains in Which Online and Offline Journalists Use AI-Based Applications at Least Occasionally as Professional Media Content Creators (Data in Percentages)*

The Mann-Whitney U-test results indicate that online journalists use AI-based tools significantly more frequently and across more domains in their work compared to offline journalists ($p = 0.035$). This aligns with the finding that online journalists use an average of 2.1 AI tool types, while offline journalists use an average of 1.4.

The data from Figure 2 reveal that nearly one-third of offline journalists (31.6%) do not use any of the five specified AI application types in their work, compared to only 8.9% of online journalists. Conversely, one-fifth of online journalists use 4–5 AI application types at least occasionally, while this proportion is just 5.2% among offline journalists. The Pearson chi-square test does not provide clear evidence of a relationship between the variables ($p = 0.073$), though the Linear-by-Linear Association suggests a potential linear trend ($p = 0.031$). However, the reliability of this test is limited due to low expected frequencies.

Our hypothesis is partially confirmed. Table 2 shows that online journalists use all examined AI tool types more frequently at least weekly compared to offline journalists (except for transcription applications), with particularly striking differences for chatbots (20% vs. 0%) and image editing tools (22.2% vs. 2.6%). Figure 2 and the Mann-Whitney U-test ($p = 0.035$) corroborate that online journalists use an average of 2.1 tool types compared to 1.4 for offline journalists—a significant difference that supports the hypothesis's claim of "broader" use. However, chi-square tests showed significant differences for only two tool types (chatbots and image editing tools). For video editing and translation applications, the differences did not reach statistical significance, indicating that the hypothesis does not hold across all tool types. Transcription applications are an exception, showing no notable difference between groups, which weakens the hypothesis's broader applicability. The greater openness of online journalists to AI may be related to factors such as higher digital literacy, greater acceptance of technology in media content production, and increased openness to new technological innovations.

2.8. *AI Use in Professional Contexts by Journalists at Local, Regional, and National Media Outlets*

Use of Specific AI Tools in Professional Settings by Journalists at Local/Regional and National/International Media. It is worth investigating whether there are significant differences in the professional use of various AI application types between journalists working at local/regional media outlets and those at national/international media outlets (see Table 3). Our hypothesis (H2) posits that journalists at local and regional media outlets use AI tools significantly more frequently and across more domains in their work compared to those at national media outlets. In our sample, 31 journalists worked in local/regional media, while 52 were employed in national/international media.

Table 3. *Frequency of Use of AI Application Types by Journalists at Local/Regional and National/International Media as Professional Content Creators (Data in Percentages)*

	Do Not Use		**Occasionally**		**At Least Weekly**	
	Local/Regional	**National/International**	**Local/Regional**	**National/International**	**Local/Regional**	**National/International**
Chatbots	71	71.2	19.4	17.3	9.7	11.5
Image Editing/Generation Apps	51.6	69.2	32.3	19.2	16.2	11.5
Video Editing/Generation Apps	74.2	75	19.4	17.3	6.5	7.6
Translation	32.3	40.4	22.6	28.8	45.2	30.8

Apps						
Transcription Apps/Speech Generators	71	78.8	22.6	16.9	6.5	7.7

The data reveals some differences between the two groups of journalists for two of the five application types. Among journalists in local/regional media, the proportion of non-users of image editing and generation AI applications is significantly lower (51.6% vs. 69.2%), while the proportion of occasional users in this domain is higher (32.3% vs. 19.2%). Additionally, local/regional journalists are substantially overrepresented among those who use translation applications regularly (at least weekly) (45.2% vs. 30.8%). A possible explanation is that journalists at regional newsrooms, operating with smaller teams to fulfill local reporting duties, rely more heavily on AI tools to expand media content. This is partially supported by evidence that they translate and publish more content from international news flows using AI tools compared to their counterparts at national media outlets. Furthermore, they use image generation tools more frequently, though this is primarily occasional use. However, chi-square tests did not indicate statistically significant differences for any application type, meaning the part of our hypothesis regarding more frequent use is not confirmed.

2.9. *Number of AI Tool Types Used in Professional Contexts by Journalists at Local/Regional and National/International Media*

It is also useful to examine how many of the five specified domains journalists at local/regional and national/international media use AI-based tools at least occasionally in their work (see Figure 3). On average, journalists at local and regional media outlets use two application types, while those at national and international media use 1.65 application types at least occasionally in their professional activities. However, the Mann-Whitney U test did not reveal a statistically significant relationship.

