



# THE ROLE OF ARTIFICIAL INTELLIGENCE IN AUTOMATED JOURNALISM: TRANSFORMING NEWS PRODUCTION

Shivani Tiwari,

Student

Journalism and Mass communication  
Amity University, Noida, India

**Abstract:** This study examines the prevalence and impact of AI adoption in Indian media organizations, focusing on AI-generated content's influence on journalistic practices and its implications for journalists and audiences. Leveraging a comprehensive review of literature, case studies of Indian media organizations, and content analysis of AI-generated news, this research evaluates the quality and accuracy of automated journalism. It also explores ethical and social implications and conducts a comparative analysis of global trends. The methodology integrates secondary data from reputable sources and primary data through a survey assessing reader perceptions of AI vs. human-generated news. Key hypotheses include the enhancement of news speed and accuracy through AI, the lack of emotional perspective in automated journalism, and potential algorithmic biases. Findings from this study will provide crucial insights for media organizations, policymakers, and society regarding AI's evolving role in journalism in India.

**Key Words -** *Artificial Intelligence, Automated Journalism, News Generation, Indian Media, Global Media Trends*

## I. INTRODUCTION

In today's fast-paced world, staying abreast of current events often involves scrolling through news notifications on mobile devices. It is common to encounter headlines heralding advancements in artificial intelligence (AI) technology, whether it is Google's latest innovation or IBM's strides in the AI landscape. These developments can evoke a mix of curiosity and apprehension—excitement about the potential benefits of new technologies like ChatGPT, alongside concerns about understanding the implications of the data consumed.

Indeed, the nature of news itself is evolving, Automation technologies, notably intelligent automation and machine learning, are fundamentally altering journalism by revolutionizing both processes and practices (Oracle.com, 2024). AI increasingly playing a pivotal role in news Production. Automated journalism, also known as algorithmic journalism or robot journalism, is a process where software or algorithms generate news stories without

human intervention, once they have been programmed initially. This phenomenon, aptly named Artificial Journalism (AJ), is reshaping the landscape of news delivery. (Loosen, 2018)

Business Process Automation (BPA), a cornerstone of process automation, is now integral to digital transformation strategies in various sectors (SAP, 2023). Intelligent automation, powered by advanced AI and machine learning, facilitates continuous learning and data-driven decision-making, improving efficiency and user experience (IBM, 2019). In journalism, automated journalism driven by AI algorithms and structured data finds applications in content production, data mining, and news dissemination (Veglis, Andreas, June 2021). This shift towards automation affects journalistic practices, enabling personalized news delivery, metrics-based decision-making, and enhancing investigative journalism through AI (Ali, Hassoun, 2019). Nevertheless, challenges like transparency, bias, and the future role of human journalists persist, demanding a balanced approach that upholds ethical standards while leveraging the transformative potential of automation (OCI, 2023).

Platforms like Inshort in India exemplify the rapid dissemination of news, often delivering updates within mere minutes of events unfolding. This agility is made possible by AI algorithms parsing through vast amounts of data, extracting key information, and crafting concise news pieces.

Gone are the days of waiting for journalists to file reports from war zones or protest areas—a reality that not only speeds up information dissemination but also minimizes the risks to reporters on the ground. (AP, 2014)

In recent years, there has been a surge in the utilization of chatbots for news distribution, particularly by public service media organizations such as the BBC and Australian Broadcasting Corporation (ABC) (Thurman & Kunert, 2019). These organizations are responding to shifts in social media usage towards more private platforms like WhatsApp and Facebook Messenger, aiming to reach audiences where they are (Thurman & Kunert, 2019). Studies on the ABC's "newsbot" have shown positive user responses to its informal style and information control, although concerns have been raised regarding reliance on private platforms like Facebook (Ford & Hutchinson, 2019). Similarly, the BBC's newsbots are recognized for efforts to engage underserved audiences, particularly the youth, yet empirical evidence on the success of these strategies remains limited (Jones & Jones, 2019).

However, amidst the convenience and efficiency of AI-driven journalism, questions arise about the nuances of this data-driven approach. While AI can swiftly compile and present information, it lacks the human touch and editorial discretion that traditional journalism entails. The absence of human oversight raises concerns about journalistic ethics, accuracy, and bias in AI-generated content. (AP, 2014)

As we navigate this era of AI-driven journalism, it is imperative to strike a balance between leveraging technological advancements for rapid news delivery and upholding the principles of responsible journalism. The integration of AI in newsrooms undoubtedly presents opportunities for innovation, but it also underscores the importance of critically evaluating the sources and methods behind the news we consume.

## CHAPTER 2: REVIEW OF LITERATURE

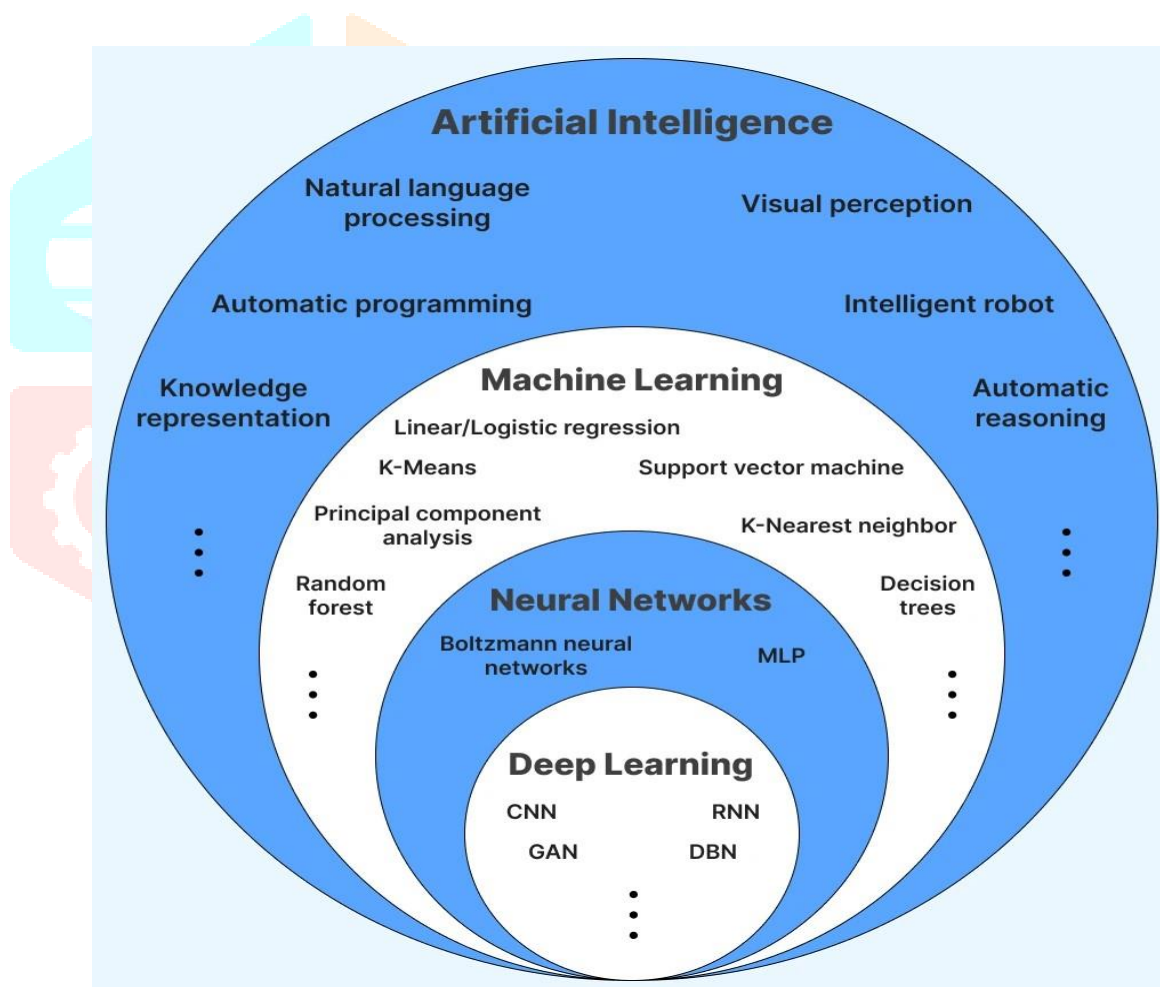
### 1. Defining Artificial Intelligence

Artificial Intelligence (AI) serves as a technology that empowers computers and machines to mimic human intelligence and problem-solving abilities. (IBM,2024). It embodies the remarkable capability of machines to undertake cognitive functions that have long been associated with human intelligence. These functions encompass a broad spectrum of activities, ranging from the perception of sensory inputs to the complex processes of reasoning, learning, and problem-solving. AI facilitates interaction with the environment, enabling machines to adapt and respond intelligently to dynamic situations. Moreover, AI systems have demonstrated a capacity for creativity, breaking new ground in fields traditionally deemed exclusive to human endeavor. (McKinsey & Company, 2023)

When integrated either independently or alongside other technologies such as sensors, geolocation, or robotics, AI becomes capable of executing tasks that would typically necessitate human intervention. (IBM,2024). These tasks include speech recognition, decision-making, and pattern identification. Under the AI umbrella, various technologies such as machine learning, deep learning, and natural language processing (NLP) find their place. However, there exists a debate regarding whether the technologies currently labeled as AI truly embody artificial intelligence. Some argue that what we witness today is advanced machine learning, a precursor to achieving true artificial intelligence, or what is termed "general artificial intelligence" (GAI). (Coursera, 2023).

AI permeates our daily lives, making frequent appearances in news headlines and taking various forms, from digital assistants and GPS guidance to autonomous vehicles and generative AI tools like OpenAI's ChatGPT. These applications vividly demonstrate AI's profound impact on modern society. (IBM,2024). Within the realm of computer science, artificial intelligence often intersects with and is discussed in tandem with machine learning and deep learning. These disciplines entail the development of AI algorithms inspired by the decision-making mechanisms of the human brain. Such algorithms can "learn" from available data, progressively enhancing their ability to classify information accurately or make predictions with increasing precision over time. (IBM, 2024).

Artificial intelligence has experienced numerous waves of hype, yet the emergence of ChatGPT appears to signal a significant turning point. While previous breakthroughs primarily focused on computer vision, the latest leap forward resides in natural language processing (NLP). Presently, generative AI demonstrates the capacity to learn and synthesize not only human language but also various other data types, including images, video, software code, and molecular structures. The applications of AI are expanding rapidly. However, as excitement around the integration of AI tools in business intensifies, discussions concerning AI ethics and responsible AI practices become increasingly crucial. (IBM, 2024).



