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Bytes, Bias, and Bylines

Examining AI and the Fourth Estate

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Abstract:

This thesis examines the development and deployment of artificial intelligence technologies in news media organisations. Here a framework is proposed to analyse new AI and digital technologies and their introduction within the news media and journalism sphere. The framework consists of three stages: applications and implications, and actors (AAI). The first stage of *applications* considers the technology itself, including how it is used, defined, and perceived, as well as potential obstacles to its implementation within news organisations. The second stage explores *actors* involved in the introduction of AI technologies at an organisational level, examining the organisational and institutional structures and relationships that may guide and govern their approach to developing and deploying AI technologies. Finally, the *implications* stage examines the considerations that must be taken in developing AI, its effects on individual organisations, across the news media industry, and on wider society, and looks to developing regulation.

This framework is demonstrated via a comprehensive literature review and in analysis using data collected via qualitative expert interviews with seven key actors in AI from five eminent global media news organisations and one non-profit coalition. Interview participants included the Head of Technology Forecasting at the BBC; the Local News AI Program Manager at the Associated Press; an AI and ML engineer from SVT; both the CTO and another senior technology manager at RTÈ; the Head of Cloud, Analytics, and Insight at Al Jazeera; and the AI and Media Integrity Program Lead at Partnership for AI.

The findings of this work prove that AI is not a hypothetical future possibility for news organisations, but rather a technology currently being developed and deployed in newsrooms and organisations globally. The empirical data is intended to demonstrate the functions of a framework motivating new pathways for research that can, piece-by-piece, further our understanding of emerging artificial intelligence technologies and establish methods of academic study and insight. Ultimately this thesis contributes to the growing body of literature on the intersection of artificial intelligence and news media by illustrating the field's current landscape, demonstrating the effectiveness and applicability of the AAI framework, and indicating the steps organisations can take in the facilitation of the responsible and efficient adoption and integration of AI.

Keywords: artificial intelligence (AI); global news media; organisational change; news organisations; newsroom; technology; digital innovation

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My path to AI was punctuated by a childhood hatred for all-things numbers related, a bachelor's degree in English Literature, and a general sense of disbelief from anyone who's ever known me upon finding out my research topic of choice. Orla! AI! Who would have thought it?! Certainly not my long-suffering high school maths teacher. But at AI I arrived anyway.

This thesis is dedicated to my family: my mum Gráinne, my dad Martin, and my sister Caoimhe. Thank you for installing in me curiosity, a sense of wonder and adventure, and boundless self-belief. I will never be able to repay you enough (quite literally.) Despite thousands of miles and hours of time difference, you have been with me every step of the way. The sun never sets on the McElroys! Also to Aoife and Fluffer, my home away from home away from home, thank you for always having me, even if Fluffer is a bit bitey. I love each and every one of you so incredibly much.

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And just in case it becomes sentient enough to read this anytime soon: thank you AI!

(I will be securing a seat on the robot ark.)

Contents Page

Acknowledgements.....	2
Introduction.....	5
Mapping the Landscape.....	5
The News Media Industry of Late.....	6
Encouraging Multidisciplinary Study.....	7
The Importance of Examining AI.....	8
This Research.....	9
Research questions.....	9
Literature Review.....	10
Knowledge Gap.....	10
Establishing Frameworks.....	12
Previous Frameworks.....	12
AAI: Applications, Actors, Implications.....	14
Applications.....	15
Perceptions.....	15
Strategy: Introducing AI.....	17
Engaging with Business Perspectives.....	17
Creating Strategy.....	18
Obstacles to Application.....	19
Actors.....	20
Collaboration.....	20
Organisational Structure.....	21
Technical Development.....	22
Implications.....	23
Considerations.....	23
Labour and Automation.....	23
Ethics.....	25
Power and Control.....	26
Effects.....	27
Journalistic norms and practices.....	27
Regulation.....	29
Transparency and Accountability.....	29
Methodology.....	31
Methodological Approach.....	31
Semi-structured Interviews.....	32
Research Design.....	33
Interviewing the Elite.....	33
Sampling and Interviews.....	34

Analysis Methods.....	36
Coding and Analysis.....	37
Analysis.....	40
Applications.....	40
Perceptions.....	40
Strategy: Introducing AI.....	43
Obstacles to Application.....	43
Actors.....	45
Collaboration.....	46
Organisational Structure.....	46
Technical Development.....	48
Implications.....	50
Considerations.....	50
Effects.....	53
Regulation.....	56
Conclusion.....	59
What is the current landscape of AI in news media organisations in terms of its applications, actors, and implications?.....	59
To what extent is the AAI framework applicable and efficient in the analysis of AI technology in news media organisations, and what are its strengths and weaknesses?.....	61
What steps can organisations take to facilitate the responsible and efficient adoption and integration of AI?.....	62
Looking Forward.....	63
Bibliography.....	64
Appendix.....	68
Use Case Coding.....	68
Interview Guide.....	69
Interview Tracker.....	70
Opportunities During Research.....	71
Nvivo Coding.....	71

Introduction

The robots are coming!

This thesis is not a work of science-fiction. The entrance of artificial intelligence (AI) into the news media industry is not a hypothetical theory, an abstract imaginary, nor a future prediction. In fact, the use of artificial intelligence is an ongoing phenomenon in newsrooms and media organisations at nearly every level across the globe, undergoing design, development, and deployment as we speak. As an algorithmic technology AI is not without its cons, ranging from the encoded bias of its creators (Angwin et. al, 2016; Noble, 2018; Broussard, 2019) to issues of data transparency, privacy, and security (McBride and Rosenstiel 2014; Hansen et. al, 2017). However, underpinning these considerations is a vein of potential. In an industry grappling with issues related to technological disruption, changing audience expectations, and dwindling profits, AI has emerged as a likely transformative force, presenting both journalists and the organisations that they represent with a wealth of opportunities and threatening a complete reshaping of what we have come to know as the fourth estate.

AI is by no means the first technology that has sought to reshape the ways in which news is produced, distributed, and consumed. From the printing press to steam trains, the telegraph to mobile phones, and the world-wide-web to social media, news has been rocked by a series of disruptive technologies throughout its history, each transforming the face of the industry almost entirely. Unlike these technologies however, AI represents a unique challenge resulting from its ability to automate tasks that were once exclusively the domain of human journalists. The deployment of AI is not without challenges, and questions regarding its impact upon journalistic ethics and norms, newsroom culture, and audience trust remain unresolved. This thesis explores the complex and multifaceted relationship between AI and the fourth estate, examining the technologies involved, the actors and organisations driving their deployment, and the implications for the future of journalism as we know it.

Mapping the Landscape

While artificial intelligence has existed as a concept since the early 1960s (Anyoha, 2017) we have seen the most rapid advancement of the technology throughout the 2010s, with a particular acceleration in only the past two or three years. This acceleration has seen

the entrance of AI into nearly all walks of life and professional industries, including that of news media and journalism. The introduction of AI into journalism has seen “algorithms editing, aggregating, publishing, and distributing content, with processes of media production and consumption increasingly being automated” (Dörr, 2015:700). Journalism has long been shaped by technologies and the past several decades have only further demonstrated the integration of computerised and algorithmic technologies into news and news work (Pavlik, 2000).

Despite its emergence from the realms of STEM, AI can now be seen across nearly all academic disciplines and professional industries. In its very definition AI is “polysemous and problematic,” (Lewis, 2019a:673) composed of “hieroglyphs... shaped by the tool by which they are carved, requiring of priestly interpretation” and telling “powerful but often mythological stories—usually in the service of the gods” (Gillespie, 2014: 190). Beyond recognizing AI as a fluid concept subject to rapid change, for now we will settle upon an intentionally broad definition of artificial intelligence as the theorization, design, development, and deployment of computer systems capable of performing feats usually requiring human intelligence. The definition perhaps most crucial in developing an understanding of AI for the purposes of this paper is that of *communicative AI*, which we can understand as artificial intelligence technologies designed to act as communicators themselves in a disruption of traditional conceptions of human communication (Guzman & Lewis, 2019; Lewis, 2019). AI can be understood as an umbrella term containing seven subfields, those of machine learning (ML); computer vision (CV); speech recognition; natural language processing (NLP); planning, scheduling and optimisation; expert systems; and robotics (de-Lima-Santos and Ceron, 2022:15). These subfields are themselves fluid and interwoven, with AI technologies and software often drawing from multiple fields at a time.

The News Media Industry of Late

A key in exploring AI’s specific intervention into the media industry is perhaps best developed in examining the problems faced by news organisations as of late. Despite the general acknowledgement that ethical responsibilities such as the telling of truth, fairness and impartiality, and humanity remain core to the purpose of news, an arguable distancing from these values appears to have taken place in current-day processes of production, distribution, and consumption (Ethical Journalism Network, 2020). Demands of the modern day, ranging from the expedited 24-hour news cycle and an emphasis on speed and brevity, to demands on

labour and ‘brain-drain’ within the newsroom and the over-saturated conditions of the media landscape imposed by social media, produce an environment in which ethical and moral motivation are at risk of being sacrificed in favour of more honed business edge and operational efficiency. The pressures upon contemporary newsrooms have seen the emergence of three values identified by Nikki Usher (2014) as reshaping newswork: immediacy, interactivity, and participation. In the service of these emerging values, news organisations have been required to strengthen their digital strategy, if they even had one to begin with. This evolution has posed issues within an industry which, some argue, has a “lack of tradition in experimenting and investing in technology and digital talent” (Paulussen, 2016:194) an oversight that now risks a loss in both attention and revenue for traditional media organisations. The digital strategy that does exist is often viewed as largely unoriginal due to a fear of experimentation and a general attitude of ‘if it's not broken, why fix it.’ (Boczkowski, 2010; Lowrey, 2012) As such, AI has the potential to act as the vital shock-to-the-heart that the news media industry requires, engaging in a holistic reshaping of the fourth estate by allowing journalists to work more efficiently, delivering more relative content to audiences, and improving business efficiency at large.

Encouraging Multidisciplinary Study

The intersection of AI with media and communication studies has seen increasing academic attention over the last several years. An indisputable fact is that this area of study is innately intersectional, requiring an understanding that transcends disciplines in order to make sense of not only the technology of AI itself, but its interactions, implications, and effects across our socio-political and economic existence. As Lewis (2019a:673) attests, the study of AI for news media “must be foregrounded in the larger context of the digitization of media and public life.” Knowledge of the intricacies of AI’s interaction with news media organisations cannot be found solely within the confines of journalism, communication, or even the social sciences; but requires dabbling in the realms of computer science and business, particularly in order to gauge the practical aspects and obstacles in the adoption of AI. The study of AI, particularly through the lens of a sociological field such as media studies, “must not conceive of algorithms as abstract, technical achievements, but must unpack the warm human and institutional choices that lie behind these cold mechanisms” (Gillespie, 2014:169).

If we were to assign this thesis allegiance to a singular field of research it would be that of digital journalism studies. As an area of media and communications, digital journalism studies considers “core questions related to the economy, technology, sociology, culture, language, psychology, and philosophy of what journalism is” (Steensen and Westlund, 2021:1) at a time when older demarcations of the field, such as those between different institutions and companies, production and consumption, technologies and human, private and public, and the truth and lies, have begun to degrade. Steensen and Westlund, scholars in the field, write that “digital journalism is much more than the study of journalism produced, distributed, and/or consumed with the aid of digital technologies” (Ibid.) but rather a cross-disciplinary field examining the disruption of all we have traditionally associated with media, journalism, and public spheres. Given its recent emergence as a field, digital journalism studies remains rather underdeveloped, with a continued trajectory of growth requiring greater connections to be made not only to fields such as the humanities, politics, and economics, but to technological fields of computer and information science—connections that this thesis attempts to make.

The Importance of Examining AI

Beyond the obvious precedence of the future potential of AI for news media, the point of even examining this intersection lies in the fact that both AI and journalism are “deeply human endeavours” (Broussard, 2019:678). In a sentiment that can also be applied to the news that we consume, AI technologies embed and encode human values and beliefs, making them “profoundly political” (Diakopoulos, 2019:679) in nature, and moreover, incredibly powerful in their potential effect upon our interactions and existence. As such, the collision of the two and the potential power they hold in combination over our everyday social, political, and economic interactions, demands particular attention. AI, if used responsibly and efficiently, could function to improve processes of journalism and make them easier and more refined. It could enable creativity, alleviate from overburdened resources, assist in processes of production and publication, and enhance audience participation and accessibility. However, this could come at a cost, hence the importance of examining, analysing, and critically engaging with every aspect of this emerging technology. My own motivation in embarking in media studies has always been in negotiating the balance between the perceived ethical and moral duties of news organisations, such as truth-telling and a sense of humanity, with the maintenance of a functioning business model. AI is not necessarily the cure to this

age-old balancing act, but it does warrant investigation as a potential solution, or at least examination in ensuring that the latter does not come at the expense of the former.

This Research

With a view to assisting the ongoing research into AI development and deployment in news media, this study is a theoretical piece establishing a new heuristic for approaching the adoption of emerging digital technologies such as artificial intelligence into news media organisations. In this thesis I propose a framework to be used in the analysis and assessment of new digital technologies, consisting of three stages: applications, actors, and implications (AAI). In order to demonstrate the AAI framework I shall apply it against qualitative insights drawn from expert interviews with key actors in AI from five eminent global media news organisations and one non-profit coalition. With participants from the United Kingdom, North America, Ireland, Sweden, and the Middle East this research establishes a comprehensive global view on the current state of AI development and deployment within news media organisations. Interview participants included the Head of Technology Forecasting at the BBC, the British public service broadcaster broadcasting in over 40 languages globally; the Local News AI Program Manager at the Associated Press in the United States; an AI and ML engineer from Sweden's public service broadcaster SVT; both the CTO and another senior technology manager at RTÉ, Ireland's public service broadcaster; the Head of Cloud, Analytics, and Insight at Al Jazeera, a global news network based in the Middle East; and the AI and Media Integrity Program Lead at Partnership for AI, a non-profit coalition working to establish responsible AI use across the media industry and beyond. These empirical elements do not seek to explicitly evaluate the efficiency or practicalities of AI use in news media organisations, nor assign a net-positive nor negative value to findings; such analysis is outside the scope of this project. Rather, the empirical data is intended to demonstrate the functions of a framework motivating new pathways for research that can, piece-by-piece, further our understanding of emerging artificial intelligence technologies and establish methods of academic study and insight.

Research questions

1. What is the current landscape of AI in news media organisations in terms of its applications, actors, and implications?
2. To what extent is the AAI framework applicable and efficient in the analysis of AI technology in news media organisations, and what are its strengths and weaknesses?

3. What steps can organisations take to facilitate the responsible and efficient adoption and integration of AI?

Literature Review

Knowledge Gap

Previous literature relevant to this project often splits into three divisions; literature that pertains to the study of artificial intelligence, often highly technical in nature and rooted in the study of computer science and engineering; literature from the field of media studies which while exploring news production processes or digital technologies, makes little mention to AI specifically; and finally literature that explores the precise intersections of AI with news media, but is often new and investigative in nature due to the relative novelty of the field and technologies.

The first division of technical literature explores AI models and algorithms leveraged for use within news media. One area of AI integration into news media that has seen a wealth of such technical academic focus is that of identification and source verification technologies, for use in the battle against ‘fake news.’ Earlier works, such as Mihalcea and Strapparava’s (2009) program for the automatic recognition of ‘deceptive language’ were followed by a number of studies furthering the development of similar models (Mikolov et. al, 2013; Rubin, 2015). Post-2016, following the Brexit referendum in the United Kingdom and the presidential election in the United States—events which saw allegations of fake news on all sides of the political spectrum—the field saw an explosion of attention and thus renewed interest and investment in generating AI technologies with the potential to reduce the phenomenon’s spread and effect (Long et al., 2017; Ibrishimove et. al., 2020; Karwa and Gupta, 2021). Beyond fake news detection, the past several years have seen work developing AI models for purposes such as collecting and analysing coverage of COVID-19 (Vuong et. al, 2019). While such papers offer insight into the technical makeup of AI models and algorithms, demonstrating the wealth of work in the field, they do little in the way of considering the external contexts and implications of such technologies, and deviate little from their scientific roots in methods of analysis and consideration.

The second division of literature heralds from the field of media studies. Many works delve into the introduction of new technologies into media production cycles (Deuze and Paulussen, 2002; Örnebring, 2010; Jose Hernandez Serrano, 2015), enabling insight on the academic importance of considering new technologies not only from a scientific perspective, but also encouraging holistic approaches from the perspectives of the social sciences and humanities. Such literature allows for a wealth of contextualization, alongside motivation for the direction of this study, however makes little mention to the specificities of AI's entry into journalism and news media, and its potential implications for the industry and broader society.