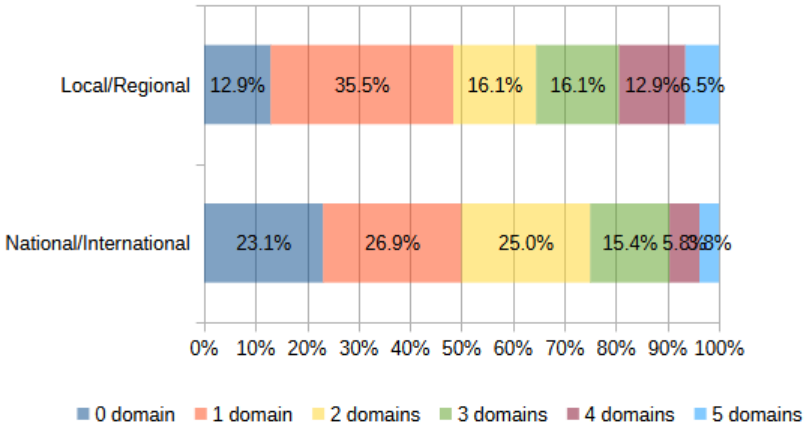


Figure 3. *Number of Domains in Which Journalists at Local/Regional and National/International Media Use AI-Based Applications at Least Occasionally as Professional Media Content Creators (Data in Percentages*

According to Figure 3, one-quarter of journalists in national/international media (23.1%) do not use any of the specified AI application types in their work, compared to only 12.1% of those in local/regional media. Conversely, nearly one-fifth of local/regional journalists (19.4%) use 4–5 application types, while this proportion falls below 10% (9.6%) among those in national/international media. None of the chi-square tests demonstrated a statistically significant relationship, indicating that ~~the~~ part of our hypothesis concerning the use of a broader range of tool types is not statistically confirmed.

Challenges Posed by AI. In the following question, we sought to understand the extent to which journalists perceive the presence of AI as a challenge across seven specified domains in their professional work (see Table 4).

Table 4. *To What Extent Are the Following Areas Considered Challenges in Light of AI for Journalists? (Data in Percentages)*

	Significant Challenge	Moderate Challenge	Minor or No Challenge
Decline in Journalism Quality	54.2	33.7	12
Increase in Disinformation (Fake News)	78.3	18.1	3.6
Loss of Human Diversity Behind AI's Neutral Tone	51.8	32.5	15.6

Unresolved Ethical Questions Regarding Responsibility	66.3	24.1	9.6
Algorithms and Click Counts Dominating Text Creation	60.2	24.1	15.6
The Blurring of Real and Generated Reality	72.3	20.5	7.2
Lack of Audience Competence and Critical Judgment	61.4	33.7	4.8

According to the data in Table 4, three-quarters of the surveyed journalists identify the greatest challenges posed by AI as the increase in disinformation (78.3%) and the blurring of real and generated reality (72.3%). This aligns with the known tendency of AI applications to "hallucinate," confidently presenting fabricated content as factual. Without proper human oversight, AI algorithms may easily produce disinformation-laden content and may obscure the distinction between reality and AI-generated material. The next three areas perceived as significant challenges by nearly two-thirds of respondents are "unresolved ethical questions regarding responsibility" (66.3%), "algorithms and click counts dominating text creation" (60.2%), and "lack of audience competence and critical judgment" (61.4%). Slightly fewer respondents, though still over half, express concern about the "decline in journalism quality" (54.2%) and the "loss of human diversity behind AI's neutral tone" (51.8%), yet these areas are also seen as posing significant challenges by the majority.

The challenges posed by AI are a source of concern for most respondents. On average, they view AI as a significant problem in 4.5 out of the 7 listed domains. One-fifth of respondents (21.7%) believe all 7 areas present serious challenges, while over two-thirds (69.9%) identify at least 4 areas as problematic. In contrast, only 6% of respondents believe that AI does not pose a significant challenge in any of the listed domains for journalism.

2.10. *Expected Impact of AI on Various Areas of Journalism*

In the following question, we asked respondents to assess the extent to which they believe AI will transform specific areas of journalism (see Table 5).