(Source: lambdatest.com)

## 1.1 History of Artificial Intelligence

The history of artificial intelligence (AI) is a journey marked by significant milestones that have shaped its evolution. Beginning with Alan Turing's seminal question in 1950, "Can machines think?" and the introduction of the Turing Test, the foundation for AI exploration was laid. In 1956, John McCarthy coined the term "artificial intelligence" and unveiled the Logic Theorist, the first operational AI program. The 1967 development of the Mark 1 Perceptron by Frank Rosenblatt demonstrated early neural network learning. Advancements continued in the 1980s with the widespread adoption of neural networks using backpropagation. The 1990s saw the publication of "Artificial Intelligence: A Modern Approach" by Stuart Russell and Peter Norvig, a landmark text in AI studies. Milestone victories followed, such as IBM's Deep Blue defeating chess champion Garry Kasparov in 1997 and DeepMind's AlphaGo triumph over Go champion Lee Sedol in 2016. By 2023, the advent of large language models like ChatGPT signified a paradigm shift, unleashing AI's transformative potential across industries, promising unprecedented value creation. (IBM, 2024). The pragmatic approach of the Turing Test facilitated the evaluation of machines' ability to replicate human responses. (Maad, 2015)

## 1.2 Weak Vs. Strong Artificial Intelligent

We often hear about two main types of artificial intelligence (AI): weak AI and strong AI. Weak AI, also called narrow AI or artificial narrow intelligence (ANI), is all around us in our daily lives. It's what powers things like Apple's Siri, Amazon's Alexa, IBM Watson, and self-driving cars. Despite being called "weak," this type of AI is actually pretty impressive, as it handles specific tasks really well and makes our lives easier. (Wells III, 2023)

On the other hand, strong AI is a bit more ambitious. It includes two categories: artificial general intelligence (AGI) and artificial superintelligence (ASI). AGI, also known as general AI, is like the holy grail of AI. It's where machines would be as smart as humans, with abilities like problem-solving, learning, and even consciousness. ASI takes things even further, surpassing human intelligence entirely. While strong AI is mostly theoretical for now, researchers are still

working hard to make it a reality. You might have seen examples of ASI in movies and books, like HAL from "2001: A Space Odyssey." (IBM, 2024).

## 2. Defining Automation and Artificial Intelligent

Automation is all about using technology to do tasks with less need for humans to be directly involved. It's like having machines take over parts of a process to make things faster, more reliable, and more efficient. This idea is used in many different areas, like manufacturing, transportation, utilities, defense, and even things like accounting and IT. (Margaret Rouse, 2024)

### 2.1 Different Approaches to Automation

In the business world, there are a couple of common ways we talk about automation. One is called business process automation (BPA), which is basically using automation principles to make business processes run smoother. Another one is robotic process automation (RPA), which focuses more on automating specific tasks that are repetitive. Sometimes in IT marketing, you might hear about something called hyperautomation. This term is used to talk about more advanced automation solutions that use things like artificial intelligence and deep learning, compared to simpler rule-based systems. (Margaret Rouse, 2024)

### 2.2 Examples of Automation in Everyday Life

**Home Automation:** This is all about using technology to control and manage household appliances and devices. Think of things like smart thermostats, lights you can control with your phone, or even robot vacuum cleaners. (Margaret Rouse, 2024)

**Network Automation:** This involves automating the setup, management, and operation of computer networks. It's like having software that helps make sure your Wi-Fi works smoothly and efficiently. (Margaret Rouse, 2024)

**Office Automation:** In the office, automation means using computers and software to handle tasks like storing documents, processing data, and communicating. It's about making officework more efficient and organized. (Margaret Rouse, 2024)



**Automated Website Testing:** This is about making sure websites work correctly before they're launched. Instead of manually testing every little change, automation tools help streamline the process by running tests automatically. (Margaret Rouse, 2024)

**Data Center Automation:** Data centers are where lots of computer servers are stored and managed. Automation here means using software to handle most of the tasks involved, like managing server configurations and even running operations without needing people on-site. (Margaret Rouse, 2024)

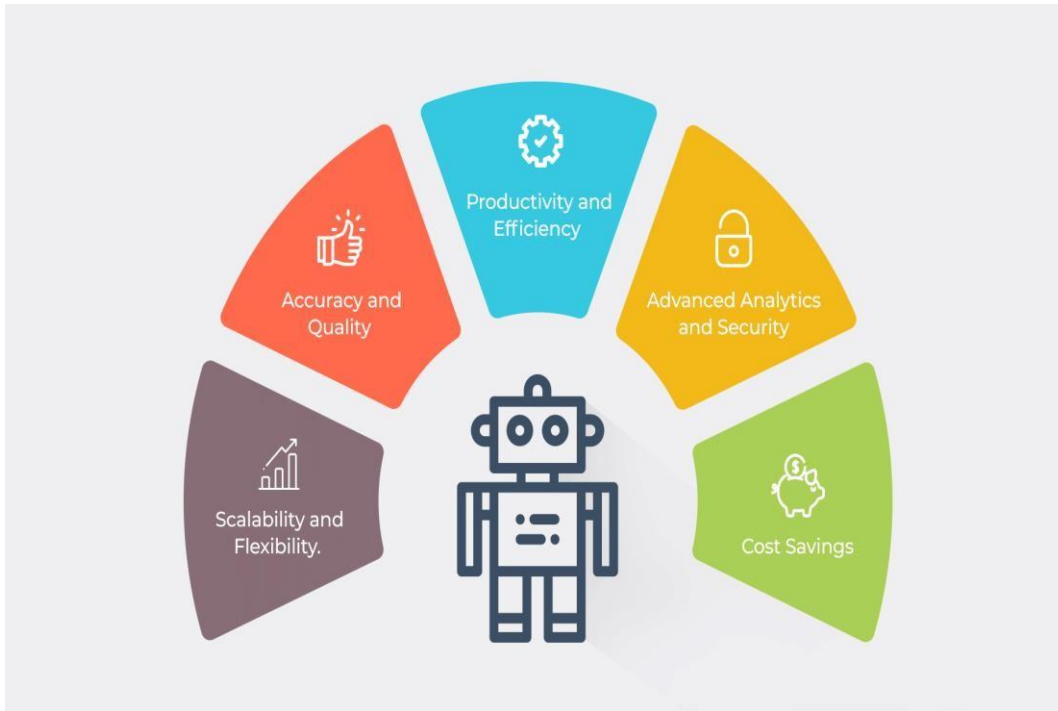
**Test Automation:** This involves automatically running tests on software to check if it works properly. Instead of people having to do it manually, scripts and other tools are used to run tests automatically during quality assurance (QA) testing. (Margaret Rouse, 2024)

### 2.3 Forms of Automation

Automation comes in different forms, each with its unique purpose in organizational workflows. (IBM, 2024)

**Foundational Automation (Task Automation):** This type of automation simplifies and centralizes routine tasks by digitizing work processes. It aims to boost efficiency, minimize errors, and free up human resources for more valuable tasks. Tools like Robotic Process Automation (RPA) are often used for this purpose. (IBM, 2024)

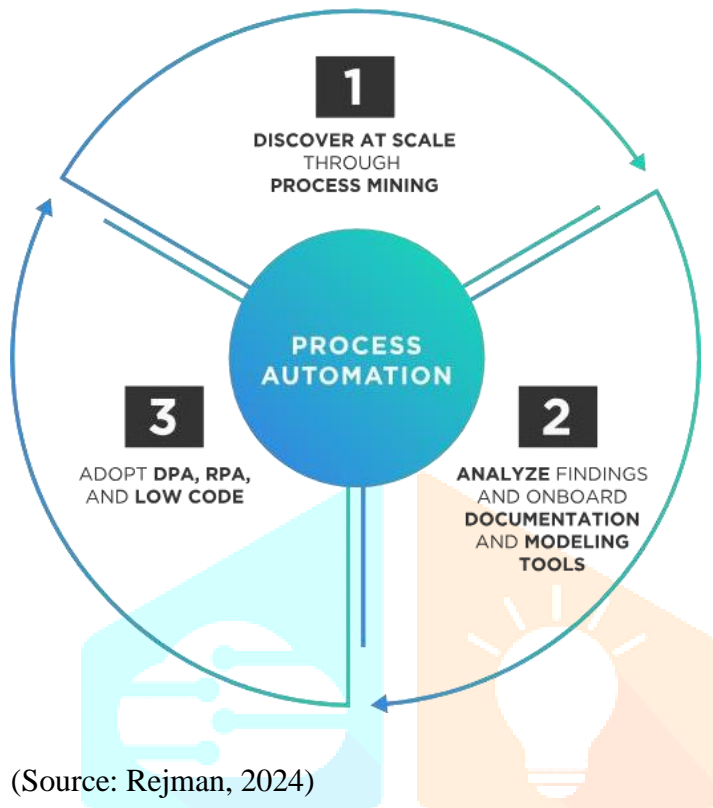
**Robotic Process Automation (RPA):** RPA employs pre-programmed "bots" to automate repetitive, rule-based tasks. It's great for saving time and enhancing operational efficiency. RPA tools like UiPath and Automation Anywhere are widely used for this purpose. (MALAK, 2023)



(Source: IT Convergence, 2019)

**Process Automation:** Process automation tackles complex, multi-step procedures by integrating with various systems. It ensures consistency and transparency across business and IT processes, boosting productivity and offering insights through rules-based decision-making. Examples include process mining and workflow automation. (Rejman, 2024)



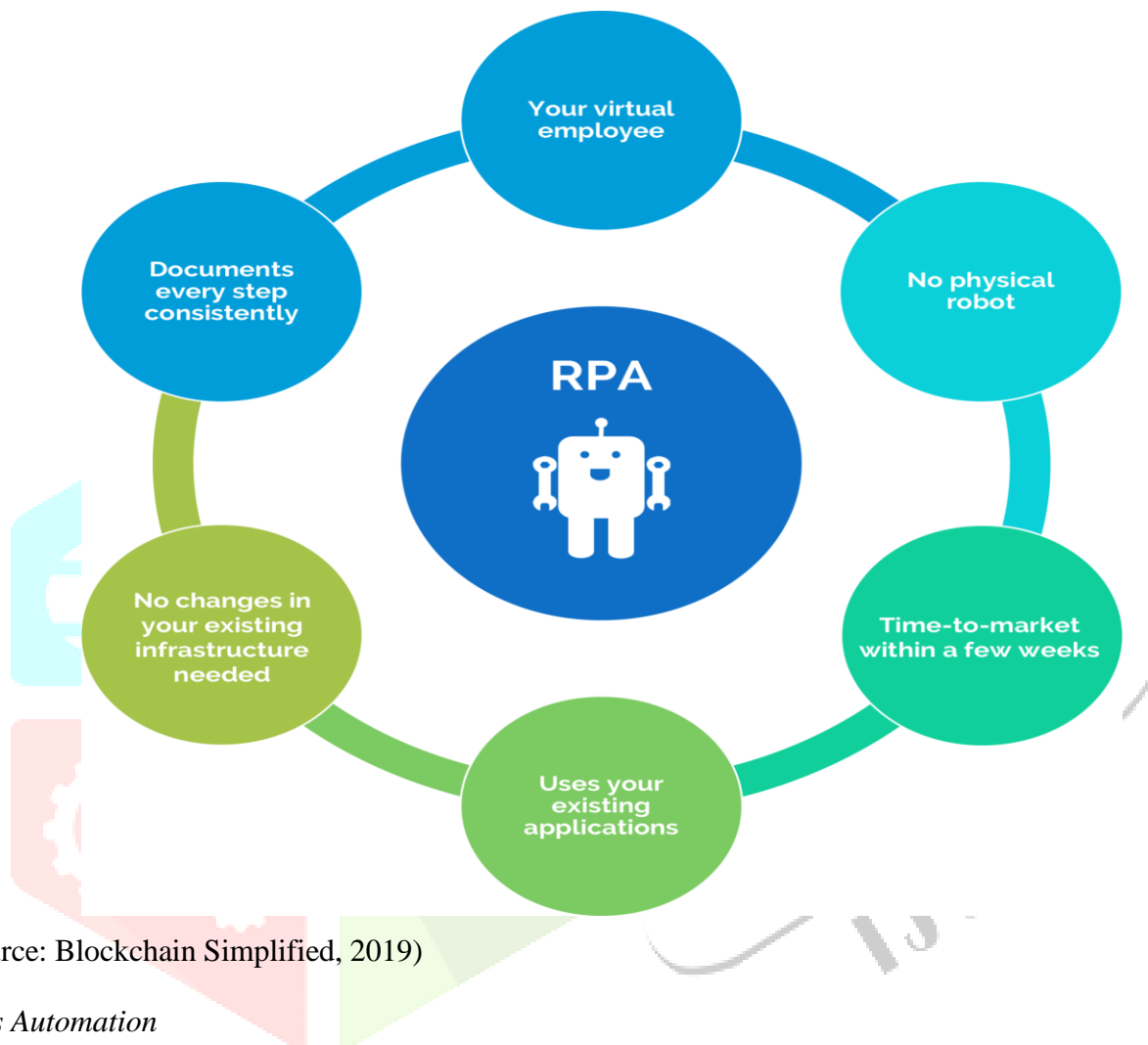


#### 2.4 Key Differences Between RPA and Process Automation

RPA, or Robotic Process Automation, employs "robots" programmed to mimic human actions, interfacing with system interfaces to execute various business processes. These robots interpret, integrate, and communicate with multiple systems to streamline day-to-day functions. Unlike machine learning and artificial intelligence, RPA operates based on predefined business rules. It follows these rules meticulously to automate manual processes without the ability to analyze patterns or contextual cues. Instead, its focus is on efficiently executing specific tasks according to the established rules. (Blockchain Simplified, 2019).