In the third division we finally arrive at the precise topic of AI's entrance into news media. Identified as falling into the field of digital, algorithmic or computational journalism, literature on the area has been recognized as "relatively scant" (Anderson, 2012:1006). Despite artificial intelligence's conceptual existence for several decades, its rapid expansion and resulting collision with journalism and news media is a phenomenon of the last few years. As such, literature on the topic remains at a "nascent stage" (de-Lima-Santos and Ceron, 2022:14) and thus predominantly introductory and speculative in nature. A desire for AI technologies can be identified across the industry with existing academic insights clearly identifying AI's potential as a disruptive force for news' current methods of production and distribution (Beckett, 2019). Often previous research on the functions of AI within news media, such as LSE's JournalismAI project (Ibid.) and research on Al Jazeera's use of AI for source confirmation (El Gody, 2021), can summon questions on the project's degree of conflict of interest. This is a result of the fact that projects such as LSE's lab find funding in Google News' program, and El Gody's work is contained within Al Jazeera's own research institute, two organisations with an arguably invested interest in the success of AI for journalistic purposes.

As such, while previous research does *begin* examining AI's intersection with news media, there remains a need to *continue* insight and establish impartial methodology and frameworks for analysis. Some begin in the direction of designing methodology (Anderson 2012; Dörr, 2015), but their work functions largely to formulate critical questions for future research and in providing inspiration and potential lenses, rather than firmly establishing framework. Resultantly there exists a vacuum in which to execute research that not only considers the details and implications of AI's existence within journalism and news media,

but establishes framework to assist in future work and the inevitable development of technologies for use in news media.

Establishing Frameworks

In his 2010 work, Örnebring identifies a reluctance of media scholars to “rethink theories or build new ones on the basis of their findings” (202) especially in their exploration of the field of digital journalism. As such, this work attempts to establish a new framework for examining the entrance of new digital technologies, such as AI, into news media organisations. Understanding these technologies and their effect on public discourse requires thinking not only about their technical properties or business strategy behind their deployment but also establishing sociological inquiry, and considering the ways in which they are made to matter (Gillespie, 2014; Bucher, 2018). While AI and algorithmic technologies “need to be understood in context, [their] meaning cannot be reduced to context either” (Bucher:126) and as such we must ensure that approaches of analysis are holistic and go beyond emphasis on singular elements of their construction, deployment, or implications, instead considering all of the above.

Previous Frameworks

While previous research in the specific area of AI may be scant, the production of new frameworks requires looking to past examples of study, even if they do not pertain specifically to the analysis of AI. A keystone work in any study of news media is Schudson’s 1989 *Sociology of News Production*. In this paper Schudson establishes three perspectives for examining processes of news production with a sociological view. The first takes a view of political economy that “relates the outcome of the news process to the economic structure of the news organisation” (Schudson, 1989:266) and understands journalism as a profit-seeking industry that produces conservative, system-maintaining news. Schudson’s second perspective is of mainstream sociology, through which we examine social organisation and journalism as an occupation, thus considering the “autonomy and decision-making power” (Ibid:266) of the individual journalist or actor within the news process. The third and final perspective is that of a culturological approach. Here Schudson emphasises the effect of wider cultural-symbol systems that constrain news processes beyond the details of the

organisational and occupational routines associated with journalism. Other researchers borrow from Schudson, arguing that “journalism is constituted through a social, organisational, and professional sphere” (Dörr, 2015:409) and adopting his approach in their analysis of news production and its relevant technologies. Anderson, in his 2012 work on establishing a sociology of computational and algorithmic journalism, adapts Schudson’s perspectives into a narrower six lenses to be applied in the study of the intersection of computational technologies with journalism and news media. Anderson’s lenses—political, economic, field, organisational, cultural, and technological—attempt to holistically examine computational journalism. While a political perspective looks at public policies that promote or discourage the use of computational practices, the economic lens examines how institutional resources create asymmetries in journalism’s ability to serve the public. Field approaches consider how field homologies affect the distribution of power, while the organisational perspective focuses on how tech is modified or resisted within institutions. Lastly, a cultural lens examines the interactions within larger symbolic systems, while a technological approach examines the values in journalistic design and the evolving role of evidence in journalism (Anderson, 2012: 1011).

Researchers further emphasise that approaches should consider layers of technical, organisational, and social contexts when analysing new technologies, rather than confining to a singularly user-centric approach (Kallinikos, 2004; Linden, 2016). As Steensen and Westlund (2021) emphasise, digital journalism studies should not be solely about the journalism sector, but sensitive to society beyond the sector, building research relevant to not only the industry but also to broader academic scholarship. In constructing new frameworks it is crucial to look to previously established methodologies. However, we must recognize that journalism remains an evolving field, and moreover that AI is an area entirely unrecognisable compared to its existence only a year or two ago. Steensen and Westlund (2021:107) identify that often in research where “scholars have stood on the shoulders of previous studies in developing their research designs, seeking to replicate, follow up, or add new geographical dimension” they awaken from their project deadline to discover that journalism itself has chosen, or been forced, to move on and their research rendered largely defunct. As such the argument remains for curating new and timely methods which, while learning from past examples, seek to establish critical perspectives and insights that can be carried forward in pace with the rapidly changing landscape of news media and AI technologies.

AAI: Applications, Actors, Implications.

As Bucher (2018) emphasises, AI and algorithms “do not exist in a vacuum... (they are) always built and embedded into the lived world, at the level of institutional practice, individual behaviour, and human experience.” Despite this, when constructing methods of analysis we must analyse both technology and the news on their own terms, without reducing either to solely their political, economic, cultural or social construction (Anderson, 2012). In his 2014 work, Gillespie emphasises that we should turn as much to the “sociology of knowledge as to the sociology of technology,” (169) with an aim to identify how tools such as AI are “called into being by, enlisted as part of, and negotiated around collective efforts to know and be known.” Ultimately sociological inquiry should aim to uncover the intricate mechanisms contained within AI, meaning not only the internal process through which it selects information for users, but the social processes that legitimise it for our use (Ibid).

Much like Schudson’s (1985) perspectives, via the three stages of Applications, Actors, and Implications, the AAI framework is intended to allow users to consider the political, economic, social, and cultural aspects of AI’s introduction into news media organisations and processes. Further similarities arise to Anderson’s (2012) lenses, which go beyond Schudson’s model in also adopting consideration of institutional and technological effects, two areas increasingly leveraged in contemporary research. Where my framework differentiates from their respective works however is in its specific tailoring to the new and emerging technologies of artificial intelligence. Aspects adjacent to Anderson’s lenses can be found in each stage of the AAI framework, however the rearrangement invites users to closer engage with the actualities of AI development and deployment at an organisational level, rather than a grounding solely in the theoretical academic concepts linked to this discussion.

The AAI framework is divided into three stages, those of applications, actors, and implications. The themes noted through the course of the AAI framework are also themes present through literature of relevance to this area of study. As such this literature review functions not only to expand on each stage and subcategory of the framework and their presence within the literature itself, but also to prove the function and importance of each stage. Ultimately AI, much like journalism, “performs multiple overlapping functions” (Anderson et. al., 2012:35). As such, literature that attests to the first stage of the model, *applications*, considers the technology itself; how it is used, defined and perceived, in addition to considering the strategy of how the technology might be implemented within a

news organisation, and potential obstacles to this process. In the second stage, we move to literature considering the *actors* involved in the introduction of AI technologies into news media. As Steensen and Westlund (2021:23) emphasise, “what journalists and news organisations do is inexorably linked to their culture and institutionalised routines,” and so in holistically considering the introduction of AI technologies, we must examine the organisations themselves; how their organisational structures and both internal and external relationships with fellow organisation and tech providers may guide and govern their view on and approach to developing and deploying AI technologies. In examining these technologies, we must consider the multidimensional entanglement of their use with their broader effect upon users and indeed society (Gillespie, 2014.) As such, in the stage of *implications*, we arrive at literature examining the effect of these technologies on individual organisations, across the news media industry, and on wider society, in addition to the considerations that have to be taken into account in the use of AI, and look at how regulation can be created and enacted. Given that AI tools are already in use throughout news organisations globally, what this framework aims to address is not whether AI has a future potential to play an important role in journalism and news work, but rather “in what way this role is playing out in practice, how it is accounted for and made relevant, and when it comes to matter to specific actors in a given setting” (Bucher, 2018:124).

Applications

In order to begin the holistic examination of AI’s entrance into the news media industry, the applications stage of the framework focuses on an examination of AI itself, and how it is perceived, defined and used. This stage additionally involves an exploration of the strategy required in introducing AI, and the need to engage with business perspectives throughout the course of this thesis in order to understand the deployment of AI from an organisational level. Finally, we identify challenges that may hinder or impede the successful deployment of AI in news organisations.

Perceptions

A frequent feature of perceptions and understandings of AI, both in the realms of academia and in everyday life, is comparison against previous technologies. The reason for these comparisons stems from attempts to draw familiarity with an otherwise new phenomena and, specifically within media studies, in allowing us to contextualise the previous effect of

disruptive technologies on the news industry. While similarities are often drawn between AI and other recent digital technologies, such as social media and the world-wide-web, technologies have long had a disruptive effect across news and journalism. Innovations like steam ships or telegraph lines have played a crucial role in the race between newspapers to have the earliest publication of exclusive news. Örnebring (2010:65) summons a particular example of a remote local newspaper in Sweden adapting their publication schedule around train times, hiring “railway employees as news gatherers and investing in a subscription to news agency material via telegraph,” demonstrating the long standing effect of technologies in shaping news organisation habits and processes.

Those fearful of the concept of AI’s entrance into journalism and news media may summon an image of an entirely autonomous robot-being dominating the trade and industry. However, Hansen et. al. (2017:2) suggest that AI will enhance rather than replace journalists' work, and in fact, “for AI to be used properly, it is essential that humans stay in the loop.” While some theorists adhere to Zuboff’s 1988 law that “everything that can be automated will be automated,” others suggest that the history of automation suggests that despite the existence of automation for many years, we are yet to see everything be automated and this will remain as such (Linden, 2016). The perception of AI as a hands-off technology is one perpetuated by the providers of these technologies in order to maintain a performed legitimacy. This increasing invisibility implies AI as “neither entirely material, nor entirely human” instead positioning the technology as a “hybrid, composed of both human intentionality and material obduracy” (Anderson, 2012:1016). While the assertion of AI as a disruptive technology is an increasingly indisputable title, we must be careful in prematurely assuming it as an entirely revolutionary one. Hyperbole about technology is an aspect of what Broussard (2019:676) identifies as *technochauvinism*, or “the assumption that technical solutions are always superior to other solutions.” In a balanced exploration of AI, we should avoid catastrophization of the technology, and restrain from viewing AI as a magic bullet for journalism, but instead as merely a shiny new tool (Ibid:677). Despite excitement around AI we must remain cautious and critical and avoid “falling into traps of thinking that this is the next technology that will save,” or indeed destroy, journalism (Steensen and Westlund, 2021:37).

Strategy: Introducing AI

Engaging with Business Perspectives

While there is a temptation in academic study to adhere to an examination of theoretical concepts and the hypothetical broad implications of AI's entry into the news media industry, it is important to consider news media as just that; an industry. If thought is not given to other pressing aspects of the news organisations, such as the maintenance of profit margins, resource management, and the other nuances of efficient business models, then academic speculation remains purely hypothetical, and of little relevance to the actualities of news media. As Paulussen (2016:197) remarks "there is an ongoing tension between a business view... and a journalistic view" resulting in a lack of resources that acts as "a major constraint to the adoption of innovations in the newsroom." Ultimately in order to examine and consider AI as a feasible option within news media, theoretical implications and concepts must be examined in tandem with the actual facts of operation for news media organisations. For example, AI still requires specialised expertise rendering smaller news organisations with less available resources and staff reliant on the whims of 'big-tech' (de-Lima-Santos and Ceron, 2022). With news organisations struggling "for profitability, market share, journalistic reputation, and readers" (Dörr, 2015:700) the introduction of new potentially transformative technologies offers an opportunity for positive change. Anderson et. al. (2002) suggest that although the changes brought about by AI may be wrenching as they "affect both the daily routine and self-conception of everyone involved in creating and distributing news," (42) without them "the future holds nothing but doing less with less."

The immediate assumption in considering the introduction of AI technologies "often has to do with how they influence the presentation of the news" (Bucher, 2018:127) However, AI can function to serve a number of purposes across news organisations, including both for editorial and operational purposes. Stray (2019:1078) identifies the use of AI by a number of organisations to "solve a variety of business problems" including predicting virality of stories, maximising subscriptions, and minimising churn. One important delineation to maintain in considering business perspectives in AI deployment is the distinction between AI for journalistic purposes and for marketing. A frequent use for AI technologies is in personalization, determining what stories will be of interest to a reader and personalising the content to them. However, as Hansen et. al. (2017:11) establish, there is a fine line where journalism bleeds into marketing and as such we need to be "very aware that

too much personalization crosses the line into a different activity.” Such dialogue remains reminiscent of the iconic quote attributed to newspaper mogul Lord Northcliffe; “News is something somebody doesn’t want printed; all else is advertising” (Ibid:11).

A further business perspective to consider in analysing AI, is its potential effect on the value chain traditionally established within the news and journalism industry. Traditionally the value chain creation process in the news industry has been “firm-centric and independent... with little social interaction with consumers” (Jose Hernandez Serrano et. al., 2015:314). However, new digital algorithmic technologies such as AI makes media tailored to individual preferences more available to the general public. Such change drives a shift away from a product and firm-centric view towards a personalised consumer experience, in which consumers hold power and the market focus is reassigned as a “forum for conversation and interaction between consumers, consumer communities, and the firm”. (Ibid:314) Ultimately the introduction of AI promises changes not only in regards to the operational processes of news organisations, but in their very makeup, with a reorientation of values, perceptions, and consumer interactions.

Creating Strategy

The introduction of new technologies in media is sometimes “characterised by a romantic rhetoric of creative disruption... yet generally newsrooms do not have the time or resources to allow for free-wheeling risky adventures” (Beckett, 2019:37). As such a critical piece in adopting AI technologies, whether for editorial or operational purposes, is in establishing digital and technological strategy. According to Beckett (Ibid:38), the development of innovative strategy is a new challenge for news organisations, many of whom have been reliant on unchanging business models and technologies for over 50 years. Further, some organisations face difficulties in formulating strategy due to the unpredictable and uncertain nature of technological advancements which can make it challenging to envision the future of digital news (Pauluessen, 2016:194). Past attempts of digitalization have been limited due to a “lack of tradition in experimenting and investing in technology and digital talent” (Ibid:194) resulting in an inability to even install strategy until change is not just desired but required. As Anderson et. al. (2012:33) establish; “merely bolting on a few new techniques will not be enough to adapt to the changing ecosystem.” Rather, the adoption of disruptive technologies requires change at an organisational level beyond just the adaptation of individual employee’s skills. Beckett’s research among media organisations in 2019 found

that only a “small minority had specific AI plans, while the majority were pursuing a more ad hoc approach” (Beckett, 2019:32). Given the pace of AI innovation in the years since Beckett’s research the number of organisations with established AI strategy has likely grown, although the fact of this rapid change in only a few years goes to prove how little prepared many organisations truly were.

Obstacles to Application

Despite the potential promise of AI, there remain several obstacles to the practical adoption of the technologies into newsrooms. De-Lima-Santos and Ceron (2022:1417) identify as among these challenges a “resistance to change, the institutional landscape, historical competition, insufficient funding, a lack of skill, and complementary ambitions.” Such obstacles are not entirely exclusive to the experience of AI however. The news industry has typically been slow to accept technological innovation and suspends a “dialectic between technological scepticism and utopianism” (de-Lima-Santos and Mesquita, 2021:1417) that renders most innovation as incremental. This resistance to change is embodied in a culture towards innovation “marked by reactive, defensive, and pragmatic traits” (Boczkowski, 2004:192) in which newspapers only encourage innovation and experimentation in an attempt to play catch up to competitors (Paulussen, 2016). Ryfe (2021) identifies newsrooms as suffering from a “yes, but...” syndrome, in which journalists identify digital challenges but provide excuses for avoiding dealing with them. In fact, as Paulussen (2016:195) identifies, changes are largely driven by a desire “to copy the new things that others are doing,” rather than genuine innovation in practice, which renders most changes the result of “small-sized ad hoc projects” in order to mimic and play catch-up to ongoing trends.