Table 5. To What Extent Will AI Transform the Following Areas of Journalism? (Data in Percentages)

	Not at all	Moderately	Significantly	Completely	Significantly + Completely
Content Planning Process	14.5	41	42.2	2.4	**44.6**
News Gathering Process	6	14.5	59	20.5	**79.5**
Data Collection Process	6	12	54.2	27.7	**81.9**
Press Review	7.2	26.5	49.4	16.9	**66.3**
Content Adoption from Other Media	8.4	30.1	42.2	19.3	**61.3**
Translation from Other Media	7.2	18.1	47	27.7	**74.7**
Content Promotion Process	7.2	24.1	38.6	30.1	**68,7**
Real Data Collection Process	6	12	51.8	30.1	**81.9**
Data Visualization Process	6	16.9	55.4	21.7	**77.1**
Filtering Out Fake News	18.1	37.3	28.9	15.7	**44.6**
Interview Preparation Process	26.5	51.8	15.7	6	**21.7**
Rewriting Original Material During Editing	9.6	36.1	38.6	15.7	**54.3**
Enhancing Manipulation Opportunities	4.8	8.4	27.7	59	**86.7**
Improve Quality Control Efficiency	34.9	31.3	24.1	9.6	**33.7**

More than four-fifths of the surveyed journalists believe that the rise of AI will significantly enhance opportunities for manipulation (86.7%) and substantially transform the (real) data collection process (81.9%). Closely following are news gathering (79.5%), data visualization (77.1%), translation from other media (74.7%), press reviews (66.3%), the content promotion process (68.7%), and content adoption from other media (61.3%). In these areas, two-thirds to three-quarters of the journalists surveyed anticipate significant or complete transformation due to AI. Considerably lower expectations are observed for the content planning process (44.6%), filtering out fake news (44.6%), and rewriting original material during editing (54.3%), where roughly half of the journalists foresee significant changes. Only about one-third to one-quarter of respondents believe AI will play a substantial role in improving quality control efficiency (33.7%) or the interview preparation process (21.7%).

Across the 14 areas listed, the surveyed journalists, on average, expect AI to bring significant change to 8.67 areas, though the median value is 10. This indicates that the majority of journalists anticipate more substantial transformations. Only 8.4% of the responding Hungarian journalists believe that AI will bring significant change to a few (0–4) areas of the journalism process. In contrast, half (51.8%) believe that AI will significantly impact at least 10 of the listed areas in the journalism process.

2.11. *Hungarian Journalists' Openness to AI Use Across Journalism Genres*

In the next section of our research, we asked respondents to indicate the extent to which they can envision the application of AI in seven specified journalism genres (see Table 6).

The marked divergence in acceptance between fully automated content creation on online platforms (67.5% high/perfect applicability) and traditional text-based journalistic genres (14.5–20.5%) can be theoretically explained through the lens of genre-specific professional role conceptions and the perceived threat to journalistic authorship and agency. In the hierarchy of journalistic genres, reports, interviews, editorials, columns, and essays are traditionally regarded as core manifestations of interpretive, accommodative, and advocacy-oriented roles that demand personal voice, contextual theological-moral judgment, and direct accountability to the faith community—attributes that religious journalists in particular consider non-delegable to machines (Mellado, 2020; Hanitzsch et al., 2017). Fully automated content creation, by contrast, is typically associated with low-involvement, high-volume informational or service-oriented sub-genres (e.g., event listings, weather summaries, short news briefs, liturgical calendars) that fall outside the domain of the real authentic journalistic authorship (Carlson, 2015; Broersma & Peters, 2021). These genres are perceived as functionally utilitarian rather than existentially expressive, thereby lowering the perceived ethical and identity-related costs of automation (Diakopoulos, 2019; Montal & Reich, 2017). Thus, the exceptionally high acceptance of AI in "fully automated content creation" does not contradict the broader rejection of AI in text-heavy genres; rather, it reflects a boundary-drawing practice in which journalists protect the professional core of meaning-making and value-laden writing while willingly delegating peripheral, routinized textual production to algorithmic systems (Lewis & Westlund, 2015; Carlson, 2018).

Table 6. To What Extent Can You Envision AI Applications in the Following Genres? (Data in Percentages)

	Not Applicable	Slightly Applicable	Highly Applicable	Perfectly Applicable	Highly + Perfectly Applicable
Transitional Genres on News Portals (e.g., Reports, Interviews)	33.7	51.8	14.5	0	**14.5**
Opinion Genres on News Portals (e.g., Editorials, Criticism, Columns, Essays)	43.4	36.1	20.5	0	**20.5**

Magazine Editing in Radio	15.7	61.4	20.5	2.4	**22.9**
Music Editing in Radio	10.8	30.1	32.5	26.5	**59**
Visual Elements in Television (e.g., CGI, Camera Systems, Directing Tasks)	8.4	27.7	48.2	15.7	**63.9**
Fully Automated Content Creation on Online Platforms	13.3	19.3	47	20.5	**67.5**
Comment Moderation	7.2	34.9	42.2	15.7	**57.9**

The data in Table 6 reveal that the majority of surveyed journalists most readily envision AI use in fully automated content creation on online platforms (67.5%) and in the visual elements of television (63.9%). Closely following are music editing on the radio (59.0%) and comment moderation (57.9%). Conversely, journalists are least likely to see AI as applicable in transitional genres on news portals (14.5%), opinion genres on news portals (20.5%), and magazine editing on radio (22.9%).

