

AI Embedded in News: Innovation of Smart Production on News Ecosystem

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Abstract: In the post-journalism era, the Internet has become the “infrastructure” for the overall operation of human society, and digital technology has been characterized as a “meta-technology” that “has a foundational status and role” in the information age. Intelligent agents influence the news ecosystem by being embedded in news, which is mainly manifested in the automatic generation of content under adversarial games, truth mining and efficiency improvement controlled by model algorithms, and push and dissemination under human-machine collaborative decision-making. Among them, Automatic content generation, including timeliness, programmed news production, news key points, AI drawing, etc. Human intelligence collaboration is to create artificial intelligence tools to embed them into news as news intelligence, improve production efficiency, and reveal facts that are difficult to detect with the naked eye. Machine resource allocation is to use AI's data capture and analysis functions to build models and algorithms, discover and predict public opinion hot spots, and match news topics of concern to the target population.

1. Introduction

On March 18, 2025, the Italian newspaper IL FOGLIO [1] published the world's first newspaper generated by artificial intelligence. The newspaper has the word AI on its masthead. The newspaper consists of 4 pages, in the form of a paper insert, which is inserted into the main newspaper sold on the same day.

The headline of the newspaper is “Because only AI can be optimistic, without flaws or contradictions”, explaining the significance of using AI and the birth of the AI newspaper. The front page also featured reports from US President Trump and Russian President Vladimir Putin. Another report was optimistic about the Italian economy, citing the latest report on income redistribution from the Italian National Statistics Institute. The last page of the newspaper published AI-generated readers' letters, one of which asked whether AI would make humans “useless” in the future? AI replied that AI is a great innovation, but it still cannot accurately order a cup of coffee without making a mistake in the sugar content.

IL FOGLIO's editor-in-chief said this is a news experiment that aims to fully demonstrate the impact of AI technology on work methods and daily life. The newspaper is independently completed by AI from writing, title, introduction to sarcastic words in the article, and the role of the

reporter is limited to “asking questions to AI and reading the answers.” Artificial intelligence and news have once again attracted global attention.

Is AI taking over journalism? Human-computer interaction is reshaping the news ecosystem.

2. Automatic Generation: Computational Generation of New Content in Adversarial Games and Continuous Iterations

By inputting key information or event descriptions, AI technology can be used to quickly generate corresponding multilingual integrated news reports using deep learning, language processing, automatic creation of text, images, audio, video and other capabilities. This application is particularly suitable for time-sensitive and non-deep reports, such as sports news, weather news, and entertainment news reports, to quickly meet readers' needs for timely information. It is also useful for emergencies and emergency reports. Take the Associated Press as an example, it uses artificial intelligence to generate corporate earnings reports, expanding the number of companies it covers from 300 to 4,000. A Stanford University study found that a greater number of companies covered was associated with greater trading activity and market liquidity.

In Reuters, it developed the news generation tool Lynx Insight in 2018, which uses natural language generation technology to automatically generate short stories. And the New York Times created a Valentine's Day message generator using ChatGPT. Users enter a prompt and get an automatically generated love letter. American new media Buzz Feed [2] uses AI for games by creating personality quizzes for users and generating personalized text content based on user responses.

Media is playing an increasingly important role in developing new AI tools. The British Daily Mirror and Daily Express have set up special working groups to study how to use Chat GPT to assist in writing news articles such as traffic and weather forecasts. Reach CEO Jim Mullen said it has set up a working group to study how to effectively use Chat GPT and find creative uses for Chat GPT outside of traditional content areas.

Gannett, a large American media group, adds a summary made by generative AI to each news article and places it in a prominent position below the title. Such summaries, called "key points", are made entirely by AI. At the bottom of the article, it is noted as follows: “This key point at the top was generated with the support of AI and reviewed by reporters before publication.” Since launching Intinya Sih in The Times of Indonesia in October 2023, users' dwell time has increased by 12.5% and feedback has increased by 244.8% [3].

In the 2024 National Two Sessions Special Issue, People's Daily took the lead in using AI drawing in newspapers. The special issue has a total of 4 pages, focusing on themes such as ecological civilization, healthy China, innovation-driven, opening up to the outside world, and cultural prosperity, generating layout backgrounds of different styles. The AI drawing process is that the editor inputs instructions, and AI understands the instructions and calls the algorithm to generate pictures. In the meantime, how to make AI better understand the editor's intentions is the key and difficulty. The full-time “AI prompt engineer” is a new profession created to solve this problem. In the end, the 4 pages are connected. The picture contains both “national tide” elements such as green waters and green mountains, as well as modern scenes such as high-speed rail, 5G, ports, and high-rise buildings, integrating the past and the present, and integrating the inside and the outside, forming a magnificent picture of the times [4].