Another obstacle to AI adoption arises in the attitudes felt towards the field. Bucher (2018:128) identifies that in the arrival of algorithms several years ago, news media professionals were faced with the choice of either “developing a proactive stance, or reactively adapting to the new technological landscape.” Despite the long standing integration of more subtle automotive technologies into the newsroom, many journalists still face the outright introduction of AI with “mixed feelings, including distrust and fear” (Linden, 2016:123). Linden identifies this fear of technology as an unchanging element of newsrooms, with examples of “resistance, mitigation, and adaptation” (Ibid:123) evident from the introduction of the computer onwards. A further obstacle stems from the basic fact of a lack of available resources, both in terms of money and technological infrastructure. Past

technological introductions have seen friction between technical and editorial staff regarding bugs and issues with the new technology, with the knowledge and communication gap between technologists and the journalists using the software risking resulting in journalistic malpractice (Hansen et. al., 2017). This knowledge gap itself poses issues in the adoption of AI, with a fear that “insufficient and inadequate coaching and training” (Örnebring, 2010:14) among staff using the technologies could result in their misuse or premature abandonment. A further issue in terms of training arises in ‘brain-drain,’ as those who do become familiar with the technology and further tech-skills “leave for higher paid tech industry jobs” (Broussard, 2019:678). Stray (2019:1087) identifies that while “the average “reporter” salary is around \$50,000 while the average “artificial intelligence engineer” is closer to \$150,000.” As such, AI talent developed in newsrooms may feel a pull away from the news industry in order to better compensate their skills elsewhere.

Actors

Analysing the adoption and integration of AI requires the scrutinization of organisations as critical actors in this process. In order to fully illustrate how AI interacts with the news media industry we must investigate components of organisational influence on AI development and deployment. These include cross-organisational collaboration, the structural arrangements and ownership of news organisations, and accountability for the technical advancement of AI.

Collaboration

One fact of the innovation and introduction of AI has been an increase in cross-organisation collaboration, whether between key actors such as organisations who would otherwise work in competition for viewership and engagement, or with independent NGOs or tech companies. As Anderson et. al. (2012:43) identify, perhaps one of the most “exciting and transformative aspect of the current news environment is taking advantage of new forms of collaboration,” with efforts to find new and innovative uses of AI transcending organisational boundaries. Elements of collaboration are also seen with organisations beyond the news industry. Many organisations see their current innovation in AI funded by groups such as Google’s Digital News Innovation grant or the Knight Foundation. The particular relationship of technology companies and news organisations is regarded by some as a relationship of “frenemies” (de-Lima-Santos and Ceron, 2022:19) as “on one hand, tech

companies broke news media's business models; on the other hand, big tech platforms have become a major source of funding and a disruptor of innovation in the news industry."

Organisational Structure

When analysing any aspect of media organisations, it is essential to consider them in their role as institutions that serve a particular purpose for society. As Dörr and Hollnbuchner (2017:409) distinguish, "journalism is traditionally produced on the organisational level within media organisations according to specific rules and routines or by other journalistic actors on a professional level." Examining the development and functions of journalism in our digital society requires analysis of "how individual behaviour coincides with larger, cross-organisational structures" (Steensen and Westlund, 2021:60). As Carlson (2019:417) remarks, "non-technological organisational and professional factors complicate journalism's relationship with technology," with the adoption of technology not only reliant upon individual journalist's attitudes and willingness, but also broader organisational factors. To return to Anderson et. al's proposal (2012), the integration of AI technologies is not just a matter of bolting on new techniques, but rather requires a change in organisational structure in order to fully utilise access to individuals, groups, and machines. Dörr and Hollnbuchner (2017:414) remark that with the introduction of the techniques and technologies of algorithmic journalism and AI, "the importance of the individual," meaning the human journalist, "is diminishing, whereas the importance of media organisations and the media system as moral agents is rising." Schudson (1989:269) has long remarked that "fewer and fewer corporations control more and more of the American news media," with organisations awarded increasing power in the processes of media production and publication. With events such as the introduction of AI it remains of utmost importance to interrogate the structural facts of these organisations, and examine how institutional norms and constructions guide the integration of new technologies. As Gillespie (2014:176) remarks, "any knowledge system that emerges amid the economic and political aims of information provision, will be shaped by the aims and strategies of those powerful institutions looking to capitalise on it." Given the ever increasing dependence by news media organisations on "advertising for profits... (and) government officials for sources," (Schudson, 1989:269) we must continue to engage critically with the decisions made at an organisational level, and consider possible ulterior motives.

Diakopoulos (2015:29) remarks that the past several years have seen a shift “toward transparency as a core ideal of the journalistic enterprise” resulting in increasing tensions between “the ideal of transparency and the reality of” algorithmic technologies such as AI. As Anderson et. al. (2012:33) state “traditional news organisations have tended to conserve both working methods and hierarchy, even as the old business models are collapsing, and even when new opportunities do not fit in those old patterns.” As such, the integration of technologies such as AI requires not only changes on an operational level, but a reorientation of the very values and processes that we consider as core to news organisations. The restructuring required in adopting these technologies and techniques demands rethinking and rebuilding processes of news production at an organisational level; addressing elements that Anderson et. al. (Ibid:42) identify as ranging from “increased openness to partnerships; increased reliance on publicly available data; increased use of individuals, crowds and machines to produce raw material” to even increased reliance on machines to produce output.

Technical Development

When analysing the use of AI technologies within news media organisations it is important to engage with the fact that “many of the computational tools that journalists are using today were not developed for the profession” (Hansen et. al., 2017:5). Often technologies instead come from the fields of computer science, statistics, and engineering, having had their original intention for use adapted, or having been developed for general purpose use. AI technologies alongside algorithms and databases are often regarded as a “single, working apparatus” (Gillespie, 2014:169) and in the “eyes of the market, the creators of the database and the providers of the algorithm are often one and the same, or are working in economic and often ideological concert.” To contextualise this within the frame of the news industry, while news organisations themselves may provide the ‘database,’ meaning data such as audience information used in composing the final function of the product, the ‘providers of the algorithm’ are more likely to be third party providers responsible for the development of the technology and programming of the algorithm. This separation can risk a degree of ideological difference and risks to data privacy, with a fear of journalistic malpractice as a result. De-Lima-Santos and Ceron (2022) identify an often reliance of news organisations on third-party groups, whether that be large technology corporations, individual software providers, or occasionally platforms such as Google’s incubator *Jigsaw*, in order to receive assistance in developing AI solutions and implementing software. In their

recommendations for beginning AI deployment in news media organisations, Hansen et. al (2019:3) suggest that while custom-built AI is often “too expensive for smaller operations to afford,” that smaller-scale newsrooms should “consider investing time in partnerships with academic institutions,” further emphasising the range of third-party groups organisations can come to be reliant upon, especially at a smaller or local-level of newsroom. A reliance upon larger technology companies risks a potential for them to “leverage control over AI” within the news media space. (de-Lima-Santos and Ceron, 2022:17) Despite the attempts of many news organisations to strengthen their in-house capacity to drive technological innovation and expansion we once again return to the obstacles of limited available resources and staffing issues such as brain-drain that imposes a hindrance upon efforts.

Implications

The news and journalism industry is a place “in which the emergence of computation, machine learning, and data science have wide-reaching and persistent consequences” (Bucher, 2018:120). AI can drive a number of changes through its ability to regulate engagement, disseminate information, influence human emotion and response, and either eliminate or reinforce societal biases. However, the technology becomes an issue not only if it interferes with people's livelihoods and passions, but at the immediate point at which it is embedded with people's concerns and thus comes to a point of problematization in its adoption and acceptance (Ibid.). As such, in order to consider the range of implications that stem from AI, this stage examines the considerations required in executing responsible AI use; the potential effects of AI use at individual, organisational, industrial, and social levels; in addition to examining the key concepts contained within generating responsible AI use and regulation. Concepts experienced in the implications stage of the framework, such as labour and automation and ethics, are felt across the themes of considerations, effects, and regulation, but for ease of presentation are featured below with the theme they are felt in closest connection to.

Considerations

Labour and Automation

AI, as an automotive technology, is recognized as embodying “values pertaining to labour and capital, with implications for workers and society” (Guzman, 2019:682). Some

perspectives assert that technology has been used to assert power over news production processes, increasing the amount of work that journalists are expected to complete in decreasing amounts of time (Örnebring, 2010). Historically, the predominant technology of use to journalists has been writing, with technical skills necessary for the organisation, production, and presentation of news separated from the labour of journalism itself (Ibid:68). Since the introduction of the printing press we have seen an increasing division between the conception and execution of journalistic labour representing the “gradual disconnection of the technology of printing from the actual news-gathering labour” (Ibid:63). However, with the digitalization of news media and journalistic processes, journalists have been increasingly required to become technologically adept and diversify their skill sets into areas such as self-publication and social media management. Anderson et. al. (2012) propose this phenomenon as an example of post-industrial journalism, in which we see “journalism no longer organised around the norms of proximity to the machinery of production,” (42) with news organisations and individual journalists required to adopt new digitally informed working methods and processes in order to maintain profits and relevance.

An immediate fear of AI is that it threatens automation to too extreme a degree, particularly in relevance to peoples’ jobs and livelihoods. When we examine the topic of AI’s effect upon news and journalistic labour, we need to hold such considerations within larger historical contexts, given that the conflict between technology and labour has been ongoing since the very beginning of the industrial era. There has long been an argument that “technological developments are used under monopoly capitalism to displace labour from high-productivity industries to labour-intensive industries” (Braverman, 1974 in Örnebring, 2010:60). However, I would counter this argument with the fact that empirical findings suggest the “general trend is upskilling of the workforce, as skill demands in most jobs increase” (Ibid.). In fact, multiskilling, upskilling, and downskilling often occur simultaneously, as journalists “become more skilled in digital production techniques, they may find less use for their news-gathering and collating skills,” (Ibid:67) emphasising that digitization and the introduction of technologies such as an AI does not necessarily imply a net-positive nor negative effect, rather a shift in the values of news organisations in relation to labour that may be differently interpreted from individual to individual.

Ethics

If we are to understand ethics as a "branch of philosophy that addresses the morality of human actions" (Dörr and Hollnbuchner, 2017:405) and to consider ethical behaviour as actions that lead to the common well-being of all, the discourse on ethics regarding AI and its intersection with news media primarily pertains to human conduct in the use of AI technologies and the assurance that the use of these technologies is advantageous for humanity, rather than serving as a means of oppression. Ethical challenges arise on various levels with the intrusion of AI into news media organisations. With the increasing complexity of these technologies we see a broadening gap between "the design and operation of algorithms and our understanding of their ethical implications," (Mittelstadt, 2016:2) thus risking consequences not only at an individual or organisational level, but for greater society as well.

As Broussard (2019:678) determines "every technological system reflects the conscious and unconscious bias of its makers; AI is no different." Diakopoulos (2019:679) further emphasises that all technologies "embed and encode human values... AI systems are tools built by humans to serve human means and ends. They are profoundly political, exuding the values that designers and developers build into them." A range of human influences are embedded and encoded into AI technologies, including "criteria choices, training data, semantics, and interpretation" (Diakopoulos, 2015:10). As such, academic study must hold AI within its contexts as a product of human action, recognizing the processes that may have influenced its design, and ultimately ensuring that it is humans that are centred in the socio-technical conversation that surrounds AI (Broussard, 2019).

The idea that algorithms and AI technologies are more impartial than humans themselves is a designed fallacy that serves to conceal the fact that such technologies are as much a product of their creator as any other. Given that our society is often a deeply unjust one, pitched against many as a fact of their race or gender, resultantly "discrimination is embedded into computer code and the artificial intelligence technologies that we are reliant on, by choice or not" (Noble, 2018:1). Examples of this embedded bias and discrimination are abundant, such as an automated algorithmic formula in use by several American justice systems that is "particularly likely to falsely flag black defendants as future criminals, wrongly labelling them this way at almost twice the rate as white defendants" (Angwin et. al., 2016). Noble (2018:1) particularly voices fears for women and people of colour, two groups

largely underrepresented within technological companies and development teams, as it may become “increasingly difficult for technology companies to separate their systematic and inequitable employment practices, and the far- right ideological bents of some of their employees, from the products they make for the public.” As such, particularly in the introduction of AI into journalism and news media production, careful thought must be taken in the consideration of reducing the effects of encoded bias and ensuring diverse representation.

Part of the ethical queries surrounding AI is relevant to data and data usage. Ultimately data is an undercurrent through any and all elements of AI, ranging within the context of news media from audience and viewership data, to story data, to data on the very language and tone constructing stories. As Gillespie (2014:170) distinguishes, “data is both already desiccated and persistently messy” making its management and preservation a distinctly un-straightforward process. Current large scale data mining efforts are increasingly being deployed not only in journalism, but in fields such as political organising and publishing, with data not only used to map the landscape of an entity’s audience but in actively shaping our social, cultural, political, and economic interactions and experiences. As we manoeuvre AI into news organisations and journalistic processes we need to confront issues such as the ethically sound processing of data delicately, and engage critically with conversation surrounding data usage and regulation. Questions regarding data are no longer “situated at the individual level of responsibility” (Dörr and Hollnbuchner, 2017:412) as they once were in the realms of traditional journalism, but rather a responsibility at an organisational and industry level.

Power and Control

Beyond allowing us to access information and acting as administrative tools, AI and algorithmic technologies “provide a means to know what there is to know and how to know it, to participate in social and political discourse, and to familiarise ourselves with the publics in which we participate” (Gillespie, 2014:167). AI is not only inflected with reflections of our own political systems and relationships of power, but through its use comes to possess its own power and politics (Bucher 2018.) With “operations, decisions and choices previously left to humans increasingly delegated to algorithms” (Mittelsdat et. al., 2016) we award these mechanical systems power over our social being and interactions. Particularly in integration to news media and journalism, the filter through which many receive their political

messaging and beliefs, we risk awarding particularly political power and governance to AI technologies, and must engage critically with their potential political ramifications (Crawford, 2016).

Digital technologies have already transformed the landscape of journalism, having “undermined business models, rebalanced the relative power of reporters and audiences, and accelerated the delivery of information worldwide” (Hamilton and Turner, 2009:2). Dialogue around the transformative power of AI, and particularly its role in designating what is newsworthy and what is not, is reminiscent of debates throughout the twentieth-century on the ways that the decisions of commercial media “shape the diversity and character of public discourse” (Gillespie, 2014:172). With the introduction of AI we see this process automated and even further obstructed from public view. Insight into the workings of these technologies is in-itself a form of power, as those with the know-how are awarded the opportunity to manipulate algorithms in their favour and engage intimately with the technology and its developers, enabling an innate power imbalance associated with the technology.

Effects

Journalistic norms and practices

The previous intrusion of digital technologies, and now the entrance of AI, have significantly changed processes of journalism and news production, development, distribution, and consumption, in addition to the values, practices, and norms of individual journalists and wider organisations. As Dörr and Hollnbuchner (2017:404) emphasise “journalism and its production routines and conditions have always been shaped and influenced by technology.” Usher (2014) argues that the technological innovations of the past several decades interact with a broader shift to emphasise the three values of immediacy, interactivity, and participation as core to the news production process. AI technologies have become an increasing part of the public consciousness, and indeed in discussion around journalism, making “themselves known as both remedy and harm” (Bucher, 2018:146). The introduction of disruptive technologies to newsroom and journalistic practices has induced change at an organisation level and upon individualised journalistic culture and work (Anderson, 2012). Studies of nearly all new technologies, from the computer onwards, display instances of “resistance, mitigation and adaptation” (Linden, 2016:126) towards the technology indicating that the attitudes experienced towards AI are not an entirely unique

phenomenon. This phenomenon can be understood as a process of *normalisation*, as entrants to the profession “learn and adopt the routines and unwritten rules of newsgathering and production,” and ingrain these said routines, processes, and practices into daily life, which in turn acts as a hindrance to disruptive innovation that challenges facets of learned behaviours (Örnebring, 2010:198).

AI has the potential to “overcome the ethical challenges of the conventional media system. It may unburden the human journalist from daily routine work, it may reduce economic pressure and the dictate of quantity. It frees up capacities for in-depth analysis and reporting and thus enables journalists to consider moral demands in journalistic work like checking multiple sources, reflection, diligence, respecting human dignity, etc” (Dörr and Hollnbuchner, 2017:414). Through decades of experience journalists have devised techniques in determining what to report and when, assigning value through systems that, though designed to be reduced in bias, can never be entirely divorced from their own personal values and beliefs. (Gillespie, 2014:181) The introduction of AI and the dialogue that surrounds it “raises questions striking at the core of how journalism should be understood,” (Carlson, 2019:429) and allows us to interact with and integrate the core institutionalised practices of news media organisations. As Diakopoulos (2019:679) emphasises, the introduction of AI “suggests an opportunity for journalists and news organisations to become aware of and exercise their ability to embed their own organisational, institutional, and professional values into the technologies that then drive news production,” provoking a shift in elements of journalism and news production otherwise viewed as familiar givens.