One of our study's hypotheses (H3) posits that Hungarian journalists expect significantly greater transformation from AI in the domains of visual content and image generation compared to text creation. The data in Table 9 support this: in visual domains (e.g., television visuals, including CGI, camera systems, and directing tasks), 63.9% of respondents consider AI highly or perfectly applicable, whereas in traditional text-based genres, the figures are much lower—14.5% for reports and interviews and 20.5% for opinion genres. This difference is statistically significant, as confirmed by z-test values comparing television visuals to reports ($z \approx 6.54$, $p < 0.001$). However, an exception within text creation is fully automated content production on online platforms, where 67.5% of respondents see AI as highly or perfectly applicable. This modern form of text production enjoys notable acceptance alongside visual applications. Thus, our hypothesis is partially confirmed: AI's applicability in visual domains indeed garners higher acceptance than in traditional text-based forms. However, text creation is not uniformly rejected, as automated content production stands out as a significant exception, receiving positive regard among Hungarian journalists.

On average, the surveyed journalists envision AI to be highly or perfectly applicable in 3.1 of the seven listed genres. One-third of respondents (approximately 33%) can imagine significant AI use in only 0–2 genres, while just over one-fifth (21.6%) believe AI could be highly or perfectly applicable in the majority (5–7) of genres. The largest group (44.6%) considers AI highly or perfectly applicable in about half of the specified genres.

2.12. *Hungarian Journalists' Openness to AI Use Across Thematic Fields*

We also separately examined the thematic fields in which journalists most envision the application of AI (see Table 7).

Table 7. In Which Thematic Fields Can You Envision AI Application? (Data in Percentages)

	Not at All	**Slightly**	**Highly**	**Completely**	**Highly + Completely**
Public Affairs News and Events (Domestic and Foreign Policy)	30.1	47	15.7	7.2	**22.9**
Cultural Content (News, Reviews, Critiques)	34.9	41	22.9	1	**23.9**
Economic Content (Stock Market News, Analyses)	16.9	28,9	37.3	16.9	**54.2**
Sports-Related Content	15.7	43,4	34.9	6	**40.9**
Entertainment Content	14.5	34,9	36.1	14.5	**50.6**
Globally Relevant Content	14.5	38,6	37.3	9.6	**46.9**
Locally Relevant Content	26.5	47	26.5	0	**26.5**
Religious Content	37.3	45,8	14.5	2.4	**16.9**

We listed eight thematic fields. In two of these, the majority of respondents believe AI tools are highly or completely applicable: economic content (54.2%) and entertainment content (50.6%). Slightly below 50% but still notable are sports-related content (40.9%) and globally relevant content (46.9%). In the remaining fields, fewer than 25% of respondents envision AI to be highly or completely applicable: public affairs news and events (22.9%), cultural content (23.9%), locally relevant content (26.5%), and religious content (16.9%).

Our fourth hypothesis (H4) asserts that Hungarian journalists expect AI to bring significantly greater change to entertainment content than to public affairs content. The data in Table 10 support this: 50.6% of respondents consider AI highly or completely applicable to entertainment content, compared to only 22.9% for public affairs content. This pronounced difference is statistically significant, as confirmed by a z-test ($z = 3.69$, $p < 0.001$), indicating that Hungarian journalists are more optimistic about AI's role in entertainment genres than in public affairs topics. Additional data reinforce that AI's acceptance extends beyond entertainment:

economic topics (54.2%) and globally relevant content (46.9%) also receive high approval. For economic content, many aspects—such as technical analyses – may be seen as automatable. However, it is worth noting that more complex economic events, contextual insights, and fundamental analyses require a level of effort comparable to that of domestic or foreign policy articles. Overall, Hypothesis 6 is confirmed: the acceptance of AI applications in entertainment content significantly surpasses that in public affairs content, reflecting differing professional attitudes toward these content types.

It is also worth exploring how many of the eight thematic fields journalists believe AI tools are highly or completely applicable to. On average, respondents identified 2.81 fields. The scepticism of journalists is evident: 30.1% see no fields, and another 30% envision only 1–3 fields where AI could be highly or completely applicable. Only a negligible proportion (7.2%) would broadly apply AI tools across 7–8 fields.