While RPA focuses on automating front-end tasks mimicking human work processes, process automation has a broader scope, involving machinery, software, data systems, and

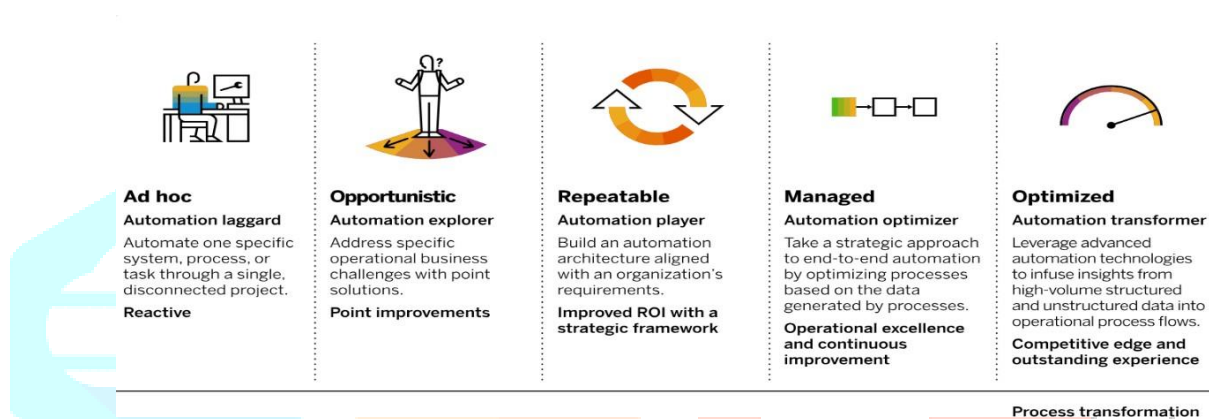
integration activities. RPA commonly targets tasks like email responses and data extraction.(Blockchain Simplified, 2019).



#### 2.4.1 Process Automation

Process automation utilizes software and technology to streamline business operations, achieving specific organizational goals spanning product manufacturing, employee onboarding, and customer service delivery. Initially, Business Process Automation (BPA) emerged within the realm of Business Process Management (BPM), primarily targeting enhanced back-end efficiency through the automation of repetitive tasks. However, BPA has since evolved into the driving force behind BPM, emerging as a critical element in digital transformation endeavors. (SAP, 2023)

In contemporary contexts, BPA, bolstered by advancements in AI and machine learning, assumes a central role in digital transformation strategies. Its capabilities extend beyond back-end processes, now integrating with front-end applications to optimize operations across diverse sectors including supply chain, human resources, finance, and customer service. (SAP, 2023). Process automation encompasses a wide array of tasks including managing data files and automating repetitive tasks. (TIBCO).



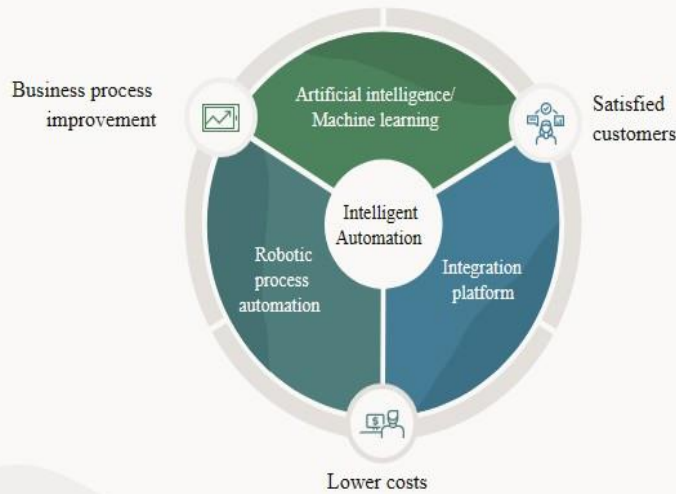
(Source: SAP, 2023)

## 2.5 Understanding Intelligent Automation

At the top tier of automation sits intelligent automation, a fusion of automation with advanced AI and ML capabilities. This sophisticated level enables machines to continuously learn from past experiences, improving decision-making and taking actions based on analyzed data. An example of this is AI-powered virtual assistants in customer service, which not only optimize costs but also enhance the overall customer experience. AIOps and AI assistants, often referred to as digital workers, embody this cutting-edge form of automation. (IBM, 2019)

Intelligent automation, also known as cognitive automation, harnesses a blend of automation technologies, including artificial intelligence (AI), business process management (BPM), and robotic process automation (RPA), to enhance decision-making processes across organizations. This approach aims to streamline workflows and improve efficiency by leveraging AI capabilities to make smarter decisions and automate complex tasks. (IBM, 2019)

## What Is Intelligent Automation (IA)?



(Source: OCI, 2023)

Intelligent automation merges various technological elements such as integration, process automation, AI services, and RPA technologies to streamline repetitive tasks and enhance human decision-making. Within this domain, components like NLP, ML, cognitive automation, computer vision, intelligent character recognition, and process mining play crucial roles. AI involves training machines to emulate human intelligence, while iPaaS enables seamless connectivity between different systems in the cloud. RPA utilizes software bots for precise and speedy execution of repetitive tasks, and NLP enables machines to understand human language for interaction purposes. ML facilitates learning from data without explicit programming, while cognitive automation combines AI and RPA for complex decision-making. Computer vision enables visual data interpretation, and intelligent character recognition allows machines to decipher text efficiently. Lastly, process mining leverages AI and data mining to optimize business processes. Together, these components drive the advancement of intelligent automation, reshaping organizational workflows and decision-making processes. (Oracle.com, 2024).

### 3. UNDERSTANDING AUTOMATED JOURNALISM

The terms "automated news" and "automated journalism" can have various interpretations, depending on whether they are broadly or narrowly defined. In a general sense, automation in journalism encompasses any process or system of news production controlled by mechanical or electronic devices, with minimal external influence. When specifically considered within the realm of digital journalism, automation more narrowly refers to processes enabled by Artificial Intelligence (AI), involving structured data and algorithms capable of making inferences.

As outlined by Marconi, Siegman, and Machine Journalist (2017), these AI-related advancements empower journalists to analyze data, identify patterns, glean actionable insights, visualize imperceptible details, convert data and spoken words into text, and understand sentiment, among other capabilities.

In this context, the exploration of automated journalism aligns with a broader interest in "computational journalism" (Cohen, Hamilton, and Turner 2011), "algorithmic journalism" (Anderson 2011), and "automated media" (Napoli 2014). Specifically, within journalism studies, automated journalism, as consistently described following Carlson's (2015) influential characterization, refers to the automatic transformation of structured data into narrative news accounts—essentially, "software-generated news" (Linden 2017a).

The predominant technologies within this realm of journalism research are writing programs, exemplified by Automated Insights' Wordsmith. While other technologies, such as chatbots engaging in direct exchanges with readers about news subjects, also exist (Barot 2015), their utilization and study within journalism have been comparatively limited. For this reason, the primary focus in this discussion is on news-writing programs (Carlson 2015).

Automated journalism, also known as algorithmic or robot journalism, represents a fusion of modern technology and journalistic practice. It involves the generation of news articles through computer programs rather than human intervention. (Andreas, 2016). This innovation spans across four key areas: automated content production, data mining, news dissemination, and content optimization. (Veglis, Andreas June 2021).

The prevalence of quantitative approaches in modern journalism has become increasingly prominent. Despite its relatively recent emergence, these innovative forms of journalism have

garnered significant attention within academic circles and have recently become a focal point of interest in the media sector. (Ali, Hassoun 2019).

Loosen (2018) sheds light on four distinct forms of journalism that signify a transformative process not only in the fundamental stages of news creation and consumption but also at the very core of journalistic practices. This transformation underscores a noteworthy shift in how journalism operates today, emphasizing a quantitative turn that permeates various aspects of news production and audience engagement.

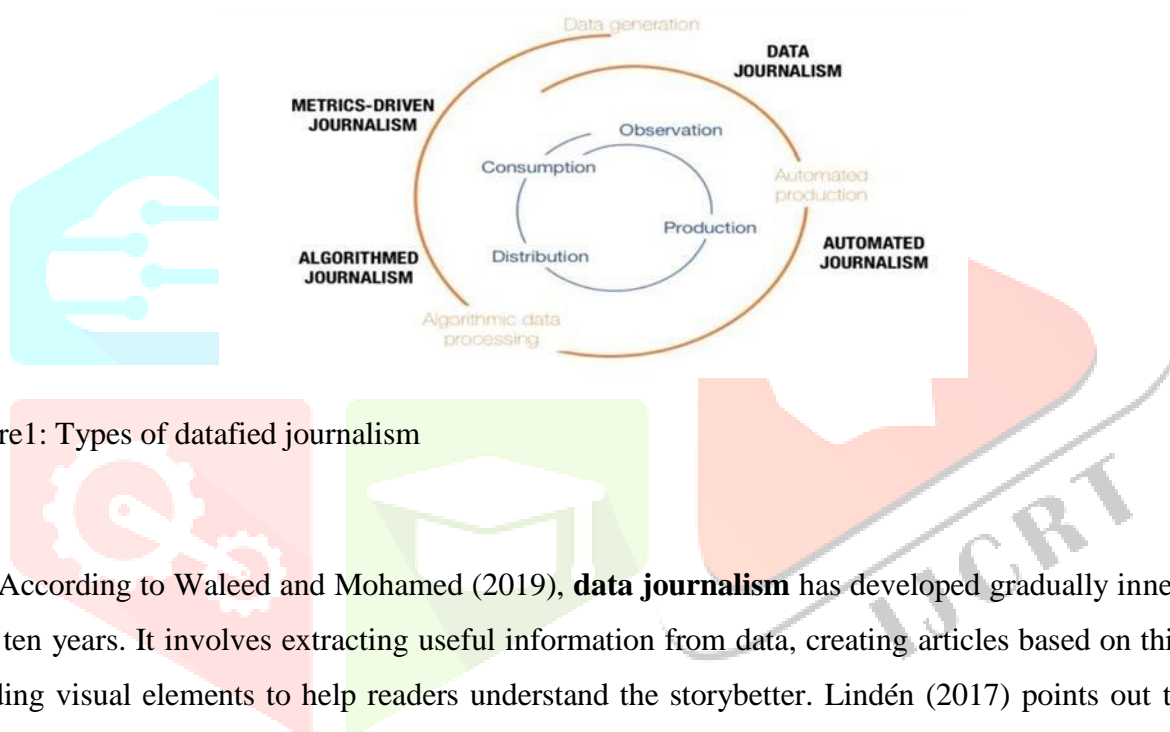


Figure1: Types of datafied journalism

According to Waleed and Mohamed (2019), **data journalism** has developed gradually in newsrooms over the last ten years. It involves extracting useful information from data, creating articles based on this information, and adding visual elements to help readers understand the story better. Lindén (2017) points out that the digital revolution has made more data available for computational journalistic processes, leading to increased expectations for covering events. This type of journalism combines different areas like investigative research, statistics, design, and programming, showing how diverse fields are coming together in journalism.