One key practice subject that AI specifically encourages is that of speed. In the contemporary news industry, “productivity is taken to be synonymous with more news faster, or even preferably more news first” (Örnebring, 2010:65). Discourse around speed and its disruption of traditional production routines has taken increasing precedence with the introduction of 24-hour news cycles and social media, becoming a “wholly naturalised element of journalism and forms a template for how journalists understand new technologies,” (Dörr, 2015:707) viewing their predominant function as speeding up news processes. Another shifting practice within news media organisations is the transformation of value creation strategy from attention to trust, particularly following the fake-news scandals of the past several years (Jose Hernandez Serrano et. al., 2015). We have seen an “increased emphasis on institutionalising practices of fact checking and information verification” (Steensen and Westlund, 2021:5) resulting in investment and interest into potential

technological solutions such as AI. As Beckett (2019) distinguishes, fact checking organisations such as *Chequeado* and *Full Fact* have long employed machine learning techniques for fact verification and claim detection, indicating the promise of AI technologies in the field. AI promises impact upon a series of other journalistic practices, including workflow, as “AI can help free writers from having to constantly re-write the same stories over and over to work on more original reporting,” (Hansen, 2019, 8) and creativity, as the introduction of AI offers an opportunity to “entirely re-imagine reporting” (Stray, 2019:1088).

Regulation

Transparency and Accountability

Transparency, as it relates to power as affected by AI, is of particular importance when related to “a consequence or decision made by the public—so that whether voting, buying a product, or using a particular algorithm, people are making more informed decisions” (Diakopoulos, 2015:11). Legal scholars have long argued that “automated processing requires more transparency, but it is far from obvious what form such transparency should take” (Kroll, 2017:638) and with the current rapidity of AI evolution any official regulation or guidance seems quickly outpaced. Many algorithms are described as black boxes, with their complex technical nature functioning to obscure their internal mechanisms, however care must be taken in not allowing this perspective to dominate the entirety of AI (Diakopoulos, 2015). Assuming AI as a black-box obscures “a critical understanding of exactly what decisions are being made by the software,” (Hansen et. al, 2017:16) and resultantly journalists, and indeed any user of AI technology, should engage critically with the technology and its output, questioning the process through which it was generated. As Hansen et. al. (2017:2) assert, “readers deserve to be given a transparent methodology of how AI tools” are used within journalism. An argument could be made for publicising source code in the name of transparency, however for the average member of the public this information will make little sense beyond appearing as a random chain of numbers, thus further perpetuating the exclusion of non-technical experts from interaction with the technology (Kroll, 2017). Diakopoulos (2015:12) suggests a solution to this problem may be in the development of methods of transparency that present the workings of AI in an “an understandable and plain-language way, perhaps with multiple levels of detail that

integrate into the decisions that end-users face as a result of that information,” encouraging a movement towards accessible AI literacy across all areas of society.

Particularly in incorporating AI into news and journalism for editorial purposes we are faced with a number of questions regarding accountability (Steensen and Westlund, 2021). When using AI “care should be given to explain exactly when, how, and where it is used” (Hansen et. al., 2017:14) not only to allow transparency for the audience, but also to engage with accountability over not only its use, but also its errors. As Steensen and Westlund (2021:37) distinguish, “news publishers are responsible for the news they publish, and it can become very problematic if they use AI technology to report misinformation, especially if the ownership of such non-proprietary technology is associated with political or economic interests.” As such a standard of disclosure must be established alongside the use of AI tools, with efforts both internally and collaboratively between organisations to establish best practices and more robust regulation. Given the novelty of this technology there is little in the way of concrete legal regulation. As it currently stands, actors, whether at an organisational or individual level, have to begin constructing guidelines that adhere to moral and ethical standards (Dörr and Hollnbuchner, 2017). As Liu and Zheng (2022:157) emphasise, the “first thing to do is to formalise the ethical norms of AI and embed moral standards and ethical reasoning rules into the underlying algorithm framework of AI as operators.” Establishing ethical norms will eventually lead to formalised regulation, as “discourses based on values become the forerunner to legal regulation” (Hydén , 2020:421). While ethical norms may not hold legal weight, they are “persuasive in nature... and have been observed to have significant practical influence on decision making” (Jobin et. al., 2019). Further, there is little to no regulation or legal standards to govern abuse of power in this way either, with the “tools currently available to policymakers, legislators, and courts developed primarily to oversee human decision makers” (Kroll, 2017:636) and with little to no applicability to algorithmically governed technologies like AI. While AI as a technology is largely governed by numbers and scientific data, regulation at this point must take a far more humanistic approach, with a focus on asking if we *should* rather than indulging in seeing if we *can*.

Methodology

The purpose of this paper is not to argue for either the inclusion or exclusion of AI technologies from news media production processes, nor is it to tout positive nor negative effects of AI. Rather, the intention here is to map the current landscape of AI within news media, and look to building methods of academic study and analysis for these technologies. Qualitative research methods lend themselves to such a focus, with an emphasis on lived experience and opinion, over the reams of numbers and data that one might typically associate with the realm of AI and algorithms.

Methodological Approach

As alluded to in the introduction of this work, artificial intelligence is a relatively novel and expansive field, innately fluid in its definition, and subject to change on a near-monthly, if not weekly basis with the release of new technologies. As Jensen (2002:236) emphasises, qualitative research is an “iterative process.. which allows for the flexible application of theoretical concepts and analytical procedures.” It is this flexibility that adheres qualitative research as a well suited methodology for the sociological study of AI and its implications, particularly through the lens of media studies. Such flexibility, with the ability to tailor interview questions to the particular interviewee and their knowledge, allows us to account for the varied experiences of AI across the news media industry, and begin construction on a holistic view. Qualitative approaches function as a “scientific means of coping with a new form of social reality” in which we have seen an “erosion of traditional social patterns and the rise of mass communication as a primary source of social cohesion” (Ibid.). If we are to view artificial intelligence as the new frontier in mass communication, and indeed a key piece in the newest form of social reality, then comprehensive and contextual qualitative modes of understanding are in fact the best suited theoretical and methodological approaches for investigating the field.

Perhaps what best matches methods of qualitative research to this thesis’ method of study arises from the fact that AI does “not exist in a vacuum... (it is) always built and embedded into the lived world, at the level of institutional practice, individual behaviour, and human experience” (Bucher, 2018:120). Using qualitative methodology we are enabled in considering the subjective experiences and meanings of AI’s presence in news media, in addition to the contextual factors that shape its appearance and significance, rather than solely

analysing the frequency of its appearance. Qualitative approaches examine “meaning production as a process which is contextualized and inextricably integrated with wider social and cultural practices” (Jensen, 2002:4) allowing us to position our exploration of AI within broader contexts, as not only perceptions of AI but the actual construction of interview responses remain “reflexively situated in the wider cultural arena” (Rapley, 2004:16).

Semi-structured Interviews

The justification in choosing interviews as the predominant research method for this thesis lies in the simple idea that “the best way to find out what the people think about something is to ask them” (Bower, 1973 in Jensen, 2002:240) Interviews allow us a view to not only the state and shape of AI in news media, but also the opinions and views of those who work with the technologies on a frequent basis. Further, as a master’s student my actual lived experience with AI and its deployment within a top news media organisation remains limited at best. Interviewees can draw on their specialist knowledge and “report on a wide range of situations that he or she has observed, so acting as the eyes and ears of the researcher” (Seale, 2018:202) and thus grant insight into an actual applied experience of AI beyond the theoretical wonderings one can otherwise draw from research papers. Interviews can be viewed as an opportunity to “gaze into the soul of another,” (Atkinson and Silverman, 1997:305) or perhaps less lyrically, an opportunity to determine not only what an interviewee says but what they mean.

To elicit participants' diverse experiences and perspectives on the deployment and effects of AI within their own organisation and beyond, it stands to adopt a flexibility in interview approach. As Seale (2018:205) suggests, an interview process that evolves questions throughout the process of the interview, rather than strictly adhering to a predetermined set, is a more effective method in capturing subjective perspectives and experiences. This approach “enables you to gather contrasting and complementary talk on the same theme or issue,” (Rapley, 2004:18) thus fully illustrating the diversity of thought and experience surrounding the topic at hand. Therefore, while I did produce a template of questions with which to begin interviews, interviewees would often display a knowledge or interest in a specific area of discussion, and so by encouraging the interviewee to further explore this area I enabled a richer quality of response. The flexibility of semi-structured interviews minimises “the extent to which respondents had to express themselves in terms defined by the interviewers and encouraged them to raise issues that were important to them”

(Shiner and Newburn, 1997:520) thus making it an especially fitting method in determining participants individual connotations, perceptions, and experiences. In allowing interviewees to drive the direction of the interview, and adapting follow-up questions in response to their demonstrated areas of interest or knowledge, participants could express their experiences, norms and values, in terms meaningful to them (Stephens, 2010). Through establishing guiding questions I ensured the interview covered the topics necessary to the project with largely improvised further probing allowing for a greater depth and detail in response.

Research Design

An interview guide was created in parallel with the framework developed for the analysis of AI in news media. I developed guiding questions that fell into three themed sections, borrowing from the parent stages in the framework: applications, implications, and actors. Questions in the application stage concerned the actual AI technologies in use or development at their organisation and their perceptions of such technologies, in addition to questions surrounding the readiness of news media organisations for AI and obstacles to deployment. The actors theme related to the users of the technology, and around the structure of the organisation itself. Finally, the implications stage broadened consideration to the potential effects of AI on the news media and journalism industry, alongside the ethical responsibilities and challenges of AI. Beyond key questions I also noted several further sub-questions that could be used to probe further in the interview, and would additionally create complementary questions through the interview. In preparation for each interview I reviewed the interview guide, and highlighted questions of particular relevance to the specific interviewee that I determined through research on their background and previous work, alongside adapting some questions to particularly target their area of expertise and interest.

Interviewing the Elite

Stephens (2010) defines the elite as those in a position of either power and raised social stature, whether that be “relative to the researcher conducting the interview... or relative to the average citizen in society.” Other lines of thought, such as that of Littig (2009), argue for a distinction between the categories of elite and expert, with elite defined as “the influential, the prominent, and the well informed” (Dexter, 2006) whereas experts can be understood as individuals with “privileged access to the knowledge of specific groups of people or decision-making processes” (Littig, 2009). All of my interview participants offered

a wealth of knowledge and combined decades of professional experience within the news media industry, thus immediately qualifying them as experts on the topic. However, as Littig (2009) emphasises, experts are not necessarily those who make “high-level decisions at the top of an organisation.” As such, if we are to use this definition to delineate experts from elites, I would propose that this additionally defines the majority of my interviewees as elites, and further *professional* elites, given their senior roles within some of the most globally eminent media organisations (Odendahl and Shaw, 2002).

In the interviewing of elites, researchers propose several considerations that must be taken into consideration in research design. Perhaps the most pertinent to my research is the gaps of age difference and experience between me, as a masters level researcher, and my interview subjects. Odendahl and Shaw (2002, in Stephens, 2010) suggest this gap can make it difficult for a researcher to be taken seriously. Stephens (2010) further emphasises that a lecturer/student dynamic can befall interviews between young researchers and the professional elite, as the interviewee may “frequently lean towards teaching technical issues (on the interview topic) as opposed to placing values upon them.” However, I would assert that these considerations were largely a non-issue through the course of my research. The interview subjects all appeared confident and spoke freely, with many actually expressing thanks for the opportunity to speak about their work and express their passion and interest in AI. The lecturer/student dynamic was also not at play, which I would account to the assumption from my interviewees that as a student focusing in AI I already had a degree of technical knowledge in the field.

Sampling and Interviews

In preparation for my research I identified a desire to speak to key actors in the intersection of AI technology and news media. Further, I specifically wanted to speak with those not only with technical knowledge and experience with AI, but also experience in the strategy and deployment of AI technology, and thus familiarity with the broader implications of AI within their organisation, and also across the industry and wider society. In order to contact potential participants I took to professional networking platform LinkedIn. I identified individuals in senior roles at news media organisations globally, who work with some degree of connection to technology or AI, and sent them a message introducing myself and my research and asking if they would be willing to participate. This method of sampling evolved elements of snowball sampling, which assists in ensuring that participants retain

“characteristics of research interest” (Biernacki and Waldorf, 1981), as once I began interviewing participants they would often recommend others who may be willing to participate—some of whom I was in fact already in contact with. The familiarity between many of my participants also illustrated the still relatively small size of the AI and news media world, with professional networks remaining intimate at this stage of technological development. At one point I discovered that two of my interviewees were participating in a panel at South by Southwest SXSW (Ellis et. al., 2023) on AI in the newsroom, and through this panel was able to identify an additional interview participant. I began my research with the aim of interviewing 5-8 participants from high profile organisations. In an attempt to account for an amount of non-replies and unavailability due to busy professional schedules I contacted 25 potential participants, of which around 9 responded, and with 7 of whom I was able to arrange interviews. See Fig.1 below for a table detailing the participants of the research interviews. All participants consented via writing to the use of their names in the paper, aside from one of the participants who expressed a desire to have their name and role have been anonymized to “John,” a senior technology manager at RTÉ.

Interviews were arranged via meeting booking software Calendly, through which participants could select a time and date that suited their schedule. This served to accommodate the interviewee’s often busy schedules, a factor that attests to the “importance of flexibility in time-tabling interviews with members of busy elites” (Morrissey, 1970, in Stephens, 2010). I further accounted for this flexibility by hosting interviews via video conferencing software Zoom, which allowed my interviewees to participate regardless of their location, and also granted me a global scope in my research. The unpredictable nature of technology and internet connection occasionally posed obstacles in the digital interviews. For example, during my interview with Laura, the Head of Technology Forecasting at the BBC, an issue with internet connection at around the 15 minute mark of the call resulted in a disconnection, which further resulted in the audio recording of the first two question responses being lost. However, Laura kindly later emailed me notes on her response to this question, so I was still able to examine a response to these questions within her own words.

Name	Role	Organisation	Country	Interview Date	Interview Length
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Grant Totten	Head of Cloud, Analytics, and Insight	Al Jazeera	Qatar	14/3/2023	00:38:32
Laura Ellis	Head of Technology Forecasting	BBC	United Kingdom	17/3/2023	~ 00:38:44
Aimee Reinhart	Local News AI Program Manager	The Associated Press (AP)	United States	28/3/2023	00:35:42
Mikaela Åstrand	AI/ML Engineer	SVT	Sweden	3/4/2023	00:38:13
Richard Waghorn	Chief Technology Officer (CTO)	RTÉ	Ireland	28/3/2023	00:39:40
John*	Senior technology manager*	RTÉ	Ireland	28/3/2023	00:39:40
Dalia Hashim	AI and Media Integrity Lead	Partnership for AI	Canada	5/4/2023	00:35:38

Fig. 1: Interview Participants, *name and role anonymized for privacy

Analysis Methods

Following the completion of an interview, I transcribed the interview via Microsoft Word's audio transcription function, and then reviewed the transcription against the audio to ensure that the transcription script was accurate. The interview transcript was then exported

to the CAQDAS (computer assisted qualitative data analysis) software NVIVO, through which I could digitally code my research data. The benefit of using a digital software such as NVIVO is that it draws “methodological attention to the process of coding” (Kelle, 2004) research materials, while the software assisted methodical coding allows researchers to “find evidence and counter-evidence more easily.” Throughout the analysis process I reviewed each interview upwards of six times, with the first read throughs acting as a general review and checking the effectiveness of transcription, then an initial coding review, followed by a secondary coding review

Coding and Analysis

The interview data underwent analysis following the AAI framework I developed for analysing the adoption and integration of AI by media organisations. In embarking in the creation of my framework, I aimed to allow for consideration of these said political, economic, cultural, and social constructions, without constraining to a solely constructionist approach, nor embarking into a determinist position. I selected the parent codes of applications, actors, and implications because of their ability to provide a comprehensive framework for holistically analysing the various factors and processes involved in AI adoption and interaction, without limiting the scope solely to technical elements nor social contexts. Beyond the three parent codes, each division contained 3 child codes further detailing themes of the interviews. The *applications* stage enables insight into the *perceptions* of AI, the *strategy* necessary in introducing it into organisations, and the potential *obstacles* to deployment. The stage of *actors* allows us to explore organisational factors that guide development and deployment such as cross-organisational *collaboration*, the *organisational structures* themselves, and the *technical development* of AI. Finally the stage of *implications* examines the impact of AI, such as the *considerations* that must be made in using the technology, the *effects* of the technology, and the steps that must be taken in creating *regulation*.

I began analysis with a method of deductive coding, having pre-established my framework and various child codes with which I guided my analysis, established through reading and themes I hypothesised would be of particular relevance to organisations adopting AI. However, when undertaking my analysis I identified additional patterns and themes in my research data, and so by creating additional coding while in the process of analysis, I shifted from a wholly deductive coding method to one combining both deductive and inductive

coding (Kuckartz, 2014). After completing the coding process, I observed that some initial coding categories were not as relevant as I had anticipated, while others appeared to be more relevant when combined with other categories. As a result, I chose to either exclude the less relevant categories from my final analysis and findings or merged them with other codes, such as absorbing technical descriptions into the category of perceptions. I also coded key quotes throughout the process which, whether or not they neatly slotted into a child code category, I knew were of note and could be integrated into analysis at one point or another. Fig. 2 demonstrates the combined deductive and inductive coding scheme I used in my initial analysis, versus the concentrated coding scheme I evoked in my final analysis and findings.