3. **Discussion**

The research examined how artificial intelligence influences the work of Hungarian journalists, in what areas it is used, and what challenges and transformations are expected from it. The results can be summarized in the following main points. First, it is worth highlighting that the use of AI among Hungarian journalists is low. Most respondents (65.1–75.9%) do not use AI tools, such as AI chatbots, image or video editors, or transcription applications, either in their private lives or at work. The exception is translation applications, which 36.1–37.4% use at least weekly. The majority of respondents consider AI to be a significant challenge, especially the increase in disinformation (78.3%), the blurring of reality and generated content (72.3%), the lack of clarity of ethical responsibility (66.3%), and the lack of critical thinking among the audience (61.4%). On average, 4.5 areas out of 7 were identified as significant problems.

AI is most likely to significantly transform data collection (81.9%), news gathering (79.5%) and manipulation options (86.7%), while interviewing (21.7%) and quality control (33.7%) are less likely.

AI is most widely accepted in online automated content production (67.5%), television visuals (63.9%) and comment moderation (57.9%), but less so in transitional (report, interview: 14.5%) and opinion genres (20.5%).

Hungarian journalists consider economic (54.2%) and entertainment (50.6%) content to be most AI-compatible, while public affairs (22.9%) and religious (16.9%) topics have low acceptance.

The research examined four hypotheses:

H1: Online journalists use more AI tools more often and in more diverse ways than radio and television journalists. The hypotheses (H1–H4). Below I summarize the answers to each hypothesis: hypothesis is partially confirmed: online journalists

use more tool types on average (2.1 vs. 1.4), and the difference is statistically significant for chatbots and image-editing applications ($p < .05$), although not for all examined tool categories.

H2: Local and regional journalists use AI more often and, in more areas than national journalists. Local/regional journalists use AI slightly more (2 vs. 1.65), but the difference is not significant, therefore the hypothesis is not confirmed.

H3: Hungarian journalists expect a greater transformation in visuality and image generation than in text creation.

Our hypothesis was partially confirmed. The television visual domain (63.9%) significantly exceeds traditional text genres (14.5–20.5%, $p < 0.001$), but online automated text production (67.5%) is an exception.

H4: Hungarian journalists expect a more significant impact from AI on entertainment content, AI on public affairs. The result is confirmed. Entertainment content (50.6%) significantly exceeds public affairs content (22.9%, $p < 0.001$).

The findings of this study underscore the nuanced integration of AI within Hungarian journalism, particularly in religiously oriented media, where confessional values and ethical frameworks appear to temper enthusiasm for technological adoption. In comparison to international benchmarks, such as those from the Reuters Institute, Hungarian journalists exhibit a more conservative stance, with lower overall AI usage rates potentially attributable to the semi-peripheral position of the Hungarian media ecosystem and the influence of ecclesiastical hierarchies that prioritize human-centered moral discernment over algorithmic efficiency. This reticence aligns with broader Central European patterns, where journalistic cultures emphasize interpretive roles rooted in historical and cultural contexts, yet it contrasts with the accelerated AI uptake in North American newsrooms, where generative tools like ChatGPT are increasingly embedded in content workflows. The pronounced skepticism toward AI in public affairs and religious content may reflect a protective boundary-drawing mechanism, safeguarding domains perceived as intrinsically tied to spiritual authenticity and communal trust against perceived risks of dehumanization and bias amplification).

The primary limitation of the study is its modest sample size ($N = 83$), which precludes any claim of representativeness for the broader population of Hungarian journalists. The use of convenience sampling introduces further potential bias, as respondents working in church-affiliated or religiously oriented media outlets are markedly over-represented (36.1 %), thereby amplifying the influence of confessional journalistic culture on the findings. Given that data collection concluded in spring 2024, the rapid evolution and increasing normalization of generative AI tools (including ChatGPT, Claude, and domestically developed models may have rendered some of the reported usage patterns and attitudes partially outdated by late 2025. Finally, the study relies exclusively on self-reported data, capturing only declared

perceptions and attitudes rather than observable, actual AI-related practices in journalistic workflows.

Future research could employ comparative cross-national designs to disentangle these cultural moderators from universal technological affordances. Moreover, the anticipated transformations highlighted in this research carry profound implications for journalistic training and ethical governance in Hungary. As AI's role expands in data-driven processes while remaining marginal in interpretive genres, educational curricula at institutions should incorporate hybrid competencies that blend technical literacy with theological-ethical reflection, fostering a precision journalism paradigm adapted to media. Ultimately, this balanced approach may not only alleviate fears of job displacement but also reposition AI as an augmentative ally in sustaining journalistic integrity amid digital disruption, ensuring that technological progress aligns with the value-driven ethos of Hungarian religious journalism.

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