**Algorithm journalism**, as defined by Diakopoulos (2019), involves applying algorithms to both produce journalistic content like articles and present news to audiences through personalized recommendations and curation. This broad scope, further explored by Singer et al. (2020), encompasses tasks like automated writing, data analysis, and even fact-checking (Lewis,



2014). While promising in efficiency and reach, concerns remain about transparency, bias, and the future of human involvement in news creation.

**Automated journalism**, or "robot journalism" as Carlson (2015) coined it, harnesses technology to write stories on autopilot: Algorithms churn out articles and reports from data or pre-set templates (Thurman et al., 2022). Simplify newsgathering: Tasks like data analysis, news aggregation, and delivery are automated (Diakopoulos, 2019). Reduce human involvement: Machines handle much of the news cycle, freeing journalists for deeper analyses (Lewis, 2014).

**Metrics-driven journalism** is a transformative approach in news production, integrating audience data throughout the workflow. It utilizes digital interactions, such as clicks and shares, to inform decisions, aiming to quantify engagement and enhance the overall news experience (Wu, 2017). Key principles include embedding data analysis in all stages, prioritizing reader interest metrics, using insights for decision-making, and employing algorithms for personalized curation. While promising increased engagement, it raises concerns about data bias, prioritizing clicks over quality, and overlooking marginalized voices. Responsible navigation of these challenges is crucial, emphasizing journalistic ethics, diverse data sources, and a commitment to quality journalism over sensationalized content. Shoemaker & Vos (2015).

### 3.1 Machine Learning in News Production

Machine learning, regarded as the most prominent, involves teaching computers to enhance their performance based on prior experiences (Russell and Norvig 2021). This application has proven cost-effective, particularly in industries like news (Castro and New 2016).

The integration of artificial intelligence (AI) and machine learning technologies has become increasingly prevalent in the field of journalism. These technologies offer a wide range of applications that enhance traditional reporting practices. For instance, AI enables emotion recognition through facial analysis, sentiment analysis of news content, and predictive modeling for various outcomes, including election results.

Machine learning intersects with deep learning and predictive analytics. Deep learning employs statistical techniques to enable computers to comprehend extensive datasets, emulating the cognitive processes of the human brain (Hassaballah and Awad 2020). Predictive analytics, a subset of machine learning, entails forecasting future outcomes using historical data (Russell and Norvig 2021).

Computer vision, another pivotal area, empowers computers to derive meaningful information from digital images, encompassing both image recognition and machine vision (Szeliski 2011). The latter refers to a computer's ability to interpret its environment.

Not all news bots are super high-tech with things like machine learning or language skills. Instead, they follow a set of steps (planning) and know when to do them (scheduling) to post messages. Researchers have put news bots into four groups: where they get info, how they create content, the rules they follow, and what they're meant for (Lokot and Diakopoulos 2016).

In Brazil, newsrooms really like using Twitter bots with special computer features, especially in language stuff, machine learning, and planning. These bots handle big piles of data and actively join in on digital platforms (DalBen and Jurno 2021). Sadly, some bots have been used in a bad way in events like the 2016 US elections and the Brexit campaign (Bastos and Mercea 2018).

Famous news outlets like The New York Times, The Washington Post, and Associated Press have added smart computer projects into their newsrooms (Chan-Olmsted 2019). But, even for these big names, using this technology costs a lot (Broussard et al. 2019). Also, cool models like GPT-3, introduced in 2020, show how text machines are getting better. GPT-3 can do lots of things like writing, translating, summarizing, and predicting, using less computer power (Brown Gage 2020). But there's a worry that it might create twisted content, which could mislead people.

Speech recognition transforms spoken language into written text, commonly used in applications relying on voice commands (Deloitte 2014). Natural language processing (NLP) takes this a step further, enabling computers to understand and respond to text or voice data, including tasks like translation and information extraction (Castro and New 2016).

Within NLP, natural language generation (NLG) crafts structured data into coherent sentences, while natural language understanding (NLU) interprets unstructured data into comprehensible information (Locker 2019).

An illustrative example is the collaboration between Imani and Quartz journalist Sarah Slobin in January 2017. They utilized machine learning techniques to augment traditional reporting on U.S. President Donald Trump's inaugural speech. Their approach involved analyzing Trump's facial expressions during both his acceptance and inauguration speeches to discern the underlying emotions conveyed. Imani's algorithm was specifically trained to identify subtle micro-expressions, such as raised eyebrows indicating surprise, and correlate them with predefined emotions. This demonstrates how machine learning enhances journalists' ability to uncover deeper insights and provide richer context in their reporting. (Locker 2019).

### 3.2 Current Uses of Automated Journalism in Global Media

In recent times, chatbots, commonly used in customer service, are gaining traction as a means of distributing news. Public service media organizations like the BBC and Australian Broadcasting Corporation (ABC) are exploring chatbot deployment due to shifts in social media usage, moving towards more private platforms like WhatsApp and Facebook Messenger. This change is driven by the need for public service media to make news available on diverse platforms (Thurman, Seth C, Kunert, 2019).

Ford and Hutchinson (2019) studied the ABC's "newsbot," finding positive responses from users who appreciate its informal style and control over information. However, concerns were raised about relying on private platforms like Facebook. Jones and Jones (2019) conducted a qualitative study on BBC's newsbots, highlighting their efforts to reach underserved audiences, especially the youth. Despite positive intentions, limited empirical evidence exists on the success of these strategies. Both articles emphasize the challenges posed by third-party involvement in hosting newsbots, prompting the BBC to develop strategies to uphold public service values (Ford and Hutchinson, 2019; Jones and Jones, 2019).

Ford and Hutchinson(2019), as well as Jones and Jones, highlight how chatbots can make news feel more personal in tone and content. Personalizing news has a long history, and Bodo's study on European news outlets distinguishes between personalization by platforms like Facebook and by publishers. Platforms use vast user data to maximize engagement for advertising without editorial oversight, while publishers personalize to sell subscriptions or showcase public subsidies, aiming to cultivate interest in quality information.

Helberger's (2019) article explores the democratic implications of news recommenders, proposing a framework based on liberal, participatory, and deliberative theories. She argues that recommender systems on social media platforms prioritize individual interests but lack transparency. Those promoting participatory democracy focus more on broader societal interests, while deliberative recommenders prioritize exposing users to diverse views and fostering discourse. Helberger emphasizes that the impact of recommender systems on democracy depends on the values they embody.

Stray's (2019) article shifts focus to investigative journalism, examining the role of AI in journalism's watchdog function. Despite hopes for transformative effects, Stray finds that AI's use in investigative journalism has been limited due to challenges in data acquisition, accuracy requirements, technology limitations, and difficulties in codifying news values. However, he identifies potential opportunities for AI in extracting data from documents and revealing hidden relationships in databases.

Caswell (2019) discusses the potential of computational journalism, emphasizing that it is still an unfinished project. He argues that the current development of computational approaches to news lacks a comprehensive framework, making the field ill-prepared to influence journalism's adaptation to a technologically mediated future.

#### 4. ARTIFICIAL INTELLIGENCE AND THE FUTURE OF JOURNALISM

In "Newsmakers," Francesco Marconi, a journalist and R&D chief at the Wall Street Journal, delves into the ramifications of Artificial Intelligence (AI) on contemporary journalism. Addressing pivotal queries surrounding AI's integration into newsrooms, Marconi probes whether machines will supplant journalists and if they can be entrusted with journalistic duties. He posits that while AI poses both challenges and opportunities, it fundamentally reshapes traditional journalistic methodologies. Marconi introduces "The Newsmaker" concept to underscore AI's inexorable integration into journalism. AI, he elucidates, encompasses smart machines endowed with the ability to learn from experience and execute tasks akin to humans, facilitated by intricate algorithms.

Unlike the linear procedures characterizing conventional journalism, AI empowers dynamic and efficient content creation. Journalists benefit from enhanced multitasking capabilities and streamlined processes, with AI assuming roles such as transcribing interviews and data analysis. Nevertheless, Marconi underscores that AI is not poised to replace journalists but rather enhance their endeavors. While machines adeptly manage mundane tasks, journalists uphold indispensable responsibilities like fostering creativity, undertaking enterprise journalism, and empathetic storytelling.

He contends that navigating the AI-driven newsroom necessitates cultural shifts, fostering collaboration, and mutual comprehension among editorial teams and stakeholders. Despite the promise of AI, Marconi acknowledges its intricacies and latent biases. He cautions against the pervasive influence of market dynamics and political interests on AI algorithms, urging journalists to critically assess AI's impact on news production and consumption. In sum, "Newsmakers" offers profound insights into AI's transformative role in journalism, dispelling apprehensions surrounding its adoption. Marconi's lucid prose elucidates complex AI concepts for journalists and media scholars, providing invaluable perspectives on the future trajectory of news production.

##### 4.1 The Future of Augmented Journalism

In 2017, a Google News Lab event brought together key figures in journalism and technology, including Nick Rockwell from the New York Times and Luca D'Aniello from the

Associated Press (AP), to explore the integration of artificial intelligence (AI) in newsrooms. Central to their discussions was the AP's influential report, "The Future of Augmented Journalism," which delved into AI's impact on news production. Drawing on insights from journalists, technologists, and academics, the report showcased the AP's pioneering AI experiments, such as deploying robotic cameras at the 2016 Summer Olympics and harnessing Google's Cloud Vision API for photo tagging. The dialogue emphasized three main themes:

**Streamlining Content Creation:** D'Aniello highlighted AI's potential to ease journalists' repetitive tasks, allowing them to focus more on core reporting. Rockwell pointed out how AI could uncover newsworthy stories by analyzing vast datasets, thereby enhancing the breadth and depth of news coverage.

**Enhancing Online Dialogue and Reader Engagement:** Rockwell and D'Aniello discussed AI tools like Perspective API, which can facilitate constructive online discussions by automating comment moderation. They also explored the New York Times' aim of using AI to deliver personalized content to readers, tailoring news experiences to individual preferences.

**Maintaining Journalistic Standards:** The panelists stressed the importance of upholding editorial standards in AI-driven journalism. They advocated for practices such as training AI systems alongside journalists, ensuring editorial oversight of AI-generated content, and leveraging machine learning tools to promote inclusive reporting.