Draft Analysis Coding Scheme:	Initial Analysis Coding Scheme:	Final Analysis Coding Scheme:
<ul style="list-style-type: none"> ● Applications of AI technology <ul style="list-style-type: none"> ○ Technical descriptions of the AI technology ○ Use case of AI ○ Perceptions of AI ○ Restraints / obstacles to roll out ● Actors involved in AI technology use <ul style="list-style-type: none"> ○ Who uses AI technology in news media organisations ○ Organisation itself ○ Development of technology ○ Cross organisation collaboration ● Implications of AI technology use <ul style="list-style-type: none"> ○ Effects of AI technology ○ Considerations for use ○ Within company 	<ul style="list-style-type: none"> ● Applications of AI technology <ul style="list-style-type: none"> ○ Technical descriptions of the AI technology ○ Use case of AI ○ Perceptions of AI ○ Strategy ○ Obstacles to roll out ● Actors involved in AI technology use <ul style="list-style-type: none"> ○ Users ○ Organisation structure ○ Development of technology ○ Cross organisation collaboration ● Implications of AI technology use <ul style="list-style-type: none"> ○ Effects of AI technology ○ Considerations for use ○ Regulation ● Key quotes 	<ul style="list-style-type: none"> ● Applications <ul style="list-style-type: none"> ○ Perception ○ Strategy: Introducing AI ○ Obstacles to Application ● Actors <ul style="list-style-type: none"> ○ Collaboration ○ Organisational Structures ○ Technical Development ● Implications <ul style="list-style-type: none"> ○ Consideration ○ Effect ○ Regulation

Fig 2. Comparison of coding schemes

This combined method of inductive and deductive coding allowed for greater flexibility, much like I attempted to embody in my interview methods, thus allowing more engaging interaction with the themes and concepts identified by my interview participants in relation to AI. The combined approach also enabled a greater degree of nuance in my findings as I adjusted closer focus on themes that emerged in the process of analysis, rather than

attempting to shape data to my previously determined code which in its earliest incarnations proved to have blind spots regarding some thematic areas. Following the initial coding of each individual interview, I comparatively examined the interviews to identify similar thematic trends and thought patterns in each code across the various interviews.

In order to visualise specific use cases participants mentioned through the course of their interview, I created an Excel spreadsheet which recorded the example mentioned and further details surrounding the technology and its use. A segment of this table can be seen in Fig.3, with the full excel sheet demonstrating use cases available in the appendix. This table allowed me to identify concrete examples of AI usage in news organisations, furthering an understanding of the actualities of AI usage. The table functions not only illustrate the range of AI technologies in use or development within media organisations, as well as identifying the most common types of AI in use, but provides a connection from this research to contemporary examples of use. While the table itself is not referenced extensively through the analysis, I have chosen to include the table in full in the appendix in order to identify to you, the reader, the range of technologies actually in use in news organisations, in addition to allowing an ability to further identify the cases or technologies I am referring to throughout my findings and analysis.

Example	Use	AI Technology	AI	Secondary AI (if applicable)	Organization	Speaker	Function - RESEARCH AND ADD OFFICIAL DEFINITIONS	Purpose(s)	Editorial or Operational	Challenges	Notes
Turkey Earthquakes	Scans footage submitted by civilian journalists post-earthquake and identifies resulting elements such as rubble, distinguishing from other events such as demolitions, and automates the archival and retrieval of footage	Computer Vision	Computer Vision		Al Jazeera	Grant Totten	Identifies and interprets elements of images and videos into data points such as location, what is happening in image etc (incorporates reverse image search)	Automation of archiving and access to content Confirms location of event Distinction between events Reduces fake news	Editorial	Financial	
Kashmir Protests	Journalist used footage of protests without checking location of video. AI would identify location of footage via background information and contexts	Computer Vision	Computer Vision		Al Jazeera	Grant Totten	Identifies and interprets elements of images and videos into data points such as location, what is happening in image etc (incorporates reverse image search)	Automation of archiving and access to content Confirms location of event Distinction between events Reduces fake news	Editorial	Financial	Could also distinguish between event on microscale such as riots at protests
Turkey Earthquakes	Scans footage submitted by civilian journalists post-earthquake and identifies elements that cannot be shown in news footage (ie, dead or injured bodies, blood etc)	Live Analysis	Computer Vision		Al Jazeera	Grant Totten	Identifies elements of content that cannot be shown in news and flags to operators before airing	Reduces harm to journalists and editorial staff Ensures audiences are not exposed to damaging content Allows content to meet legal and ethical regulations	Editorial		May be trained to a specific countries' priorities or ethical codes and thus not relevant to given countries editorial line
Shooting in South Africa	Scans footage of shooting and using indicative data points such as shots fired and location of footage to flag if an event such as a killing is about to occur	Predictive Analysis	Computer Vision		Al Jazeera	Grant Totten	Predicts events that cannot be shown in news and flags to operators before airing	Reduces harm to journalists and editorial staff Ensures audiences are not exposed to damaging content Allows content to meet legal and ethical regulations	Editorial		May be trained to a specific countries' priorities or ethical codes
Council Meeting Minutes	Listens to council meeting minutes and flags if content discussed is significant to a story, and predicts if events are about to occur that require coverage	Language Analysis	Speech Recognition	Machine Learning	BBC	Laura Ellis	Transcribes video or audio and analyses to identify points of interest or importance that can be flagged for stories, and cross-referencing with past stories to identify if event is of significance or not	Automates transcription Flags points of interest for stories Predicts and preempts newsworthy events	Editorial	Encoded bias	Could also be used for Office Care Policy Commission

Fig 3. Use Case Visualisation

Analysis

Applications

The applications stage of the AAI framework is a contemplation of the technology of AI itself, divided into three main subcategories. This first category is *perceptions* and explores how AI is defined, perceived and used, and how this may vary. The second subcategory, *strategy*, investigates the strategies and approaches employed by organisations in introducing AI into their ecosystems. Finally, the third section is of *obstacles* that function to delay or disrupt the deployment of AI. Despite sensationalist media coverage and catastrophizing social media posts, experts generally view AI in neutral to positive light, although some caution organisations and individuals in ignoring or procrastinating their confrontation of AI. A further frequent feature of perceptions of AI lies in comparisons against past examples of disruptive technologies, thus allowing contextualisation of the technology and its effects. Further, the adoption of AI requires not only robust digital strategy, but mental shifts within an organisation's core values, with the first step towards this being in education and an increase in AI literacy. Finally, the predominant obstacles faced across all news media organisations in the introduction of AI appear as cost; a lack of knowledge and experience; and attitudes of fear and distrust towards the technology, each of which serve to hinder the adoption and integration of AI. In considering the applications of AI we begin the construction of a foundational view of the practical actualities of AI use, from which we can begin to explore more abstract elements of AI analysis in the stages of actors and implications.

Perceptions

Much like communication itself, "AI is a concept without concrete definition" (Lewis, 2019:681). Perception and definitions of artificial intelligence vary across an individual basis, with the constant evolution of the technology itself seeming to inform a new understanding of the term on a near weekly basis. Within the context of news media organisations, AI seems largely defined through its proximity to human intelligence and its ability to do things that we simply can't or that we traditionally would need human intelligence to do (Laura, BBC; Mikaela, SVT). In many attempts to interpret the term there is a desire to land upon the broadest definition possible. However, such broadness in the context of these interviews does

not intentionally function to abstract and exclude understanding from the technology, but rather in order to attest to the comprehensive range of technologies and functions encapsulated under the term of AI (Dalia, Partnership on AI; Gillespie, 2014). We arrive at a suitably broad definition with Aimee's (AP) understanding of AI as "the reassembly of human ideas, intellect, and structures electronically," a definition that asserts AI not as a replacement to human intelligence and action, but rather a digital reorientation.

Similarly to its definition, attitudes towards AI also vary greatly. Those with extensive technological experience take the view that AI has in fact already been around for a number of years and it is only recently, with the public release of software such as ChatGPT that it has become a topic of note for the general public (Mikaela). Interviewees discuss the technology not as some hypothetical or proposed use case, but rather with a tone of both realism and inevitability:

"There's going to be tons of problems with it, there's no doubt about it. But we're moving in that direction. And so if we ignore it, and make it a joke, then the joke's going to be on us. We need to be prepared for this." - Aimee, AP

"There are large swathes that just don't see what's coming." - John, RTÉ

Such attestation to the disruptive potential of AI seems almost adjacent to that of a warning, not unlike Lewis' (2019b:267) prediction of future shocks, "the shattering stress and disorientation that we induce in individuals by subjecting them to too much change in too short a time," that could impact across both the news industry and broader society. As Aimee advises; "newsrooms, ignore it at your peril. Anywhere where words and images touch down, is going to be disrupted by this technology." Many of those currently working within news organisations have borne witness to decades of drastic change, with the introduction and rapid evolution of digital technologies such as the web and social media transforming their industry to be almost unrecognisable from the one they joined only several years prior. To many participants, having experienced two previous waves of digital disruption in journalism, those of the world-wide-web and social media, AI stands as the third wave.

Given the rapid rise of AI and its only recent appearance as a viable tool in the newsroom, there is a significant knowledge gap in play particularly among non-technical users like journalists. Dalia identifies that as little as eighteen months ago it was very unclear among local newsrooms what they could do with AI, beyond a vague understanding that it

could remove tedious tasks. However, the introduction of software such as ChatGPT appears to have illustrated the possibilities of generative AI and allowed individuals to experiment, resulting in an increase in both knowledge and interest among newsroom staff than was present even as little as six months ago. Newsrooms display an increasing willingness and readiness to learn about AI and responsible AI use, with a recognition of its increasingly ubiquitous nature. Discussion of AI is often received with a sense of excitement because of the possibilities and it promises, with a hope among many that AI will “enable us to do things quicker and in ways we couldn’t before” (Laura). However there remains a certain degree of scepticism towards the technical readiness of the technology, with issues apparent upon interacting with programs such as ChatGPT including hallucinations; where ChatGPT presents incorrect and imagined information as fact. Those who speak of the technical issues remaining with AI, John from RTÉ and Mikaela from SVT, work in roles more intimate to the actual technical operations of their organisations. This attests to Mikaela’s suggestion that while those new to and unfamiliar with AI are “amazed by how wonderful it is and how many things you can do,” people working on “the developer side” of AI and similar technologies remain critically aware of the limitations to the technology and other technical and ethical concerns, and attempt to dissuade from the adoption of attitudes of technochauvinism (Broussard, 2019).

A frequent fact of discussing new tech is its comparison against previous disruptive technologies, ranging from the internet and social media, to the printing press and telegraph. Aimee worked extensively on an earlier piece of disruptive digital technology during her time at the New York Times: the introduction of the worldwide web and the NYT’s online edition. She recalls attitudes of dismissal at the time, “of joking about it, saying it’s a fad, pushing it away, wishing it away... reacting to headlines and not trying to understand the technology,” attitudes which she also hears in connection with AI. Particularly on reflection to the introduction of the internet she finds it “incongruent that communicators would reject this device,” a sentiment she still feels in regards to AI. Across the interviews particular comparison is made to previous shifts in production processes within interviewees own professional lifetimes, whether the move from physicalized printing presses to the endless print run of digitised production and online publication or from reel-to-reel tape video and sound editing to digital files. However, for John (RTÉ), this seems the first time this shift feels as if to be on a scale equivalent to the industrial revolution. In making such comparisons, individuals contextualise the potential effect of AI against previous disruptive

technologies, in addition to recognising the transformative effects of methods of production upon news consumption and its socio-economic presence in our society.

Strategy: Introducing AI

Beginning the process of introducing AI requires an “understanding of what the potential is right across the organisation,” (Richard, RTÉ) rather than immediately narrowing in on a single editorial purpose. As Anderson et. al (2012:33) surmise, integrating AI into an organisation is not merely a matter of “bolting on a few new techniques,” but rather requires the development of extensive strategy and evolution around the technology. Introducing AI technology to media organisations is an iterative process requiring experimentation without a guarantee of success. Mikaela believes that this is a “way this sector is not used to working,” aligning with Paulussen’s (2016:194) proposal that a lack of tradition in experimenting hinders digital innovation within news organisations. As such, care has to be taken before implementation in making efforts to see where AI can add value, and ensure adoption is driven not by a baseless desire for the technology, but the ability of the business user to actually use said technology efficiently.

Beckett (2019:37) emphasises that the first step towards an effective application of AI at scale, beyond possessing the technical infrastructure required to implement and benefit from the technology itself, is developing a base of knowledge and skills around AI. AP has taken the plunge into expanding AI education, teaching to both knowledge deficits and knowledge interests through a six-unit course designed for participants across local news organisations linked to AP. Partnership on AI has also published materials detailing “some of the things these tools can definitely help with... and some of the ways that they might fail, and at some points fail catastrophically, and things that you could keep an eye out for when you’re putting these tools to use” (Dalia). Particular efforts are being made “not just to introduce the tools, or to introduce responsible AI separately, but to introduce the two together” (Dalia, Partnership on AI) and educate organisations and individuals on how to responsibly use AI. Such programs mark a shift towards improvements in AI literacy, but are only a fraction of the eventual effort that will be required.

Obstacles to Application

While media organisations are aware of AI and its potential benefits, with implementation of some technologies already on going, it is felt internally that organisations

have not yet experimented enough, partially as a result of resource and time constraints and the availability of personnel, but also as a result of attitudes towards the technology. While challenges to implementation can be “dependent on the different ways in which you’re using AI tools and how much you’re actually automating” (Dalia) the obstacles of cost, training and experience, and attitudes are felt across all news organisations. Expense is a restraint felt particularly by smaller local newsrooms who optimise for cost and are concerned “about adding more technology and another bill to their already wobbly tech stack” (Aimee). Grant (Al Jazeera) attests that the cost of processing credits “is more expensive than people are realising” leaving limited available financial resources to guide “decisions around procurement and use of AI tools in a way that larger or national news organisations might not be hindered by” (Dalia) and resulting in the acquisition of cheaper, more available tools over those actually the best fit for their newsroom.

A further obstacle to the use of AI by news organisations is the “the lack of experiments, lack of experience, the lack of skills and the lack of staff that know these topics” (Mikaela). In a field more closely associated with the social sciences and humanities, journalists are usually non-technical users with little-to-no AI, ML, or data science competence. This furthers a reliance upon third-party technology and software companies and their ability to “leverage control” (de-Lima-Santos and Ceron, 2022:17) with users desiring plug and play software with a user-friendly interface. However, that is not to say that there is no willingness to learn more about both the technology and responsible use, especially given that little coding or development experience is actually required for most users within news organisations, but rather a basic understanding of how things work and the ability to combine that with “our own systems and use cases” (Mikaela, SVT).

Two attitudes of particular restraint to AI deployment are of fear and distrust (Carlson, 2019; Linden, 2016). As Grant asserts, the “biggest challenge is the scariness of the word AI. Traditional journalists in a traditional newsroom are always going to fear for their jobs.” Aimee echoes this sentiment, with a belief that among the general public “AI is not welcomed necessarily. I think people are worried. People just read the headline and don’t understand the technology, and some of the headlines are ‘you’re going to lose your job soon.’” These fears speak to broader division around technology at large, with some enthusiastic and others far more conservative or scared by the introduction of new and unfamiliar tech. There is a particular recognition of the mental shift required to accommodate AI, particularly in understanding differences from past technologies. Unlike other more mature technologies that we are familiar with, AI requires continuous monitoring and for

users to consider further customizations, a major shift in understanding which in itself is a challenge, especially in the fast-paced environment of a newsroom already strapped for resources. Such attitudes permeate at a managerial level at many organisations, with a reluctance to invest the resources, staff, and time in order to facilitate an efficient shift to AI. As Mikalea summarises, organisations “need to change how they’re doing things, and that takes time” (SVT). To return to our earlier contemplation of the term, the broadness of AI is itself a hindrance, appearing as a loaded buzzword that, while great for splashing across marketing campaigns, strikes fear into the hearts of many journalists (Grant). As such, Grant proposes a reinterpretation of the acronym AI: “automating intelligently.” This interpretation attempts to reposition AI away from abstract understandings towards the actual use of AI ongoing in many news organisations—a tool of automation applied thoughtfully and sparingly. While the applications of AI are varying in perceptions, strategy, and possible obstacles, it lies in the hands of *actors* to complete this thoughtful and sparing application, reckoning with a range of organisational and institutional factors that seek to impact the process of AI adoption.