News GPT [5] is the world's first news website generated entirely by artificial intelligence. It has no journalists, so it claims to be unbiased and provides accurate and reliable information 24 hours a day, 7 days a week. According to Alan Levy, CEO of News GPT, the launch of the platform will change the rules of the game in the news industry. He believes that “the news industry has long

been plagued by bias and subjective reporting, and News GPT will provide viewers with facts and truth.” With the support of technology, News GPT scans news sources from all over the world in real time to create accurate, up-to-date and fair news reports and reports. According to a statement, the website's artificial intelligence algorithm analyzes and interprets data from multiple sources, including social media, news websites, etc.

Marconi, the news AI expert, said that journalists should play a role in developing new AI tools, for example, by writing editing algorithms and applying journalistic principles to new technologies. In fact, the integration of AI into news production has also created new jobs, such as automation and AI editors, computational science reporters, newsroom tool managers, and AI ethics editors.

Artificial Intelligence is Changing the News Ecosystem.

3. Intelligent Agent Embedding: Human Intelligence Collaborates to Improve Efficiency While Revealing Truths that are Invisible to the Naked Eye

Artificial intelligence tools such as news embedding, real-time data response, instant text generation, etc., can enable journalists to gain faster and deeper insights into the news. On the one hand, journalists use artificial intelligence to improve production efficiency; on the other hand, they combine the capabilities of machines with human judgment to reveal facts that are difficult to detect with the naked eye and improve the quality of news reports.

Based on the outline of the event, AI reacts instantly to real-time data. Quarterly reports from large funds used to take weeks to produce by a small team of portfolio managers. Now, artificial intelligence can compile these reports in seconds. According to public reports, as of September 2024, The Paper's “Derivative Everything AI Studio” has helped The Paper's editorial team generate a total of 53,000 AI drawings, 2,569 AI videos, 33,000 AI writings and Q&A, and published hundreds of financial news articles. AI-assisted creation is being deeply used in every aspect of The Paper. On the generative AI platform, new custom general technologies are developed to create custom general tests (GPTs) for various complex documents to simplify the work of investigative journalists.

Through natural language processing, image recognition and multi-modal data fusion, AI can quickly generate high-quality video content. The breakthrough application of this technology has transformed news animation from handmade to algorithm generated, greatly shortening the production cycle and production costs. For example, the Tu Zhi Dao Studio previously produced a 3-minute news animation video, which required 3 art editors to take turns to work for nearly 20 working days to complete. Now, with the support of generative AI, a 3-minute animation video can be completed in only 2 to 3 working days. This improvement in efficiency not only shortens the production cycle, but also significantly improves the efficiency of video dissemination, bringing a faster and more accurate presentation method to news reports.

Embedding intelligent agents in news plays an important role in mining data to reveal truths that journalists cannot see with their naked eyes. Reuters is one of the largest news providers. It has partnered with Graphiq [6] to provide faster access to data and once the data is embedded in a news story, the visualizations are updated in real time. Lynx Insights helps journalists analyze data, come up with story ideas, and write content. It is committed to discovering the truth in a world full of opinions, misinformation, and false information.

As part of its Cybernetic Newsroom initiative, Lynx Insight aims to combine machine capabilities with human judgment to improve the quality of news reporting. Lynx Insight augments human news reporting by identifying trends, anomalies, key facts, and suggesting new stories for journalists to write. The platform combines large-scale automated data screening with algorithms written by Reuters journalists to go beyond simple mechanical reporting and proactively provide

new data-based perspectives that employees can access. The tool helps Reuters journalists with market reporting: Lynx Insight searches for newsworthy content from massive amounts of structured financial data. It analyzes market data, such as patterns in stock prices, earnings and revenue forecasts, and presents valuable information to Reuters journalists. Journalists then create original news and insights, digging out more meaningful content from a sea of facts. It is a perfect example of how artificial intelligence can enhance human intelligence [7].

Lynx Insights' approach is that technology experts develop AI technology, train machine learning systems with data, develop search and question-answering systems, and create deep learning modules. Domain experts provide industry context. Westlaw Edge is a tool for finding, understanding, and verifying law, especially for complex issues. It is reliable and comprehensive. This is due to its editorial process that combines editorial annotations, classification, and attorney corrections to ensure that rapidly changing laws are kept up to date, using machine learning to enhance search and text similarity.

ONESOURCE is a tool that enhances tax professionals in fulfilling complex tax and trade compliance and reporting obligations. For example, the global trade management solution can provide predictive mapping capabilities to provide users with suggestions on how to map new accounts to the chart of accounts; in addition, it also provides AI-driven capabilities in the indirect tax solution to cope with complex and important product classification tasks.

At Reach [8], Auto Image Maker, expands audiences and drives performance through creative automation. The software can generate images of any aspect ratio in less than two seconds, with brand-style captions attached. It solves the problem of how to reach audiences when the rules of engagement on major platforms change at any time. Reach's social media team tried replacing traditional image links with links in comments and increased engagement through RSS feed publishing automation, which increased click-through rates. The Image Maker tool was created to make the image editing process smoother and more seamless than doing it manually thousands of times a day. During the trial, Manchester Evening News saw an 85% increase in engagement on its Manchester United Facebook page, a 100% increase in average post engagement, and a 233% increase in average post reach. After six weeks of trialing, page views increased by 215% compared to before.