#### 4.2 The Challenges of Augmented Journalism

In 2017, the Associated Press published a report called "The Future of Augmented Journalism: A Guide for Newsrooms in the Age of Smart Machines." This report looked at the risks of relying too heavily on AI-generated news. The study was led by a team of experts in journalism, artificial intelligence, and ethics. They wanted to understand what happens when newsrooms use AI-generated insights without fully understanding them. To illustrate this, they presented a scenario where environmental journalists used AI to study the connection between oil drilling and deforestation. The report highlighted the importance of understanding how these algorithms learn, identifying biases in the data they use, and interpreting their findings correctly.



Ultimately, it emphasized the need for newsrooms to have a clear understanding of how AI works to avoid potential pitfalls with AI-generated news.

The team began by inputting a series of satellite images into the AI system, carefully labeling them to distinguish deforestation caused by oil drilling from other reasons. This curated dataset aimed to train the AI to recognize relevant patterns when presented with new satellite images. However, upon analyzing the data, the AI system generated a list of locations where it believed rapid deforestation was linked to nearby drilling activity. When the team visited these locations, they found that the observed deforestation was actually caused by factors like fires or timber company activities, not oil drilling. This discovery highlighted a flaw in the AI's learning process: it had mistakenly associated rapid deforestation with mountainous terrain present in all training images, overlooking the role of oil drilling. If the team had known about this bias beforehand, they could have taken steps to correct it and prevent such errors from occurring.

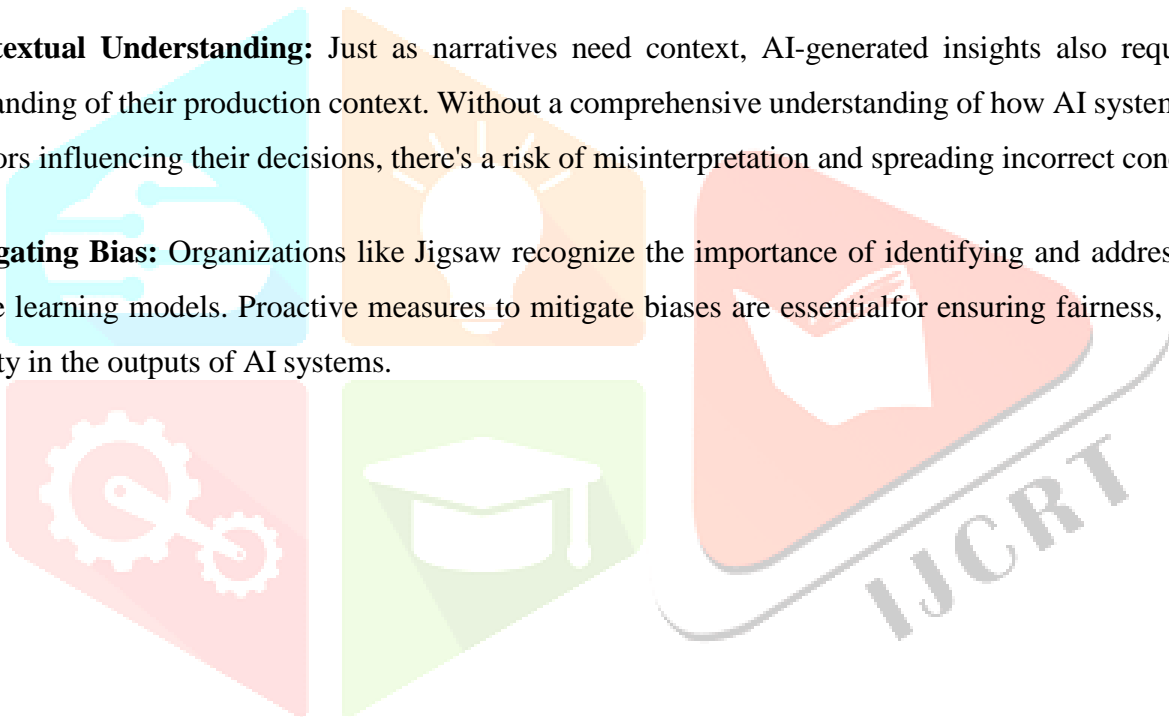
In 2014, the Associated Press (AP) embarked on a significant transformation by integrating algorithms into their operations to automate the production of earnings reports. This strategic decision aimed to boost efficiency and productivity within the newsroom, resulting in an estimated 20 percent reduction in journalists' workload. Lisa Gibbs, AP's global business editor, highlighted the substantial impact of automation, noting a significant increase in corporate earnings stories provided to customers, from approximately 300 to over 3,700. Importantly, this expansion broadened coverage to previously overlooked small companies, enhancing the depth and breadth of AP's reporting. With routine tasks alleviated, AP journalists could focus on more nuanced and investigative endeavors, such as engaging with user-generated content, creating multimedia reports, and exploring complex narratives. However, alongside the benefits came the need for ongoing maintenance and supervision of the automation process. While story templates were meticulously crafted by seasoned AP editors and data feeds tailored by third-party providers, continuous upkeep was vital to adapt to dynamic changes in basic company information from quarter to quarter. Despite the automated nature of story generation and publication directly onto AP's wires, vigilant oversight by journalists remained crucial to promptly address any errors. Thus, automation revolutionized workflows while emphasizing the importance of vigilance and adaptability in navigating the evolving journalistic landscape. The Key Discoveries Outlined in the Published Report Included:

**Bias in Algorithms:** Like humans, algorithms can also exhibit biases. For example, the AI system in the scenario wrongly linked rapid deforestation to mountainous terrain instead of oil drilling, highlighting flaws in its learning process. Understanding how algorithms learn and addressing biases in training data and decision-making processes are crucial to improving their accuracy.

**Verification of Data:** Ensuring the accuracy of underlying data is crucial for AI-generated outputs. Tom Kent's checklist for robot journalism emphasizes the importance of verifying data accuracy, as it directly impacts the quality of AI-generated content. Strict measures are needed to guarantee data reliability and uphold the credibility of AI-generated journalistic content.

**Contextual Understanding:** Just as narratives need context, AI-generated insights also require a nuanced understanding of their production context. Without a comprehensive understanding of how AI systems operate and the factors influencing their decisions, there's a risk of misinterpretation and spreading incorrect conclusions.

**Mitigating Bias:** Organizations like Jigsaw recognize the importance of identifying and addressing biases in machine learning models. Proactive measures to mitigate biases are essential for ensuring fairness, accuracy, and reliability in the outputs of AI systems.



## CHAPTER 3: METHODOLOGY

### 3.1 Aims of the Study

This study aims to look into how Artificial Intelligence and Machine Learning are currently being used in the news industry worldwide. It will also investigate how automated journalism is transforming news production.

### 3.2 Hypothesis

1. Automated Journalism increases the speed and accuracy of news production.
2. Automated Journalism lacks emotional perspectives.
3. Algorithms, like humans, can exhibit biases.

### 3.3 Data Collection Approaches

This study employs a mixed-method approach, utilizing both secondary and primary data sources to comprehensively analyze the research objectives.

### 3.4 Secondary Data Collection

Extensive secondary data is gathered from reputable websites, academic journals, and research papers. This data serves as a foundational element, providing context, theoretical frameworks, and empirical evidence to support the analysis conducted in the study.

### 3.5 Primary Data Collection

The primary data collection method involves the design of a single survey aimed at understanding readers' perceptions of news articles authored by either machines or humans. The survey encompasses respondents aged 14 to 55, spanning educational qualifications from 10th grade to Ph.D. level. It includes interactive questions prompting participants to discern between news articles written by humans and those generated by machine algorithms. Additionally, the survey

assesses the audience's awareness of the utilization of Artificial Intelligence (AI) and Machine Learning (ML) in news production.

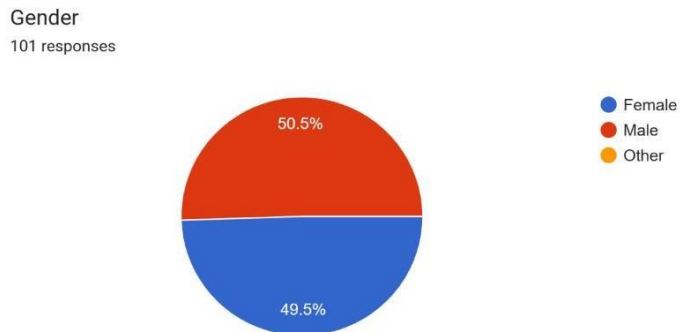
### 3.6 Data Analysis

Data collected from both primary and secondary sources undergo rigorous analysis to identify patterns, correlations, and insights relevant to the research objectives.

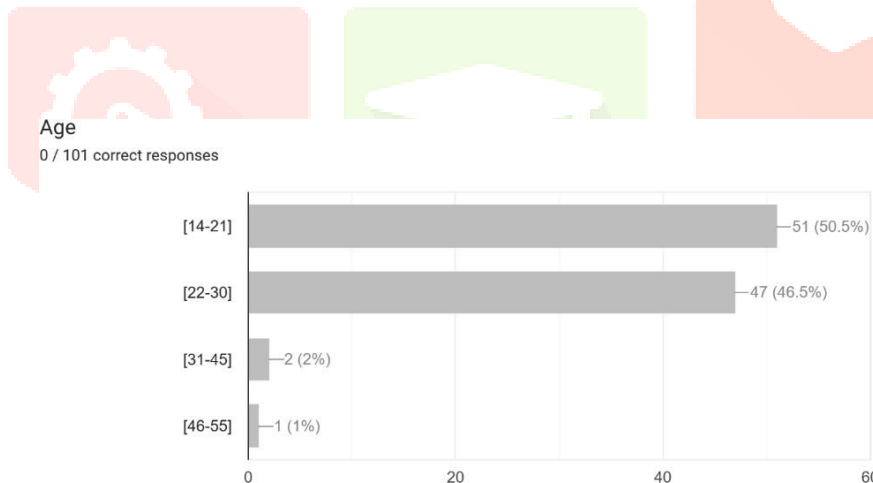


## CHAPTER 4: ANALYSIS OF RESULTS

### 4.1 Results of the Survey



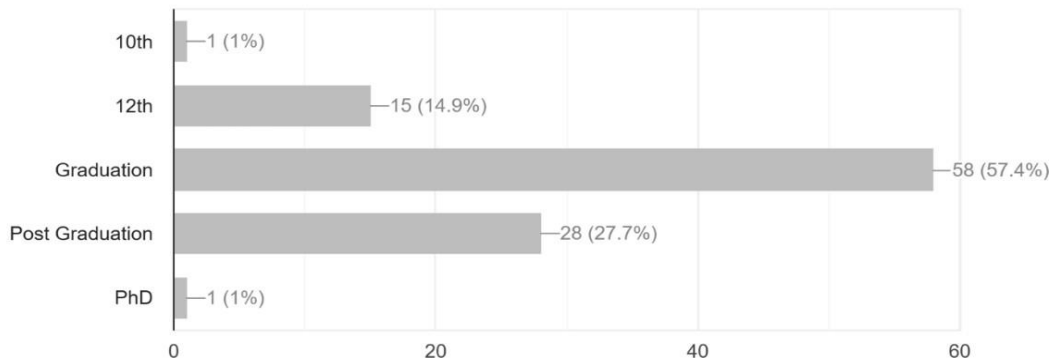
**Gender Distribution:** There were slightly more male respondents (51%) compared to female respondents (49%).