Actors

In addition to the attitudes and capabilities of individual staff and journalists, the successful adoption of AI necessitates institutional and organisational change. Therefore, it is crucial to examine the organisations themselves as key actors in the process of AI adoption and integration. The subcategories of analysis at this stage begins with the consideration of *cross-organisational collaboration*. The second stage moves to analyse the *organisational structures* of newsgroups themselves, while the third and final stage considers responsibility for the *technical development* of AI. Cross-organisational collaboration is a feature of AI development, transcending the traditional borders of market competition and implying that the advancement of AI will benefit not only individual organisations, but the industry as a whole. A further component in considering organisational AI adoption is the institutional structures of the organisation, whether that be in terms of their ownership and existence as either a public or private broadcaster, or their scale as either a local or larger scale organisation. Both of these elements persist in governing not only how and why AI is adopted, but in the considerations that must be made in thinking about AI. Technical development is the final element of consideration, with tools either a result of third-party providers or in-house development, each of which provide separate benefits and

disadvantages. In analysing the role of organisations as actors in the adoption of AI we begin in constructing a further dimension of analysis through which to consider the role of AI in news media organisations.

Collaboration

A fact of AI innovation is cross-organisational collaboration, transcending the barriers usually enforced as a result of oversaturated market-competition. Collaboration is facilitated both across multi-organisation groups such as IBC, the International Broadcasting Convention, and Partnership on AI; independently between organisations, such as Al Jazeera's various collaborations with BBC, AP, and Reuters; and even with tech companies including Microsoft and Google. Throughout the interviews organisations were also particularly complementary of each other's work, identifying projects and teams that they admire from across the industry. Such collaboration emphasises the image of AI as not only an advantageous technology to whichever individual organisation can successfully integrate it, but a technology promising cross-industry innovation and disruption. There are particular efforts being made to "bring everyone around the table: local news organisations, established news organisations on a national level, academics, tech companies, social media platforms, civil society" (Dalia, Partnership on AI) in order to shape guidance on responsible AI use, demonstrating a desire for democratically driven regulation that evokes collaboration transcending organisation boundaries in its creation.

Organisational Structure

Particular emphasis in terms of organisational structure is made in the distinction between public service broadcasters and those privately owned. Of the organisations who participated in interviews three, the BBC, SVT and RTÉ, are public broadcasters with the majority of their funding coming from licence fees and the state. Laura suggests that particularly among organisations that require commercialisation and substantial profit margins it may be harder to balance ethical policies and views of the world with ensuring that AI technologies work in favour of their business aims. While public broadcasters may not experience this specific issue, there must be a priority made in bringing value to licence fee payers and ensuring that limited resources are not extravagantly spent or wasted. Mikaela identifies a challenge felt in Sweden, but shared across many countries with public broadcasters, with some members of the population believing that public funds are

misappropriated into broadcasters, thus seizing the organisations as political pawns in debate. As such, given the desire of some parties to reduce the capacity of organisations like SVT, Mikaela feels that they cannot “afford to make serious mistakes” when experimenting with AI and digital solutions, in fear of adding “fuel to the fire.”

In the integration of AI there are certain duties specifically felt by public broadcasters. Among these, Laura (BBC) notes, is the provision of beneficial public services such as ensuring audiences are not “sticking around forever... frying their eyes” and facilitating comment sections and community spaces that do not deteriorate into a veritable bloodbath. Perhaps the most important element of public sentiment for public broadcasters to facilitate is that of trust. As Mikaela defines:

“As a public service SVT is the most trusted media organisation in Sweden, and that’s something to value and to cherish and to take care of, we can’t risk that. One of the most important assets we have is the trust of the Swedish people. Otherwise there is no real reason for our existence anymore.” - SVT

As such, in introducing AI, efforts have to be made in retaining national broadcaster’s reputations as both highly trusted and regarded organisations by encouraging responsible AI use and management and leading by example. John particularly feels that “as a semi-state organisation, there is an ethical responsibility on us to ease our staff through this transformation,” ensuring that ethical behaviours extend to treatment of staff. While public broadcasters like RTÉ desire the efficient use of AI tools, they feel that a large-scale displacement of people is not what a public service broadcaster should stand for. While private companies may be profit driven and fire employees en masse, public broadcasters feel that they should advocate for their employees and make efforts to ease them through the transition to AI.

Beyond distinction between organisation ownership and funding, particular exploration was also made in interviews in the experience of *local* news organisations. Both Aimee and Dalia work extensively in introducing AI tools and responsible AI use to local level newsrooms, motivated by a belief that:

“If local newsrooms understood the tools that were available to them, they would be better equipped to kind of adopt some of these tools responsibly, but also to be able to free some of their journalists to just do journalism, and if we were able to promote

and support the responsible use of AI in local news, we would be able to help sustain an industry that was very quickly declining.” - Dalia, Partnership on AI

Local newsrooms particularly struggle under the weight of content like police blotter items, community calendar items, school lunch menus, road closures, and city-council meetings. While such coverage is unlikely to win the next Pulitzer, it is intrinsic to the survival of small-town communities and networks. Additional technical resources such as AI could allow journalists “to do journalism, and not to do journalism and 15 other things because they’re strapped for resources,” (Dalia) alleviating the grunt-work of small-scale newsrooms. Introducing AI technologies to these newsrooms also offers an opportunity to preserve the value of local newsrooms, an industry increasingly undergoing decline and amalgamation into larger corporate entities. Aimee speaks specifically to the value of local newsrooms and journalists resulting from their familiarity with their communities:

“Let’s take a mass shooting as an example. It’s those local reporters who know who the principal is at that school. Maybe their own kids go to that school, or maybe they’re friends with the parents because they live in the same neighbourhood. We saw that in Uvalde, the journalists who live there, who were closest to it, were able to tell known stories and familiar stories.... Somebody in Uvalde is probably subscribing to the local paper, but not the New York Times. They may never see the New York Times report on this. They are relying on these papers and broadcasters to deliver information on how to live in *their* community.” - Aimee, AP

Although, as aforementioned, cost can act as a particular obstacle for small scale newsrooms, their scale also affords some benefits in regards to AI adoption. While larger organisations may find it hard to move as fast and as freely in adoption and adaption, smaller scale organisations have better opportunity to conduct their own experiments as opposed to entirely adopting a tool as a larger scale organisation might.

Technical Development

Many news organisations have already been using AI tools and automation in some capacity for several years, and have even embarked upon the development of their own custom technologies. Particularly in larger, well-resourced newsrooms we are beginning to

see the creation of tools in house, allowing them to be “highly customizable to their needs” and compensating for software that isn’t necessarily “already being created out there” (Dalia). This speaks to the fact that many AI technologies have not been purposely designed for the news media and journalism industry, but rather co-opted from other fields (Hansen et. al:2017), thus reducing their applicability to the demands of the newsroom. Al Jazeera is one organisation investing extensively into in-house development, with the belief that “bringing it closer to home allows you to hone it and get ahead of the competition” (Grant). SVT have also found themselves developing platforms like their recommendation engine and digital player SVTplay in-house, while newer projects on a proof of concept or experimental level rely upon open-source libraries to provide foundations for development. In-house development can enable organisations to gain control over selected training data and thus reduce potential levels of bias or irrelevance to the organisation that may be expressed by the technology when reliant upon the whims of third-party providers (Hansen, 2019).

Some organisations, especially those at a small or local newsroom level, are both reluctant and unable to pay a “recurring charge of \$100 monthly to third party operators” (Aimee, AP). There are also concerns regarding the access of third party groups to organisation’s data and information, particularly as it relates to audience and viewer data. Some organisations are uncomfortable having their data harvested to be used as training data for AI platforms that will later be further disseminated across the industry, particularly if an opportunity may later arise for the organisation to monetize that data themselves. However Grant sees this ability as a quasi-bargaining chip, with the ability to waive or reduce the costs of using a platform by offering training data in return, granted with the correct privacy concerns and consent accounted for. Interaction with vendors acts as another opportunity for collaboration, as the AI techniques will “ultimately get worked back into the vendor ecosystem,” (Grant) and so both the partners and vendors can seek to benefit from its enrichment. Particularly in negotiating relationships with third-party operators and vendors organisations should be sceptical of the promises made on marketing web pages and the digital equivalent of snake-oil salesmen, as while vendors may sell a “tool as being able to do sixteen different things, in reality they have one core offering that they’re really good at, and fifteen over things that they do on the side that are maybe mediocresly well done” (Dalia). Such caution is particularly important for organisations with limited resources and thus limited investment ability, as while versatile technology is important, efforts must be made in ensuring that the software of choice actually meets their needs. Beyond accommodating for their own organisational needs, thought in technology acquisition must also be given to the

implications of the technology, both the considerations and potential effects of its use, and in how to regulate to ensure responsible AI use.

Implications

The final stage of the AAI framework comes with the analysis of the implications of AI usage for not only the news industry and its employees, but at a broader societal level. Here we recognize the considerations that must be made in the development and deployment of AI; the potential effects of its use on an individual, organisational, industrial, and social scale; and look to developing regulation for ensuring the responsible use of AI. Among the considerations that should be made in the use of AI are those surrounding labour; continued human intervention; ethical and moral considerations such as encoded bias and data usage; non-English language contexts, fake news and trust; and the perpetuation of harmful behaviours. Despite these, AI promises a number of positive effects and changes affecting not only labour, but impacting upon journalistic norms and practices such as data processing and analysis, speed and scale, and the enrichment of creativity and content; alongside the psychological and emotional effects of AI and its potential to improve accessibility. Perhaps most important in considering the development and deployment of AI is contemplating regulation of the technology, its production, and the key responsibilities that should be encapsulated within, such as protecting audiences; reducing bias; encouraging transparency and accountability; and preserving trust. Exploring the implications of AI encourages broader and more abstract thought on AI, allowing us to finalise our holistic view of the technology and its intersection with the news media industry.

Considerations

For those excited by the potential of AI there can be a reluctance to recognize that beyond the wealth of possibilities that stem from the technology, there can also be a dark side. Currently, given the iterative nature of AI, “nobody’s quite come to a conclusion as to how useful it is, and people are very worried about algorithms disadvantage us” (Laura, BBC). Technologies such as AI have “wide-reaching and persistent consequences,” (Bucher, 2018:167) and as such it is critical to identify the considerations that must be taken into account when developing and deploying AI technologies. Regardless of AI, the media and

news industry innately have high ethical responsibilities and this should be reflected in attitudes towards any and all aspects of change, evolution, and innovation across the industry.

Perhaps the biggest consideration to be made in introducing AI within a professional organisation is in connection with labour. To return to Grant's (Al Jazeera) assertion: "traditional journalists in a traditional newsroom are always going to fear for their jobs." Organisations remain aware of the potential reaction towards AI introduction that some employees may have. In the case of RTÉ there is an intention to introduce AI in digitising their archive, a library consisting of 500,000 hours of audio and about 250,000 hours of video dating back from the 1930s and earlier, utilising computer vision and speech recognition techniques. However, introducing such automation can be a difficult line to walk, given that the archivists themselves would rather employ hundreds of additional archivists to perform this work than assign it to an AI system, despite the limitations on hiring felt by the company itself. However, John feels that "replacing all archivists with a machine tool would be the wrong track" for RTÉ and that a preservation of employment takes precedence over the complete automation of all roles.

While AI does offer an opportunity for smaller newsrooms to compensate for limited resources and capabilities, that is not to say that the technology can run unsupervised in place of human labour. Rather, AI still requires a degree of human supervision and intervention. Dalia identifies that the degree of automation is often overestimated, with a false assumption that AI can "do a lot more than what it can... without human intervention or tweaking to read the results that we want it to." Particularly in the case of generative AI, such as popular image generation software Dali, there especially remains a need to write the perfect prompt in order to elicit the exact desired result from the software. While AI could offer a lifeline to local newsrooms, this need for supervision is, in itself, an obstacle given that newsrooms with already limited staffing pools may struggle in freeing employees to be "the steward of these tools" (Dalia, Partnership on AI).

Further considerations to be made in the use of AI veer into the field of ethical and moral consideration. Encoded bias is a phenomenon often discussed in connection with AI tools, with the bias, views, and opinions of developers encoded, whether intentionally or not, into their work (Gillespie, 2014; Noble, 2018; Broussard, 2019). Grant identifies that a particular reluctance in using AI in the Middle East extends from a fear that "English models are trained in a biased way that may pull out things less relevant to what their editorial line cares about." As such, encoded bias poses not only ethical questions in the potential biases or discriminations a software may perpetuate, but also in inadvertently detracting from the

professional functions or editorial aims of an organisation. Beyond the potential bias of the model, ethical questions also extend to how developers source their data. An innate fact of AI and deep learning models is that they require huge amounts of data with the majority “either taken from various innocent people on the internet who did not agree for their data to be used for that, or you’re paying people really badly to do a really boring job somewhere” (Mikaela). As Hansen et. al. (2017:2) state, the “ethical use and disclosure of data is a fundamental issue that journalists need to confront” when interacting with these technologies. What is being done with data taken from audiences is a vastly important ethical consideration for organisations leveraging AI, with the conversation around data and user data not nearly as advanced as it should be and requiring far greater efforts to be made in educating audiences on their data rights.

Particular considerations have to also be made around the use of AI in non-English language contexts. With generative AI models trained from English language input and triggered for use by textual prompts and commands it seems, as a viral tweet following the public release of ChatGPT declares, that “the hottest new programming language is English,” (@Karpathy, 2023). As aforementioned, reluctance in international contexts to use English language models and fears that they may contain bias results from the fact that English NLP models are often more advanced than those trained in other languages (Grant). English models often provide a greater degree of granularity in terms of elements such as places, names, or politicians included in training for software, giving them an innate advantage over non-English language models. In the case of Swedish, Mikaela attests that software such as speech-to-text has improved significantly over the last several years due to a wealth of Swedish available on the internet to train from. However there still remains a limit on the granularity of models, with those available largely “trained on roughly the same data set, with people, locations, and organisations... otherwise you have to train it yourself” (Mikaela). Further, while Swedish speech-to-text models may be improving, they still struggle with non-standardized Swedish accents, whether those from the region of Skåne or people who are not native Swedish speakers. RTÉ has experienced similar issues with the Irish language due to a plethora of regional dialects, particularly in archived material recording dialects that have since faded from existence.

A frequent topic of consideration associated independently with both AI and news media is that of fake news. Fake news and disinformation have plagued the news industry for several years, but with AI tools able to generate fake context at unimaginable scale it seems it will only increase in precedence. As John states, “we’re moving into a world where twenty

years from now any image or sound recording could be entirely fake. What does that mean for journalism?” With the threat of disinformation increasing ten-fold, journalists must be more critical about their sources and hold awareness “that things are not true just because they look true” (Mikaela). John also voices a role of responsibility for news organisations in fighting disinformation, with all providers of information possessing an obligation to educate audiences and users in becoming aware of their own false content consumption and critically engaging with information that they encounter.

A final consideration to be made in the introduction of AI technologies is the potential for their effect in perpetuating harmful behaviours. Laura (BBC) particularly identifies this in relation to automated recommender algorithms, used not only to promote content of interest to readers but actually tailor content to their tastes. She believes organisations have a responsibility to drive development that “takes the addiction out of it and puts in responsible business rules” in order to avoid sending people down rabbit holes and developing an addiction to consuming content. In order to demonstrate the potential perpetuation of harm such tools could perform, Laura gives an example of an individual accessing an article about suicide, with the fear that an uncontrolled recommender algorithm could then further feed similar content to a vulnerable user and compound harmful thoughts or behaviour. In the prevention of this and similar occurrences, organisations hold a responsibility in the training of tools, and must remain mindful of potential negative cumulative effects that software can have upon individual’s mental health and behaviours.

Effects

Beyond the considerations that need to be made in introducing AI, there are a number of transformative effects the technology can have across individual, organisational, industrial, and social levels. As recognised previously, a common fear of AI is its capacity to replace people's jobs, passions, and livelihoods. However, Dalia offers an alternative view to this position:

“The inevitable question is: do you see (AI) replacing journalists? Personally, I do not. I think journalists have a very unique vantage point on society and on what people want to read and what they're interested in. They're often responsible for being the voice of nuance and a lot of conversations, and that is very uniquely something

that only a person with their pulse on what people care about could do.” - Dalia,
Partnership on AI

Uses of AI in smaller scale organisations can function to compensate for a lack of staffing and availability, acting even as a copy editor for newsrooms without one, and enabling reporters to receive feedback on their work. Aimee attests to a belief that:

“Local newsrooms are going to see an enormous boost with what they're able to accomplish on a daily basis. Their staffs have shrunk, their coverage area has widened because of so many newsroom closures, and I think they've been swimming in too much information. I think the only way to grapple with that is to use generative technologies to hopefully fill in some of that gap.” - Aimee, AP

AI promises particular effect upon journalistic practices and norms otherwise ingrained into the daily operation of news media organisations. New technologies have always had an effect upon the practices and routines of news organisations. Returning to Örnebring’s (2010) example of publication schedules shaped by train times, AI promises similar potential in reshaping journalistic labour and practices. Given that organisations such as AP produce as many as 2000 articles and 3000 photos a day, the scale to which technologies such as computer vision and NLP could drive change is almost unimaginable. A particular view on the effect of AI upon journalistic practices is of its ability to act as a support tool. Grant dissuades catastrophization around the technology, stating that while generative models can summarise articles or pieces of work, the journalist still has the ability to edit with the predominant action of the technology being to pull together information. Following the writing of an article NLP technologies like ChatGPT could be used in “summarising it or creating a TLDR (Too Long Didn’t Read) summary. You could ask it to do a Twitter thread or Facebook post. You could ask it to do A/B headline testing. You could turn an article into a broadcast script, or turn a broadcast script into an article” (Aimee).