Philippine journalist Jaemark Tordecilla spent about 16 hours creating an AI tool, COA Beat Assistant, to help investigative journalists find news in audit reports. His approach was to use custom GPTs and set parameters, which significantly shortened research time and enabled journalists to easily discover important news. Jaemark Tordecilla pointed out that in addition to audit reports, similar tools can be developed to help newsrooms and journalists deal with corporate financial statements and annual reports, legal documents such as court decisions and case files, environmental impact assessment reports, etc., as well as public policy documents, legislative texts, procurement and contract documents and other types of documents.

Geo AI continues to revolutionize investigative journalism. It combines geospatial data, artificial intelligence, satellite imagery, and more to reshape the way investigative journalists uncover hidden stories. The 2024 Pulitzer Prize for Investigative Reporting uses satellite imagery to reveal key insights and truths that are invisible to the naked eye. FlyPix.ai is at the forefront of this change. It makes earth observation data more accessible, actionable, and impactful. FlyPix.ai will work with media partners to explore innovative ways to use Geo AI in storytelling, investigations, and public interest reporting.

The introduction of custom, general-purpose technology could be a game-changer for newsrooms, eliminating the need for critical thinking, just finding the right information and summarizing it.

4. Machine Allocation of Resources: predicting Hot Spots and Accurately Matching User references and Value Orientations

The machine's decision-making ability in allocating resources enables it to excel in task scheduling, time scheduling, preference customization, etc [9]. Using AI's data capture and analysis functions, we can quickly plan news topics and accurately distribute information to different audiences. By analyzing and mining a large amount of data on target populations and regions, we build models and algorithms to discover and predict public opinion hotspots and match news topics of concern to the target population. At the same time, we use language analysis and sentiment analysis techniques to label users with reading preferences, value orientations, and other labels, and report on the corresponding content and style. TikTok's parent company Byte Dance's recommendation algorithm “Lingju” achieves accurate push of content and advertising by summarizing and analyzing the basic characteristics and behavioral data of platform users.

One of the experiences of the Financial Times in integrated development is to cover data application and data exchange in the daily management of the editorial department, and to realize intelligent management in data analysis, reader development, and reader analysis.

For example, the Financial Times has established an Engagement Rate for the number of clicks, readings, and forwardings of digital newspapers by readers, so as to understand the user stickiness of the reader group to the Financial Times.

The Nihon Keizai Shimbun has also established the Page View indicator in the digital media management, which is mainly used to analyze the satisfaction of paid members. By intelligently detecting the PV value of paid members, it can understand whether readers are interested in the pushed news, so as to maintain the company's profitability. In order to further improve the conversion rate of digital subscribers, the Nihon Keizai Shimbun has established an SEO optimization guide to ensure the standardization of news content retrieval. The newspaper uses the visual analysis platform Tableau to monitor the activity of subscribers and the conversion rate from free users to subscribers, actively track the reading content and reading interests of different user groups, and implement precise and intelligent news push, effectively reducing the churn rate. In addition, the newspaper uses the news service to provide targeted push services to subscribers, and uses visual data and virtual reality technology to improve the reading experience of digital users.

Social video is exploding. As audiences increasingly embrace the short-form video format, more media outlets are bringing this type of content to their sites and apps. Some outlets, such as The Economist and the BBC, have built-in video carousels into their homepages, while others are embedding vertical videos in their stories or commissioning journalists to produce talk shows.

Discovering and predicting hot topics, matching user preferences and value orientations, and achieving precise push notifications through index settings have promoted the reshaping of the news ecosystem in the post-news era.

5. Conclusion

In the post-journalism era, artificial intelligence is rapidly changing the news ecosystem. The AI practice of the Italian newspaper IL FOGLIO has caused another shock in the news industry. Has AI taken over the news industry? From the current AI practice, the news practice of AI is mainly manifested in three aspects: The first is automatic content generation, including the use of deep learning, language processing and other technologies to automatically produce news with strong timeliness, and the use of artificial intelligence to increase the amount of reports, refine news points, and draw pictures. News media people will play a greater role in developing new AI tools. The second is human-intelligence collaboration. By creating artificial intelligence tools, it can be used as a news embedding to respond to real-time data in a timely manner. The result is not only to improve

production efficiency, but also to combine machine capabilities with human judgment to reveal facts that are difficult to detect with the naked eye and improve the quality of news reports. The third is to realize machine allocation of resources, use AI's data capture and analysis functions, build models and algorithms, discover and predict public opinion hotspots, and match the news topics of concern to the target population. At the same time, using language analysis and sentiment analysis technology, users are labeled with reading preferences, value orientations, etc., and corresponding content and style reports are carried out. This machine's decision-making ability in allocating resources enables it to excel in task scheduling, time scheduling, preference customization, etc.

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