**Age Groups:** The majority of respondents fell into the 14-21 age group (51%), followed by the 22-30 age group (46.5%). There were smaller representations from the older age groups: 31-41 (2%) and 46-55 (1%).

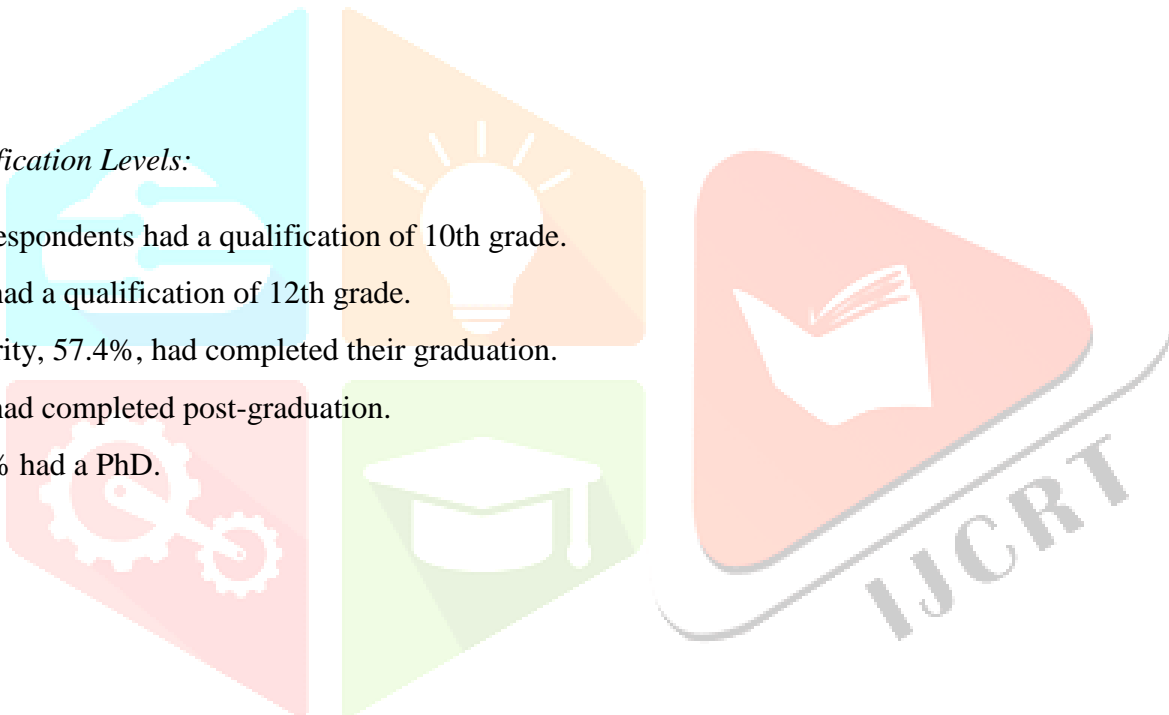
### Highest

0 / 101 correct responses



### Qualification Levels:

- 1% of respondents had a qualification of 10th grade.
- 14.5% had a qualification of 12th grade.
- A majority, 57.4%, had completed their graduation.
- 27.7% had completed post-graduation.
- Only 1% had a PhD.

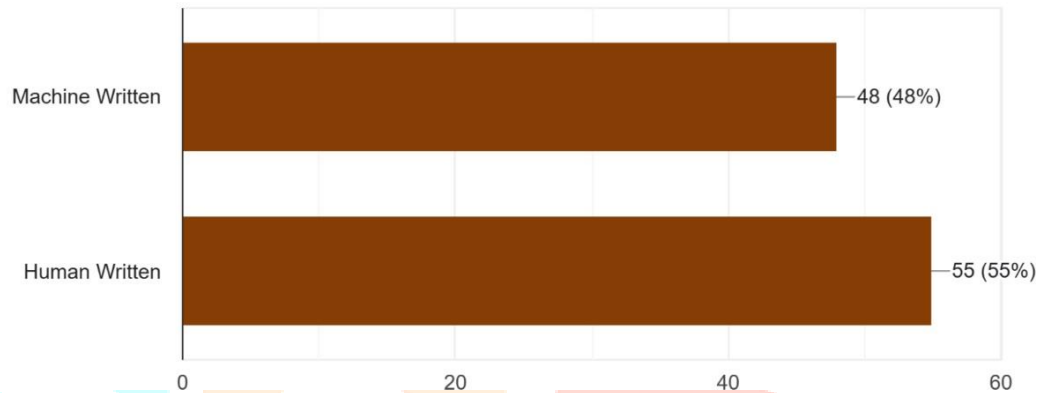




### Survey Question: 1

Read the paragraph and choose the option. 'The Bharatiya Janata Party (BJP) continues to announce candidates for the Lok Sabha elections. ...osing candidates from the 2023 assembly polls'.

100 responses



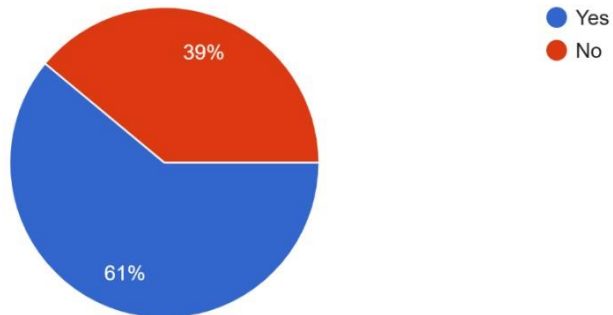
The question was “Read the paragraph and choose the option. 'The Bharatiya Janata Party (BJP) continues to announce candidates for the Lok Sabha elections. Actress Kangana Ranaut was given a surprise nomination for Mandi, Himachal Pradesh, while the party dropped their Hindutva poster boy from Karnataka and revived the candidacies of two losing candidates from the 2023 assembly polls”.

The data from the survey on the authorship of the provided content regarding the Bharatiya Janata Party's actions during the Lok Sabha elections indicates an interesting trend. Despite being generated by ChatGPT, a machine, the majority of respondents (52%) perceived it as being authored by a human. This implies that machine-generated content is either achieving significant proficiency in replicating human writing styles or that individuals exhibit a preference for machine-generated material.

It is possible that the style and structure of the text closely resemble human writing, making it difficult for readers to discern between human and machine authorship. This phenomenon underscores the evolving landscape of artificial intelligence and its impact on content creation and perception in the realm of news and information dissemination.

Do you know Inshort (News App, India) uses Artificial Intelligence and Machine Learning to produce its 60 words News?

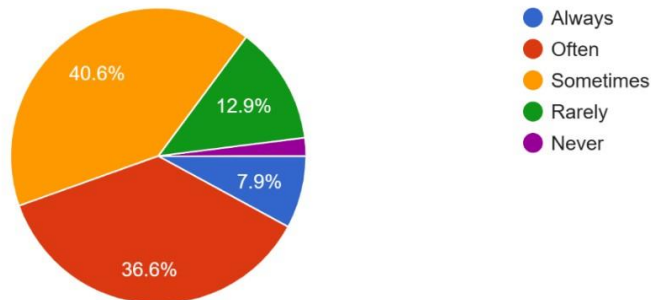
100 responses



The survey results regarding awareness of Inshort, an Indian news app utilizing Artificial Intelligence and Machine Learning to generate 60-word news snippets, reveal a notable trend. Of the respondents, 61% indicated they were aware of this fact, while 39% were not. This suggests a significant portion of the audience remains unaware of the integration of AI in news production. Although 61% awareness is relatively high, the substantial 39% unawareness underscores the importance for news production entities to transparently communicate their methodologies. Providing clarity on news sourcing and editorial processes is crucial to ensuring public awareness and trust in the news they consume.

When reading news articles, how often do you encounter content generated by machines rather than humans?

101 responses



The survey results reveal that individuals have differing levels of exposure to machine-generated content when reading news articles. A majority (40.6%) reported encountering such content occasionally, while a significant portion (36.6%) stated they come across it frequently. A smaller group (12.9%) indicated rare encounters, with only 7.9% reporting constant exposure to machine-generated content. Interestingly, a minority (2%) claimed they never encounter machine-generated content while reading news articles. These results highlight the diverse experiences individuals have with machine-generated content in their news consumption habits.

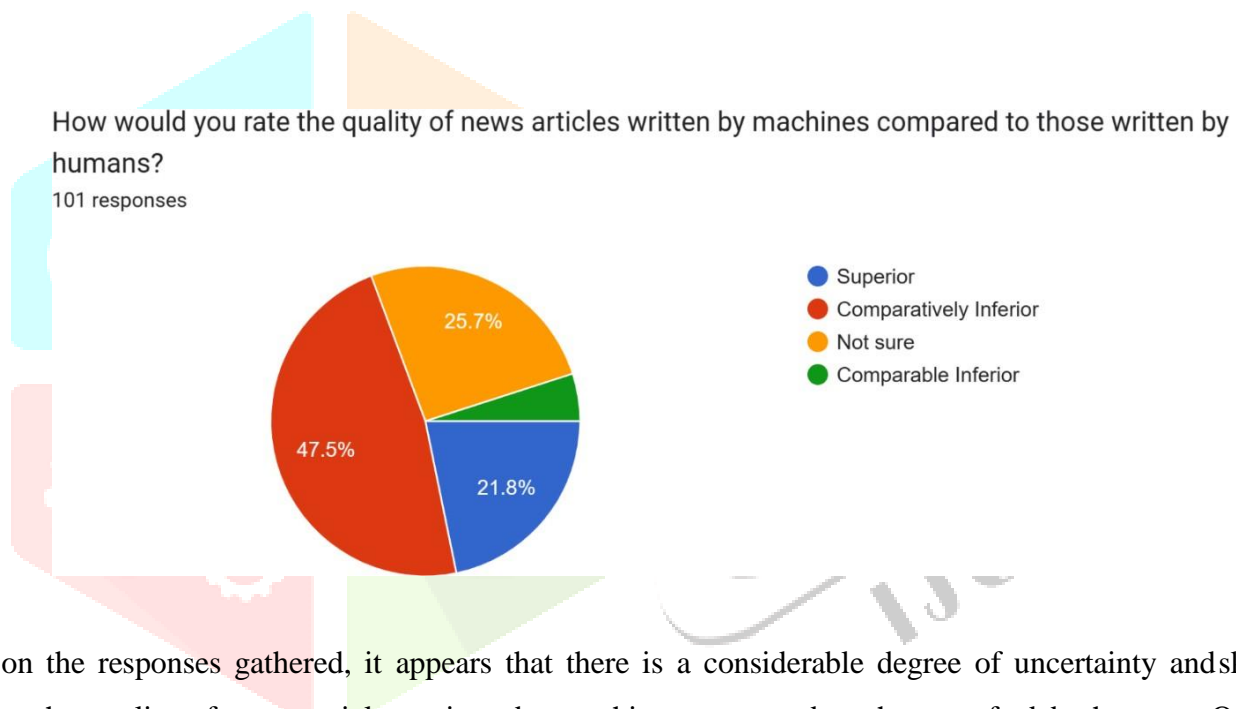
The evolving landscape of news consumption in the digital age presents a fascinating study, as evidenced by the diverse experiences individuals have with machine-generated news content. While its prevalence is increasingly apparent to many, there remains a segment of the population whose encounters with such content are infrequent, possibly due to a lack of awareness.