AI tools have particular promise for data-heavy stories and topics, whether that be high-school sports scores or investigative journalism into financial scandals. Laura believes that AI will “give us superpowers when it comes to data,” particularly in processing large datasets and coding “new ways of looking at data that are currently inaccessible because we simply don’t have the cognitive power that machine learning does.” With tools allowing journalists to analyse and search data and files at scale, AI can assist in allowing journalists to

focus on more valuable aspects of their personal creative processes. While it is humans who will provide the higher value work through editing, refining, and extending upon output, AI allows us to augment pre-existing processes and innovate new ones.

Given the shift in emphasis of newsroom culture across the last decade to the value of immediacy (Usher, 2014) a further effect in terms of change to journalistic practices on norms is in speed and scale, with AI holding potential to speed article production and publication up and cut down time spent on administrative duties and rote tasks. An efficient leveraging of AI tools can reshape journalistic workflow patterns (Hansen, 2019) and “make journalistic processes more inspired and quicker,” (Laura) thus enabling organisations to be “more efficient and effective, and to realise new opportunities” (John). AI tools can also act as a safety net for the particularly human flaw of mistake making. As Grant distinguishes, using AI in preventing issues such as misinformation is not necessarily solely in fighting fake news, but is also about “us and our journalists accidentally making mistakes,” enabling easier processes of fact checking and information confirmation.

AI’s potential effect upon enriching creativity and content generation is also of note. While a broader debate rages on “whether generative AI is going to make us less or more creative,” Laura believes AI could grant a further creative boost to the news media industry. While adverse to seeing AI entirely generate stories for consumption, she would be open to a use of AI in instances such as generating imaginative introductions that journalists then use their skills to build upon. While tools such as recommender algorithms alone offer an opportunity to “give people a much richer experience from the abundance of content that you have,” (Laura) an integration with synthetic media and content generation will allow organisations “to be more inclusive, allow us to be more universal, and allow us to offer people different alternatives.” Laura’s particular example of this use of AI arises with a project currently underway by the BBC to integrate Deep Fake and image generation technology into on-demand weather and news content, allowing users to synthesise a synthetic human, or presenter from elsewhere in the BBC, even engaging in encouraging diversity with the idea that users who may otherwise feel underrepresented can select a presenter that they feel closest aligns with their own identity. However, Laura does caution against misuse of the technology, something that must be taken into consideration in development, as if someone with far-right racist views was to leverage the deep fake to intentionally exclude people of colour, the technology “suddenly starts to feel really dystopian.”

AI technologies offer further potential in terms of their psychological and emotional effect. Grant summons a particular example of using computer vision technologies in analysing things journalists do not want to and should not be repeatedly exposed to, whether that be violent images, nudity, or death. A particularly exciting use-case comes with the integration of computer vision with predictive technologies. In training AI technologies to recognize the data points—combining visual, audio, and locational information—that can occur prior to an event such as death that cannot be shown on live television, the software can “analyse the images coming through the stream in real time, and flag it to the operators before they put it on air” (Grant) allowing producers to cut away before a traumatic event.

A final potential effect of AI in news organisations is in encouraging accessibility. While as much as 90-95% of organisations like RTÉ’s content is subtitled, only 9-10% is signed, with audio description at a similar level (Richard). While organisations likely cannot hire the number of people required to sign this volume of content, AI technologies such as image and speech analysis, or even synthetic image generation for signing, can enable the automation of these processes and meet increasing requirements on percentages of subtitled and accessible content. As such, the introduction of AI enables organisations to provide increased value to diverse audiences, “without increasing headcount or cost” (John). As Laura states, “done properly, this could really help people.”

Regulation

One of the most important elements when thinking about AI integration, whether on an individual, organisational, or societal level, is in regulation. In designing this said regulation, news media organisations have an opportunity to imbed their own organisational, institutional, and professional values in order to shape the use of AI technologies in driving news production forwards (Diakopoulos, 2019). Mikaela (SVT) makes reference to Japanese organising guru Marie Kondo when thinking about regulation, asserting that much like you “should only keep the things that spark joy... you should not *automate* the things that spark joy.” A particular motivation in creating and driving regulation extends from a need to protect audiences. As Hansen et. al (2017:2) state “while the intersection of AI and data offers new kinds of opportunities for reader engagement, monetization, and news feed personalization, with this comes the challenge of finding a balance between creating echo chambers and remaining committed to journalism’s public service mission.” Laura’s mission in negotiating this balance includes questioning “what media and consumption habits are you driving

through (AI) and if they are healthy” and looking at how you can “guard against unintended consequences” through the implementation and observation of responsible business practices in the development and deployment of AI tools.

A predominant concern for many media organisations in designing AI regulation is to ensure a reduction in bias and the maintenance of some semblance of neutrality in coverage. Especially for organisations on the scale of the BBC, Al Jazeera, and AP there must be a focus in reducing the bias of both content and tools. As such, efforts in training AI must be made to “abstract from opinion and ensuring that you train sufficiently on a political spectrum from right to left” (Grant, Al Jazeera). A further facet of AI regulation pertains to the data rights of both organisations and their audiences. As part of a wider conversation on digital data rights, regulation must ensure that user data is protected, and emphasis must be lent in ensuring that users not only give explicit consent for their data to be collected, but are given agency and accessible understanding of exactly what their data is being used for and by whom. Regulation also has a responsibility in protecting labour rights. Given that AI has potential to provoke a disruption to labour “no different to the industrial revolution or anything else where potentially people were displaced by mechanical tools” (John) organisations have an “ethical responsibility to ease staff through this transformation.” Efforts to prevent a mass displacement of human labour, and the resulting economic and social repercussions of such an action, should be enshrined into regulatory guidelines. To return to Mikalea’s (SVT) proposal, much as we “should not automate the things that spark joy” we should also not automate the things that provide individuals with purpose and passion.

Perhaps one of the key steps towards actually creating regulation comes in ensuring that “we think really long and hard about what we do and we keep an ethical filter uppermost in our minds” (Laura, BBC). Establishing regulation requires careful thought and consideration on how artificial intelligence can be handled from a policy perspective. While many organisations are yet to finalise their AI strategy and ethical guidelines, informed decisions and extensive consideration of the implications of AI technologies must be made in the meantime, particularly in designing routines for evaluating technologies prior to implementation to ensure they are both the right tool for the organisation and purpose, and in ensuring the ethical composition of the technology itself.

A key piece of regulation is ensuring transparency around when and how AI is used in order to dissuade from the application of the black-box (Hansen et. al, 2017; Diakopoulos, 2015) to overall aspects of AI. As Gillespie (2014) distinguishes, insight into the use and workings of algorithms in itself acts as a form of power. In ensuring fair use of this power

Aimee (AP) states that it is “incumbent upon the publication to be transparent” about when a story or information is generated by a program. For example, since 2014 AP has automated business earnings reports, allowing them to go from doing 300 earnings reports to 3000 earnings reports on an annual basis without human interference, however care is always taken to say at the end of each report to distinguish the use of AI in its generation. Dalia distinguishes that establishing responsible AI use regulation is “not necessarily reinventing the wheel,” but rather drawing on preexisting ethical practices and perspectives in order to contextually “mitigate some of the harms in which AI is being used.” Beyond changes at an organisational level, responsibility also should be placed on politicians and legislation in introducing regulation on both AI and the technology companies producing AI software to ensure that responsible AI is not just the property of news organisations, but an industry wide phenomenon.

Regulation of AI is needed for a number of reasons, but among the most eminent for organisations is the protection of the organisation’s reputation itself. This particularly applies in protecting the public’s trust in news organisations. While integrating AI, organisations need to ensure they protect years of experience and heritage with the use of AI to “discover the truth more important than using AI to just make up news” (John). The responsibility of news organisations in “this heightened era” to be “a trusted news source is now higher” (Ibid.). Better conversations must also be held regarding both media and AI literacy, in order to give people an improved awareness and understanding of what they’re doing in terms of AI usage. The importance of careful, responsible AI use in the protection of the most important parts of journalism is summarised in my discussion with John and Richard, the RTÉ interview participants. As they profoundly attest to the importance of journalism in the age of AI:

Richard: “I think it is going to mean that people are going to seek out more trusted news sources.

John: “Yes. **I don’t think journalism matters more than now.**”

Richard: “I really do believe that.”

Conclusion

What is the current landscape of AI in news media organisations in terms of its applications, actors, and implications?

Mapping the landscape of AI through the AAI framework engages a holistic examination of the technology, its use, and effect, while also allowing us to hold individual facets and aspects to the light. The applications stage demonstrates that the twenty-three use cases of AI technologies identified through the course of interviews represent only a fraction of the diverse AI technologies currently being used or developed in news organisations globally. Due to the variation of both AI technologies and understandings of the term, it serves to adhere to a broad definition when speaking generally. Further, the definitions and understandings of AI particularly in the news media arena, will continue to change and evolve with the release of new and increasingly impressive models. Engagement with how we define AI is particularly important as a step in how we define our interactions with the technology, and so continued engagement, interaction, and challenging of our understandings and perceptions of AI should be encouraged both within academia and our professional and personal encounters with the technology.

Beyond theoretical understanding of AI, the actual application of its technologies requires the development and deployment of robust and clear digital strategy, considering not only the technical architecture required, but allowing for educational opportunities and professional development for all staff and stakeholders implicated in its use. Part of constructing this strategy results from a willingness to challenge and shift the pre-existing values held within organisations, which in itself presents as an opportunity to reorient and redesign the industry and organisations that make it up as we know them. The final aspect of the applications of AI technology for consideration are the obstacles that stand in the way of its adoption and application. The obstacles of cost, lack of knowledge, and attitudes of fear and distrust are felt across all organisations in relation to AI. The latter two of these obstacles can be solved again with increased education and AI literacy, which allows people to familiarise themselves with the actualities of the technology and how it can be applied in their everyday routines and workflows. While cost is a harder obstacle to overcome for many organisations, continued investment and innovation from larger actors will hopefully make

AI technologies increasingly available, with alternate options like the adoption of open-source codes acting as a more accessible option for many.

When examining the adoption of AI from an organisational perspective, a key piece for examination is in considering the organisations as actors themselves and how this guides and influences the adoption and integration of AI. Cross-organisational collaboration appears a fundamental piece in the development of AI technologies. Even as AI integration becomes increasingly marketized and mainstream, with those at a managerial level paying increased attention to the technology and its potential, efforts should be made to continue to foster collaborative efforts that prioritise the advancement of the technology and industry at large, rather than inciting a new age space-race between organisations. In regards to the effects of organisational structures on AI adoption, factors such as the public or private nature of an organisation, or its existence at a local or national level can function to shape decisions and direction. For instance, public broadcasters feel less ability in experimenting, but a greater responsibility to provide both employees and audiences with both value add and a duty of care. Meanwhile, while the introduction of AI technologies can preserve the value of local newsrooms and enable them to do more with less, they may find it harder to adopt AI as a result of resource, staffing, and cost limitations. The final piece to consider at the actors stage surrounds technical development. While not currently possible for all organisations, attempts should be made to invest in and expand in-house development in order to develop custom use tools for the industry and ensure that third party providers and ‘big tech’ are not able to assert and abuse power over news organisations and audiences and their data.

The final stage of consideration is in the implications of the use of AI, across not only an organisation, but the industry and profession of journalism and news media, and broader society. The considerations that must be made when developing and deploying AI are wide ranging and require engaging not only with practical considerations but wider societal responsibilities. Such considerations are particularly important to consider when driving regulatory efforts and building strategy, with a need to critically engage with the technology beyond its initial surface shine. Despite this, AI retains potential in changing the face of the media industry as we know it, entirely altering the roles and routines more traditionally associated with journalistic and editorial work. If used correctly and responsibly AI could drive positive change, especially in relation to accessibility and social impact. The number of considerations and effects put forward throughout interviews remained at a consistent rate to each other throughout the coding process. This even distribution is a demonstration of the

symbiosis between the considerations and effects of AI, and while refraining from value assignment; for every bad a good. Across the news media industry and beyond, efforts still remain to be made in determining the regulation of AI. We should encourage regulation that is ethically driven and socially responsible, and strive to embed good business practices across all organisational levels in the development and deployment of AI technology. Responsible AI regulation requires not only collaboration and open minds, but a willingness to challenge preconceived notions of the industry, alongside a desire to see change for the better.

To what extent is the AAI framework applicable and efficient in the analysis of AI technology in news media organisations, and what are its strengths and weaknesses?

The AAI framework, developed for the purposes of this work but intended for future use on the analysis of new and emerging digital and AI technologies in the news media industry, has served as an applicable and efficient method of analysis throughout the course of this paper. The framework provides a comprehensive approach to analysing the adoption and integration of AI in news media organisations, accounting for the varying dimensions of AI use and its impact. Among the virtues of the framework is its flexibility, allowing the application of the model against a variety of organisational contexts and enabling nuanced yet comparable understandings of AI's application in varied settings. In design of the framework I strove to enable a holistic analysis of AI, recognising the complex interplay between the technical, social, cultural, and institutional factors that shape organisational practices and decisions in relation to tech acquisition and integration. Above all else this framework is intended as actionable, with its findings not only of academic value but in its ability to provide insights into specific strategies and practices from which organisations can draw value in order facilitate responsible and efficient AI use. As this thesis has proved, one of the key steps towards integrating and embracing AI is from driving change in the attitudes and approaches traditionally enshrined in the news industry. Such an approach also applies in the academic study of this field, with the novelty of AI and its effects requiring equally innovative approaches and methodologies for study, hence the construction of this framework.

Despite the value of the framework, as with any early academic concepts it would benefit from further adaptation and development, especially as result of its creation within the limited time frame of a masters thesis. A key point in leveraging this framework for further use is that it must remain flexible and be continuously updated and refined in response to new development and emerging technologies and challenges in the field of AI and news media, as well as acknowledging the continuously changing regulatory landscape surrounding AI. Efforts should also be taken to address the potential biases and blind spots of the framework, such as its tendency in the actors stage to focus on technical aspects of AI adoption at the expense of considering social, cultural, and institutional factors that shape organisational practices. Another way in which the framework could be enriched would be in further identifying a more-nuanced and context-sensitive understanding of the relationships between the stages of applications, actors, and implications, and how these can vary across different organisational and institutional contexts, especially in application against organisations from outside the non-traditional media space.

What steps can organisations take to facilitate the responsible and efficient adoption and integration of AI?

Early in the process of writing this thesis I knew I not only desired to make my findings applicable within academic contexts, but also prove of use to media organisations in their processes of adopting and integrating AI. I was fortunate in the final days of this work to attend the first inaugural Nordic AI in Media Summit in Copenhagen, and there converse with practitioners of news, media, and communication from the Nordic regions and beyond. In these discussions I summarised my months of research into seven actionable steps that organisations can take in ensuring the efficient and responsible adoption of AI, drawing from my findings and the AAI model.

- 1. View AI as a tool:** Adopt a nuanced perspective towards AI in recognizing it as a resource for augmenting human capabilities, rather than a replacement.
- 2. Avoid catastrophization (in all directions!):** AI is neither a death knell nor a saving grace. Recognize both the benefits and risks associated with AI, and adopt a balanced approach towards implementation by evaluating technologies based on evidence and data rather than speculation or fear.

3. **Establish clear and effective strategy:** Think forwards and develop clear and effective strategies for AI adoption and integration that align with organisational objectives and values.
4. **Invest wisely:** Make researched, informed decisions and ensure that the technology works to your needs, rather than the inverse.
5. **Engage critically:** Engage in critical evaluation of AI by questioning assumptions, challenging biases, and analysing evidence.
6. **Encourage collaboration:** Foster and facilitate collaboration with internal teams, external partners, regulatory bodies, and technical providers.
7. **Democratise conversation:** Promote democratic approaches to AI, ensuring that diverse perspectives are heard and engaged in ongoing dialogue.

Looking Forward

An unfortunate fact of the ever changing nature of AI is that, within weeks of completion, a thesis on the topic runs the risk of being rendered obsolete. In accounting for this, I have attempted to provide transferable insights and a flexible framework throughout the course of my work, but alas, the risk remains. As such, we must also look to how this research can seek to continue, even among the shifting landscape of AI. An immediate interest lies in transferring the AAI framework and focus of analysis from the level of the organisation to that of the individual; both in regards to individual journalists' attitudes and experiences of AI integration, and also in the analysis of individual AI technologies in use in newsrooms, such as Natural Language Processing or Recommender Algorithms. Such research would allow insight into the actual occurrence of AI integration, beyond wonderings at an organisational level to the actual willingness and desire of journalists to adopt AI into their own workflows. Application against individual technologies meanwhile, would allow for the analysis and evaluation of the technologies purpose, and enable broader contexts surrounding its development and use. While the AAI framework was developed with news media contexts in mind, it would also be of interest to see if its format could be applied in analysing the introduction of AI in other fields of media, and even outside of the subject. Ultimately, the future of AI is both unpredictable and unknowable, and as such the academic study of it demands flexibility and acceptance of radical change at unexpected paces. Given that this field is only in its comparative infancy, I am excited and intrigued to see the next

steps taken, and encourage researchers to go forth, if not quite as extreme an assertion as optimism in the face of despair, then at least optimism in the face of AI.

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Appendix

Use Case Coding

Example	Use	AI Technology	AI	Secondary AI (if applicable)	Organization	Speaker	Function - RESEARCH AND ADD OFFICIAL DEFINITIONS	Purpose(s)	Editorial or Operational	Challenges	Notes
Turkey Earthquakes	Scans footage submitted by civilian journalists post-earthquake and identifies resulting elements such as rubble, distinguishing from other events such demolitions, and automates the archival and retrieval of footage	Computer Vision	Computer Vision		Al Jazeera	Grant Totten	Identifies and interprets elements of images and videos into data points such as location, what is happening in image etc (incorporates reverse image search)	Automation of archiving and access to content Confirms location of event Distinction between events Reduces fake news	Editorial	Financial	
Kashmir Protests	Journalist used footage of protests without checking location of video. AI would identify location of footage via background information and contexts	Computer Vision	Computer Vision		Al Jazeera	Grant Totten	Identifies and interprets elements of images and videos into data points such as location, what is happening in image etc (incorporates reverse image search)	Automation of archiving and access to content Confirms location of event Distinction between events Reduces fake news	Editorial	Financial	Could also distinguish between event on microscale such as riots at protests
Turkey Earthquakes	Scans footage submitted by civilian journalists post-earthquake and identifies elements that cannot be shown in news footage (ie, dead or injured bodies, blood etc)	Live Analysis	Computer Vision		Al Jazeera	Grant Totten	Identifies elements of content that cannot be shown in news and flags to operators before airing	Reduces harm to journalists and editorial staff Ensures audiences are not exposed to damaging content Allows content to meet legal and ethical regulations	Editorial		May be trained to a specific countries' priorities or ethical codes and thus not relevant to given countries editorial line
Shooting in South Africa	Scans footage of shooting and using indicative data points such as shots fired and location of footage to flag if an event such as a killing is about to occur	Predictive Analysis	Computer Vision		Al Jazeera	Grant Totten	Predicts events that cannot be shown in news and flags to operators before airing	Reduces harm to journalists and editorial staff Ensures audiences are not exposed to damaging content Allows content to meet legal and ethical regulations	Editorial		May be trained to a specific countries' priorities or ethical codes
Council Meeting Minutes	Listens to council meeting minutes and flags if content discussed is significant to a story, and predicts if events are about to occur that require coverage	Language Analysis	Speech Recognition	Machine Learning	BBC	Laura Ellis	Transcribes video or audio and analyses to identify points of interest or importance that can be flagged for stories, and contextualising with past stories to identify if event is of significance or not	Automates transcription Flags points of interest for stories Predicts and preempts newsworthy events	Editorial	Encoded bias	Could also be used for Office Care Policy Commission

Council Meeting Minutes	Listens to council meeting minutes and flags if content discussed is significant to a story, and predicts if events are about to occur that require coverage	Language Analysis	Speech Recognition	Machine Learning	BBC	Laura Ellis	Transcribes video or audio and analyses to identify points of interest or importance that can be flagged for stories, and contextualising with past stories to identify if event is of significance or not	Automates transcription Flags points of interest for stories Predicts and preempts newsworthy events	Editorial	Encoded bias	Could also be used for Older Care Policy Commission
Recommender Algorithms	Reader accesses an article about suicide or self-harm and resulting similar articles are promoted to them by the recommender algorithm	Personalization AI	Machine Learning		BBC	Laura Ellis	Assesses and analyses user's past behaviour to predict what content will appeal to them	Maintain's viewer interaction and attention and promote	Operational	May promote damaging or harmful content Encourage addiction to content May create echo chamber of information	
Consumption Habits Personal	Goes beyond predicting articles or subjects of interest to reader, to identifying their preferred method of consumption (ie images, bullet points) and tailors an article to their consumption jobs	Personalization AI	Machine Learning		BBC	Laura Ellis	Assesses and analyses user's past behaviour and consumption habits to predict what style of article will appeal to them	Maintain's viewer interaction and attention and promote	Operational /		
Spring Watch	Live footage of wildlife in habitat is analysed and events such as birth or mating are flagged in order to be used in footage	Live Analysis	Computer Vision		BBC	Laura Ellis	Identifies and analyses content of videos and images to determine what is happening and flag up notable events	Flags events to journalists	Editorial	Financial	
Alcoholics Anonymous Interv	The faces of participants from Alcoholics Anonymous are replaced with computer generated faces	Deepfakes (GANs)	Computer Vision	Machine Learning	BBC	Laura Ellis	Deep learning algorithms identify data points and resulting edit images or entirely swap faces and bodies within video content	Replace individual's identities while not entirely anonymous Retains anonymity	Editorial	Identify fraud Fake news	
BBC Weather	Viewers can choose the presenter of their weather content, either from preexisting presenters or entirely digitally generated ones	Deepfakes (GANs)	Computer Vision	Machine Learning	BBC	Laura Ellis	Deep learning algorithms identify data points and resulting edit images or entirely swap faces and bodies within video content	Generates content Allows user personalisation Potential to promote diversity and representation	Editorial	Identify fraud Fake news Use by racists	
Story Generation	Generates prompts or angles for articles based around prompts or events predicted to be of significance	Language Genera	Natural Language Processing		BBC	Laura Ellis	Uses NLP to generate natural human speech	Generate prompts for news stories	Editorial	Fake news Replacing journalists by generating whole articles Loss of creativity	
RTÉ Investigates	Scanned public data like company registration, tender responses etc, and predicted a local councillor was taking bribes, then used investigative journalism to uncover local corruption surrounding planning permissions and similar processes	Predictive Analysis	Machine Learning	Speech Recognition	RTÉ	Conrad Goutus an	Uses language recognition to scan and interpret data and ML to perform predictive analysis and identify potential leads	Identifies potential leads Automates mass analysis of data	Editorial	Financial	Funded by Google Digital News Initiative (DNI)
Gender balance	Scans video and audio content from sports coverage and identifies gender balance	Computer Vision	Computer Vision		RTÉ	Conrad Goutus an	Uses computer vision to analyse video and audio and identify the gender divide in coverage	Assess in DEI measures Automates internal reports	Operational	Financial Narrow / coded version of gender	
Archival automation	Digitizes archive by watching hundreds of thousands of hours of archived footage and analysing to determine content and metadata, and filing accordingly	Computer Vision	Computer Vision	Machine Learning	RTÉ	Conrad Goutus an	Use computer vision to analyse content and identify metadata in order to provide content description for archival	Automates process of watching masses of content Automates archival process	Operational	Potential for replacement of archival jobs	
Accessibility	Automates generation of accessibility services such as closed captioning, audio description, and signing	Access Services	Computer Vision	Natural Language	RTÉ	Conrad Goutus an	Analyses content and produces captions, audio description, and signing	Automates process of providing access services Provides value without increasing headcount or costs	Operational	Reduction in available specialized jobs?	Also uses ML (deep fakes/GANs) to generate signi
Corporate Earning Reports	Generates annual earning report articles on companies from large data sets	Automated Writing	Natural Language Processing		AP	Aimee Reinhart	Automates text stories from structured sets of data using natural language generation (NLG)	Automated process of reviewing data	Editorial		Early use of A starting in 201
Public Safety Incidents	Automates writing of public safety incidents into the content management system	Automated Writing	Natural Language Processing		AP	Aimee Reinhart	Flags information on safety incidents and automates text generation	Identifies safety incidents Generates and logs text	Editorial		Minnesota newspaper Brainand Dispatch
Tip Sorting	Sorts new tips and coverage pitches submitted by the public and automatically populates them into a coverage planner	Language Analysis	Natural Language	Machine Learning	AP	Aimee Reinhart	Analyses tips and flags points of interest, before assessing priority and populating coverage planner	Analyses tips and pitches Sorts tips and pitches by priority and identifies stories c	Operational		Allentown, Pennsylvania television station WFMY-TV
Council Meeting Minutes	Uses Minutes application to create transcripts of city council meetings, and then creates summarization, keyword identification, and reporter alerts for staff	Language Analysis	Natural Language Processing		AP	Aimee Reinhart	Transcribes video or audio and analyses and generates summaries and identifies points of interest or importance that can be flagged for stories	Automates transcription Flags points of interest for stories	Editorial		Michigan Radio's WUOM-FM a the University Michigan
Automatic Subtitling	Automates transcription of recorded videos and generates subtitles to be reviewed by staff for release	Subtitling	Speech Recognition		SVT	Mikaela Astrand	Automates transcription of recorded videos and generates subtitles	Automates transcription Generates subtitles	Editorial	Difficulty understanding regional accents and Swedish second language speakers	
Archival Search	User searches for footage of former PM Olof Palme, or current PM Ulf Kristensson, the technology reviews and analyses old and recent video and audio content and identifies a match	Computer Vision	Computer Vision		SVT	Mikaela Astrand	Performs facial recognition, named entity recognition, optical character recognition, and transcription in order to extract metadata from content and record archival	Automation of archiving and access to content Confirms location of event	Operational	Financial	

Interview Guide

Below is a template interview guide I used throughout the course of interviews, though it should be noted that for each participant I tailored interview questions to their areas of interest, knowledge, and expertise. As such, while these leading questions acted as a starting point, and guide to fall back on, in individual interviews the questions varied and deviated from the original guide.

- INTRO
 - How do you define AI?
 - What has been the experience of AI within your organisation?
 - Tell me about the AI projects you have worked on.
 - What AI programs / technologies are currently under development?

- Which AI technologies do you view as the most beneficial to news media currently?
 - From your personal perspective, how does AI benefit news media organisations?
 - What are the cons of AI for news media organisations?
- APPLICATIONS (predominantly on operational side)
 - How prepared are news media organisations at large for the introduction of AI technologies? (logistically, financially, attitudes etc)
 - How do you view AI as beneficial to the editorial / journalistic side vs the operational capacities of news organisations?
 - Do you perceive a difference in attitudes towards AI from a journalistic vs operational perspective?
 - To what extent does AI technology still require human intervention?
 - What are obstacles to the deployment of AI technologies in news media organisations?
 - What do you classify as the time frame for AI rollout / maturity point within the media industry?
- IMPLICATIONS
 - What are the ethical responsibilities of AI use and strategy within the news media industry from your perspective?
 - How do you account for such ethical responsibilities in the development and deployment of AI technologies?
 - How do you personally see AI changing journalism and the media industry, if at all?
 - How has AI technology already changed the way that strategy is developed and deployed?
 - Which AI technologies do you view as the ones with the most transformative power?
- CONCLUDING
 - Are there any elements of the discourse around AI that you view as overhyped?

Interview Tracker

While contacting interview participants I recorded my contact process in an excel spreadsheet. This allowed me to keep track of who I had contacted, their information and willingness to participate. The below example of this tracker includes the participating interviewees.

Name	Contact	Found via	Role	Organization	Response	Interview date
Grant Totten	Linkedin	Reference	Head of Cloud, Analytics, and Insight	Al Jazeera	Yes	March 14th
Laura Ellis	Linkedin	Linkedin	BBC Head of Technology Forecasting	BBC	Yes	March 17th, 12:00 GMT
Aimee Rinehart	Linkedin	Linkedin	Local News AI Program Manager	AP	Yes	March 28th, 15:30
Mikaela Åstrand	Linkedin	Linkedin	AI/ML Engineer at SVT	SVT	Yes	April 3rd, 15:00
Richard Waghorr	Linkedin	Linkedin	Chief Technical Officer	RTÉ	Yes	March 28th, 16:30
John*	Email	Reference	Senior Technology Manager	RTÉ	Yes	March 28th, 16:30
Dalia Hashim	Linkedin	SXSW Panel	AI and Media Integrity Program Lead	Partnership on A	Yes	April 3rd, 14:00

Opportunities During Research

During my research process I was given the opportunity to present some of my findings as a work in progress at a digital session on AI Tools for Creative Processes hosted by the Emerging Media Community of Practice (EMCoP) at the University of British Columbia. The presentation offered a valuable opportunity to synthesise some of my findings, and engage with others in the AI space with interest in my work. A second valuable opportunity arose with the Nordic AI in Media summit, hosted by the Nordic AI Journalism network in Copenhagen. At this summit I met with news and media practitioners from organisations across the Nordic regions and beyond, and was able to attend several talks on the use and integration of AI into the media industry and network with both working professionals and eminent academics, several of whom actually contributed to works cited in this paper. While this summit was too close to the submission deadline of this thesis to become a major research source, it did allow me to see many of the theories I have been reading and writing about in practice, and demonstrated the relevance of this thesis and my research in professional settings.

Nvivo Coding

I performed my coding within Nvivo, a qualitative research coding software. Below is a photo of my coding scheme I used within the software become narrowing down my codes

Name	Files	References	Created on	Created by	Modified on	Modified by
Actors	0	0	31/03/2023 14:13	OM	31/03/2023 14:13	OM
Collab.	4	11	31/03/2023 14:18	OM	07/04/2023 12:58	OM
Org. Structure	5	16	31/03/2023 14:17	OM	07/04/2023 13:27	OM
Tech. Dev.	6	18	31/03/2023 14:18	OM	07/04/2023 13:04	OM
Use	4	12	31/03/2023 14:17	OM	07/04/2023 13:11	OM
Applications	0	0	31/03/2023 14:13	OM	31/03/2023 14:13	OM
Obstacles	4	13	31/03/2023 14:15	OM	07/04/2023 13:08	OM
Percep.	6	30	31/03/2023 14:15	OM	07/04/2023 13:26	OM
Strategy	3	8	31/03/2023 14:39	OM	07/04/2023 13:33	OM
Tech. Des.	5	9	31/03/2023 14:14	OM	07/04/2023 13:00	OM
Use Case	5	34	31/03/2023 14:15	OM	07/04/2023 13:22	OM
Implications	1	1	31/03/2023 14:13	OM	07/04/2023 12:45	OM
Consideration	6	53	31/03/2023 14:16	OM	07/04/2023 13:34	OM
Effect	6	41	31/03/2023 14:16	OM	07/04/2023 13:29	OM
Regulation	6	17	31/03/2023 14:16	OM	07/04/2023 13:25	OM
Key Quotes	5	13	31/03/2023 14:20	OM	07/04/2023 13:28	OM

Below is an example of a coded interview with coding density featured on the right hand side.

The screenshot shows a transcription tool interface. The main window displays a transcript of an interview with several paragraphs of text. Some text is highlighted in yellow. On the right side, there is a 'CODE STRIPES' sidebar. This sidebar lists various coding categories, each represented by a colored dot and a vertical line of varying height, indicating the density of that category in the text. The categories listed are: Tech. Des. (blue), Consideration (green), Regulation (purple), Use Case (orange), Percep. (red), Obstacles (yellow), Use (purple), Strategy (green), Key Quotes (blue), and Effect (red).

Below is an example of a coding category (Collaboration) and the quotes coded to this category from across interviews

The screenshot shows a coding tool interface for the 'Collab.' category. It displays a list of references with their respective coverage percentages. The first reference is from '<Files\Dalia Hashim Transcript>' with 1 reference coded (4.77% Coverage). The second reference is from '<Files\Grant Totten Transcript>' with 6 references coded (7.63% Coverage). Below each reference, there is a section for 'Reference 1' with its coverage percentage.

Reference 1 - 4.77% Coverage

the thing that is unique about partnership on AI specifically is that we are a convening body in a lot of ways, so a lot of the times when we are creating a lot of these guidebooks or responsible AI tools, what we tend to do is we tend to bring everyone around the table, so we say, OK, like let's bring around the table, in my case, you know, local news organizations, established news organizations on like a national scale or whatever. Academics, tech companies, social media platforms, civil society. Let's bring everyone around the table and say, OK, from your perspective, what does, you know, responsible AI look like? What are the challenges that you've been facing? How would this work for you? Is this kind of, you know as a news organization are we asking too much of those types of questions. And for me specifically, a lot of my work is informed by a steering committee that I've put together to kind of run a lot of that content by them and get their feedback and their input on all the work that I do.

Reference 1 - 0.55% Coverage

In this case what we wanted to do and we did this actually for an accelerator as part of IRC's accelerator