It is noteworthy that major news agencies such as the Associated Press (AP) and Reuters have long embraced artificial intelligence (AI) in their operations, while in the Indian news industry, platforms like Inshort have prominently integrated AI technologies. Despite this, a notable portion of individuals may not fully comprehend the profound impact of AI on the news they consume. This lack of recognition could stem from inadequate education about AI or its seamless integration

into news platforms, leading to a somewhat obscured understanding among certain segments of the audience.

Moreover, insights from surveys underscore the enduring reliance on newspapers among a significant portion of the Indian audience, notwithstanding the widespread popularity of online news sources. This underscores the necessity of considering both online and offline news consumption habits when analyzing audience behavior and their comprehension of AI integration in news production.

#### Survey Question: 4



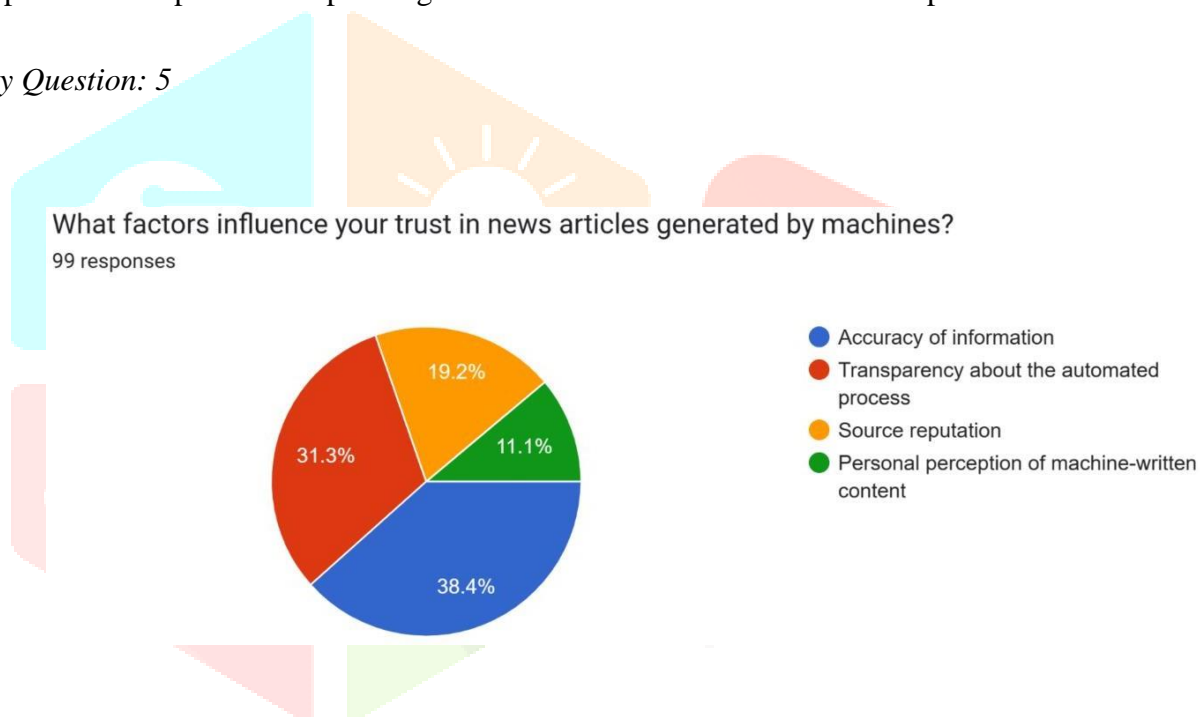
Based on the responses gathered, it appears that there is a considerable degree of uncertainty and skepticism regarding the quality of news articles written by machines compared to those crafted by humans. Out of 101 respondents, approximately 25.4% expressed uncertainty, suggesting a lack of definitive opinion or insufficient information to make a judgment.

Meanwhile, a majority of 53% of respondents deemed machine-written news articles to be comparatively inferior to those authored by humans. This sentiment likely reflects concerns about the potential limitations of AI-generated content in terms of depth, nuance, and editorial judgment.

Conversely, 21.8% of respondents perceived machine-generated news articles as superior to human-written ones. This perspective may stem from observations of AI's ability to rapidly generate vast amounts of content, its potential for reducing biases, or its capacity to analyze and present data in innovative ways.

Overall, these responses indicate a varied perception of the quality of machine-generated news articles, with a notable portion of respondents expressing doubts or reservations about their comparative excellence.

#### Survey Question: 5



The factors that shape our trust in news articles generated by machines can vary widely, as we can see from the responses we've gathered from 99 individuals:

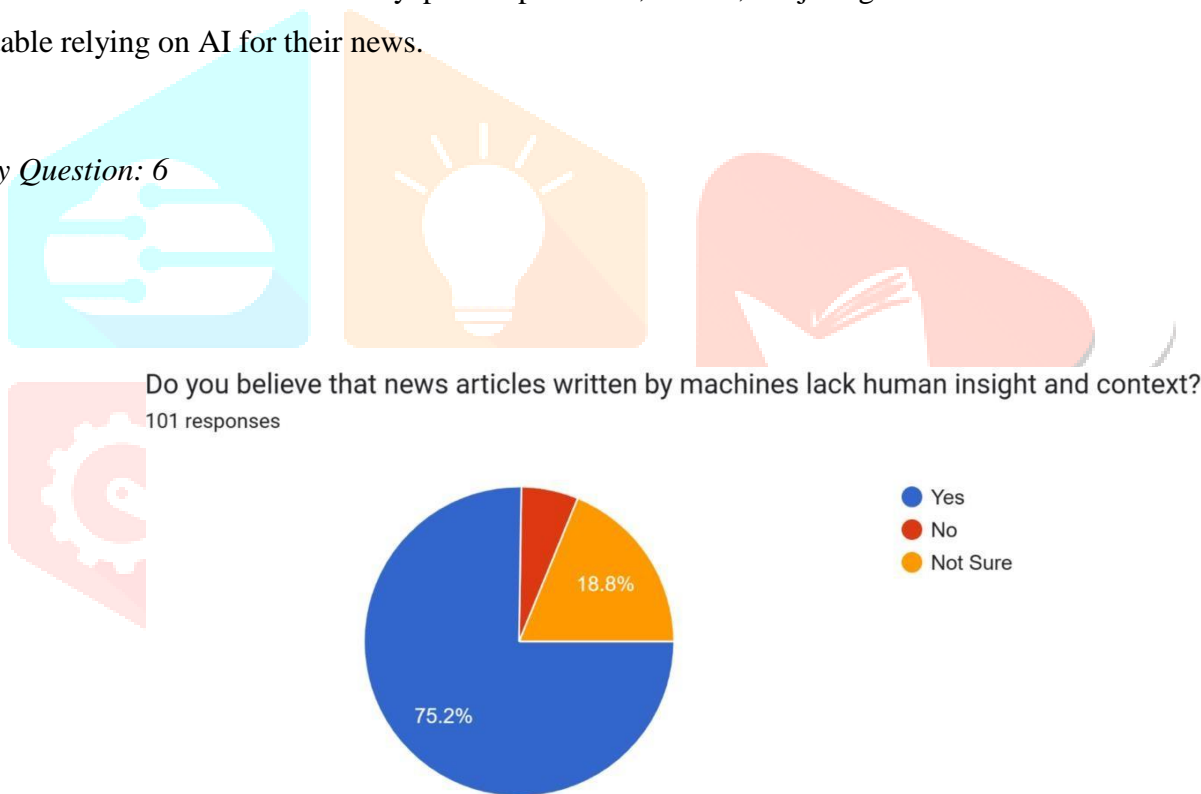
For 38.4% of respondents, accuracy is the linchpin. They emphasized the importance of getting the facts right and ensuring that the information presented is reliable. This makes sense – after all, accuracy is fundamental to trust.

Meanwhile, 31.3% of respondents highlighted the need for transparency about how these articles are created by machines. They want to know the ins and outs of the automated process, understanding its strengths and limitations, and being aware of any biases that might creep in.

Interestingly, for 19.2% of respondents, the reputation of the news source matters most. This suggests that the trustworthiness and credibility of the platform publishing the content play a significant role in shaping perceptions of machine-generated news.

Lastly, 11.1% of respondents mentioned their personal feelings towards machine-written content. This factor is subjective and could be influenced by past experiences, biases, or just gut instincts about whether they feel comfortable relying on AI for their news.

*Survey Question: 6*



The overwhelming majority of respondents, comprising 75.2%, believe that news articles written by machines indeed lack human insight and context. This perspective likely reflects concerns about the inherent limitations of AI algorithms in comprehensively understanding and interpreting complex human experiences, emotions, and societal contexts that often underpin news stories.

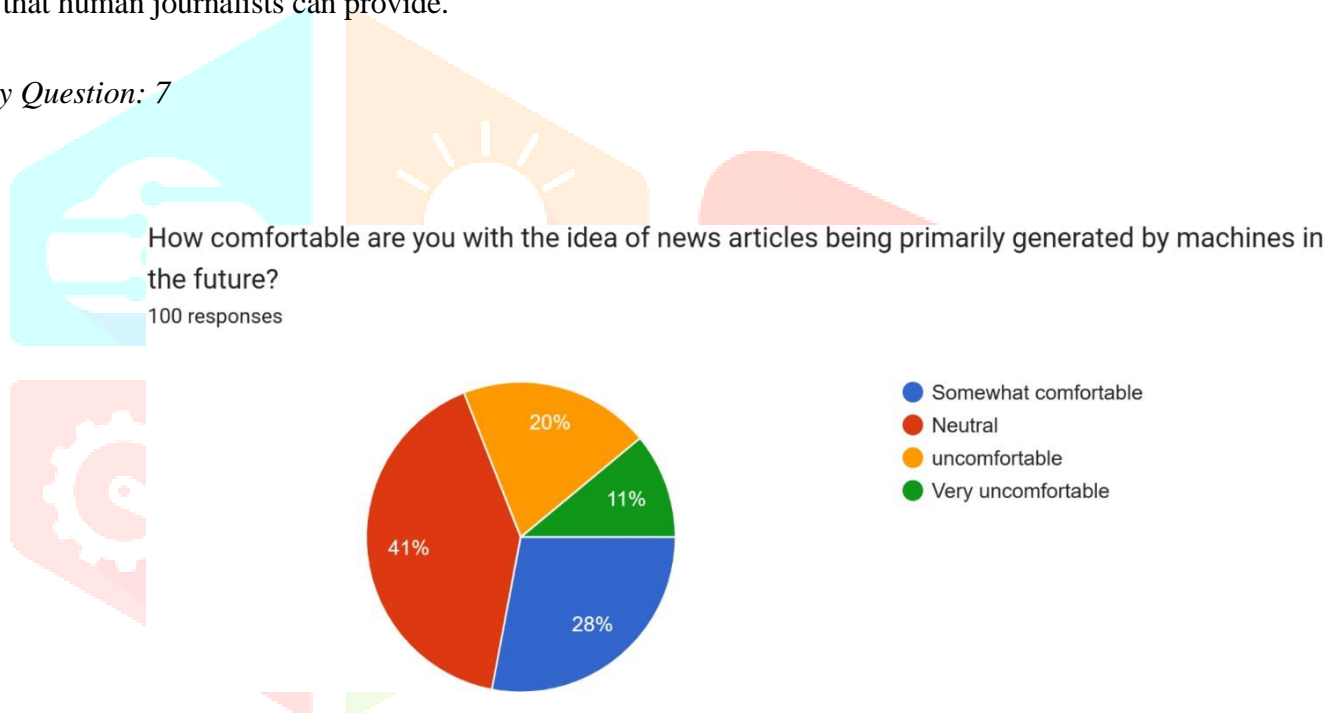


Only a small fraction, 5.9%, disagreed with this notion, suggesting that they perceive machine-generated news articles as capable of providing adequate human insight and context. This minority perspective may stem from observations of AI's ability to analyze data and present information in a coherent manner, albeit without the nuanced understanding that human journalists can bring.

A significant portion, 18.8%, expressed uncertainty on the matter, indicating a lack of definitive opinion or possibly a need for further understanding of the capabilities and limitations of machine-generated news content.

Overall, these responses underscore the prevailing belief among the majority of respondents that while AI may excel in certain aspects of news production, it still falls short in capturing the depth of human insight and context that human journalists can provide.

#### Survey Question: 7



The responses indicate a mixed level of comfort with the idea of news articles being primarily generated by machines in the future, with varied degrees of acceptance and reservation: 28% of respondents expressed a degree of comfort, stating that they are somewhat comfortable with the prospect. This suggests a willingness to embrace technological advancements in news production while maintaining a cautious stance.

A majority, 41%, adopted a neutral stance, indicating neither strong approval nor disapproval of the idea. This ambivalence may stem from uncertainties about the potential implications and consequences of increased reliance on machine-generated news content.

20% of respondents conveyed discomfort with the idea, expressing reservations or concerns about the quality, reliability, and comprehensiveness of news articles produced by machines. This apprehension likely reflects skepticism about the ability of AI to capture the nuances and complexities inherent in human-centric news reporting.

A smaller but notable portion, 11%, indicated feeling very uncomfortable with the notion of news articles primarily generated by machines in the future. This suggests a strong aversion or distrust towards the idea, perhaps driven by fears of biases, inaccuracies, or the erosion of human journalistic values and ethics.

Overall, these responses highlight the need for thoughtful consideration and discussion surrounding the role of AI in news production, taking into account concerns, uncertainties, and varying levels of comfort among individuals regarding the increasing automation of journalism.

#### *Survey Question: 8*

The survey responses provide a nuanced perspective on the prospect of relying on machines to produce news articles (**Appendix II**). While there is acknowledgment of the potential benefits, including speed, efficiency, and impartiality, there are widespread concerns about the loss of human insight and context. Many respondents emphasized the importance of human touch and creativity in news reporting, highlighting the risk of machine-generated articles lacking depth and nuance. Furthermore, there are apprehensions about biases inherent in AI systems, which could perpetuate inaccuracies and misinformation. Additionally, the potential for increased unemployment in the journalism sector due to automation raises ethical and societal concerns. Despite recognizing the advantages of machine-generated content, such as cost-effectiveness and scalability, the majority of respondents expressed reservations about fully embracing this technology in news production. This reflects a complex understanding of the trade-offs involved, suggesting a need for careful consideration and further dialogue on the role of machines in shaping the future of journalism.

## CHAPTER 5: DISCUSSION

### 5.1 Interpretation of Findings

Hypothesis 1 posited that Automated Journalism increases the speed and accuracy of newsproduction. The findings indeed support this assertion, as respondents acknowledged the benefits of automation in terms of efficiency and timely delivery of news articles. However, while speed is enhanced through automation, the perception of accuracy remains somewhat contentious, with a notable portion of respondents expressing skepticism about the quality of machine-generated content compared to human-authored material. Therefore, while automation accelerates the newsproduction process, maintaining or improving accuracy remains a crucial area for further exploration and refinement.

Hypothesis 2 suggested that Automated Journalism lacks emotional perspectives. The survey results align with this hypothesis, as the majority of respondents perceived machine-generated articles as lacking human insight and emotional context. This finding underscores concerns about AI's limitations in understanding and conveying complex human experiences and emotions. As such, while automation may excel in certain aspects of news production, preserving the human touch and emotional resonance in storytelling remains a significant challenge for AI-driven platforms.

Hypothesis 3 proposed that algorithms, like humans, can exhibit biases. The survey findings provide mixed evidence in support of this hypothesis. While respondents acknowledged the potential for biases in machine-generated content, particularly concerning source reputation and transparency, there was also a notable level of uncertainty regarding the presence of biases in automated journalism. This suggests a need for greater transparency and scrutiny of algorithms to mitigate biases and enhance trust in AI-generated news content. Additionally, the findings underscore the importance of ongoing evaluation and refinement of algorithms to ensure fairness and impartiality in news reporting.

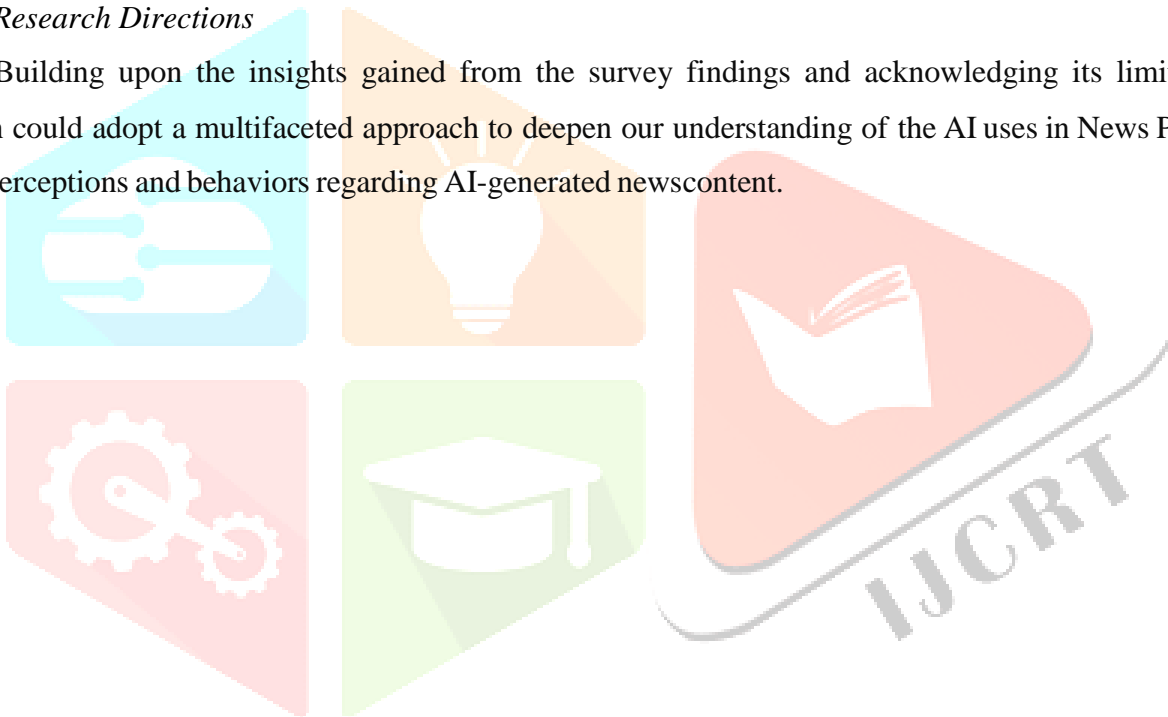
### 5.2 Limitations

While the survey findings provide valuable insights into public perceptions and attitudes towards machine-generated news content, it is important to recognize several limitations. Firstly, the sample population, skewed towards younger age groups and individuals with higher

educational attainment, may not fully represent the broader demographics. This could introduce biases and limit the generalizability of the results. Additionally, the design and methodology of the survey may have influenced respondents' answers, potentially leading to response bias or social desirability bias. Relying on self-reported data raises concerns about the accuracy and reliability of responses, as individuals may be influenced by subjective interpretations or societal expectations. Moreover, the survey primarily focused on perceptions and attitudes, lacking in-depth exploration of underlying motivations or behaviors related to news consumption and trust in AI-generated content. To address these limitations, future research could utilize more diverse and representative samples, employ mixed-method approaches, and incorporate objective measures alongside self-reported data.

### 5.3 Future Research Directions

Building upon the insights gained from the survey findings and acknowledging its limitations, future research could adopt a multifaceted approach to deepen our understanding of the AI uses in News Production and public perceptions and behaviors regarding AI-generated news content.



## CHAPTER 6: CONCLUSION

The integration of artificial intelligence (AI) and automation technologies into journalism represents a significant evolution in the news delivery landscape, offering unparalleled speed and efficiency through automated journalism. Leveraging algorithms to parse vast amounts of data, automated journalism crafts concise news pieces within minutes of events unfolding. However, concerns regarding quality, authenticity, bias, and ethical considerations arise due to the absence of human oversight. Despite these challenges, the history of AI showcases remarkable milestones, culminating in recent breakthroughs like ChatGPT, indicating AI's transformative potential.

Recent trends indicate a notable increase in the deployment of chatbots for news dissemination, notably observed within public service media entities like the BBC and Australian Broadcasting Corporation (ABC). This shift is a response to the evolving landscape of social media, with a noticeable migration towards more private platforms such as WhatsApp and Facebook Messenger. While studies on platforms like the ABC's "newsbot" have revealed positive user feedback regarding its informal tone and content control, concerns linger regarding overreliance on privately-owned platforms like Facebook. Similarly, the BBC's endeavors to engage underserved demographics, particularly the youth, through newsbots are commendable, though the extent of their effectiveness awaits further empirical validation. These developments underscore the dynamic nature of news delivery strategies, with organizations striving to adapt to evolving audience preferences while navigating the complexities of platform dependency.

While automation, including intelligent automation and machine learning, reshapes journalistic practices, challenges such as transparency and the future role of human journalists persist. "Newsmakers" by Francesco Marconi underscores AI's transformative role, emphasizing its symbiotic relationship with human journalists. Conversely, "The Future of Augmented Journalism" by the Associated Press highlights the importance of understanding AI's learning process and mitigating biases to ensure responsible integration. Ultimately, striking a balance between leveraging technological innovations for rapid news delivery and upholding journalistic ethics is essential in navigating this evolving landscape.

The findings from the survey offer valuable insights into the complex dynamics surrounding Automated Journalism and its implications for news production, consumption, and trust. Hypotheses regarding the speed and accuracy of automated news production, the absence of emotional perspectives, and the potential for algorithmic biases were explored, revealing nuanced perspectives among respondents.

While Automated Journalism indeed accelerates the news production process, concerns persist regarding the perceived accuracy of machine-generated content compared to human-authored material. Moreover, the absence of emotional perspectives in AI-generated articles highlights a significant challenge in preserving the human touch and empathy essential for engaging storytelling.

The survey results also shed light on the ambiguity surrounding algorithmic biases in automated journalism. While acknowledging the potential for biases, respondents demonstrated uncertainty regarding their presence, emphasizing the need for greater transparency and scrutiny of algorithms to ensure fairness and impartiality.

However, it is essential to recognize the limitations of the study, including sample biases, methodological constraints, and the focus on perceptions rather than underlying motivations and behaviors. To address these limitations and further advance our understanding, future research should employ diverse samples, mixed-method approaches, and objective measures to explore the multifaceted nature of AI-driven news production and consumption.

Ultimately, as Automated Journalism continues to evolve and reshape the media landscape, it is imperative to navigate the intersection of technological advancement, journalistic integrity, and societal trust to foster a news ecosystem that is both efficient and ethically sound. By addressing these challenges through rigorous research and thoughtful innovation, we can harness the potential of AI to enhance news production while upholding the values of accuracy, empathy, and transparency in storytelling.

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