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"Our Main Tools are (Still) Our Brains":

Local Journalists' Adoption of Artificial Intelligence in Two

European Countries

Thesis by Iida Salonurmi

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Supervisor: Anouk de Jong

Abstract

Introduction: The journalistic and media fields have undergone stormy times in the past decades with digitalization and the changing media landscape. This hit has been hard, especially on the local news media. As ChatGPT has made AI's way into the hands of different journalists and media professionals, the question arises, how is it going to be used?

Aim: This study looks into how local journalists use and adopt artificial intelligence tools in different tasks in their work, and what factors affect this process.

Method: 13 local journalists or editors from the Netherlands and Finland were interviewed to research this. The interview structure was based on the Unified Theory of Acceptance and Use of Technology (UTAUT), modified based on the implications for AI. The interviews were coded using a thematic approach.

Results: AI is still in the first stages in many local newsrooms. Management levels are developing guidelines for its use and rolling out in-house applications. Journalists have mainly explored tools assisting their information-gathering or writing process, although they are generally interested in AI. Ethical considerations and the suitability of these tools for the needs of journalists tend to hinder their large-scale adoption.

Conclusion: AI arrives at the local newsrooms as a continuation of digital disruption. Local journalists are not willing to speculate on the future, which comes from a lack of knowledge and distancing from the development of these tools. Human is required to be kept 'in the loop' in local journalism in the future as well.

Practical Implications: Organizational AI adoption in newsrooms should be done considering the level of digital skills among journalists and the needs of the newsroom. Journalists should be integrated into the development of tools, but to do this they would require organizational training in the technology to understand its practical and ethical sides.

Keywords: Journalistic Innovation, Local Journalism, AI, Technology Adoption

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"Our Main Tools are (Still) Our Brains": Local Journalists' Adoption of Artificial Intelligence in Two European Countries

Artificial Intelligence (AI) has been a point of attention over industry lines for the past couple of years, especially following the launch of OpenAI's ChatGPT chatbot in December 2022 (OpenAI, 2022). This introduction of a chatbot based on generative AI opened a new stage in the public's understanding of AI. Before this already, AI was predicted to transform the foundations of almost all industries, including journalism and media. The technologies understood as artificial intelligence, have previously had effects in health, security, food and automotive sectors for instance. It has also decreased trust in job stability in certain professions and brought with it certain ethical problems, that have raised resistance against it. This was also the case for journalism and media, industries that got convicted to get automated by the new technologies.

The definition of artificial intelligence has been fluid in the scientific literature. It has been hard to define since AI tools vary widely in their nature and technology. However, the European Commission's High-Level Expert Group on Artificial Intelligence proposes a general definition of AI that understands it as an umbrella term for technologies such as machine learning, robotics and reasoning. Moreover:

> *"Artificial intelligence (AI) refers to systems designed by humans that, given a complex goal, act in the physical or digital world by perceiving their environment, interpreting the collected structured or unstructured data, reasoning on the knowledge derived from this data and deciding the best action(s) to take (according to pre-defined parameters) to achieve the given goal. AI systems can also be designed to learn to adapt their behaviour by analysing how the environment is affected by their previous actions."*

While AI, its development, and its effects on different parts of society continue to be a growing field of interest, it is also a continuously changing landscape of information due to the rapid developments in these technologies. Especially the ease of use of the newest versions of generative AI makes it more widespread among the public, and in specific professional fields, which has opened new directions for academic interests. Calls have been made to focus especially on the generative AI tools in future research (Pavlik, 2023; Schäfer, 2023). Therefore, these technologies should be "investigated, assessed, and critically examined" (Pavlik, 2023).

Generative AI has "increased agency" for which the communication with it should be examined from different perspectives. AI tools have generally been predicted to make work more effective in many fields, since they can take up a lot of routine tasks, freeing up space for more creative tasks requiring human touch. On the other hand, since its first versions, developments in AI technologies have also been predicted to lead to job loss in different industries, making humans unnecessary in the processes. These technologies have also been studied in depth regarding their different biases (Birhane, 2021). While AI continues to develop, it is important to balance the possibilities with a critical evaluation of its effects.

The media plays a big role in the public discussion of AI, especially with the developments in generative AI. While they can affect the opinions of the public by presenting AI tools as a blessing or a curse for society, there is also a discussion about the effects these technologies have on the creation of the news. The implementation of AI tools into the work of journalists can be seen as a continuation of the transformative process of the digital transition in the field. With the growing impact of social media and the digitalization of different fields, newsrooms have found themselves in a tough place. The circulation of traditional print publications has plummeted, especially since younger generations are less likely to pay for their news, and the fast pace of the news cycle due to social media has put

pressure on journalists to create more news faster. This transition has been especially rough on generally more print-reliant local newspapers with smaller resources to implement new digital measures.

Local journalism is a field that has distinct characteristics from the rest of the journalistic field. It can be seen as the glue for the community or possibly even the "watchdog" of local decision-making. It has a more specified geographical or imagined local community that it provides for than national or international news production. Gulyas & Hess (2023) theorize that especially in terms of the digital transition, local journalism is characterized by "the three C's: community, commitment and continuity". These are the important focus points that local journalism is expected to nurture. Heiselberg & Hopmann's (2024) study on audiences' expectations from local newspapers indicates that the audience values especially the "symbolic and emotional values" of these publications. On the other hand, they also have functional reasons for existence, which are appreciated by the non-paying audience, such as providing information for the community. Therefore, local journalism holds multiple levels of purpose that it needs to balance now, going through turbulent times.

The field of local journalism differs widely depending on the national context. According to a study by Park et al. (2021) in the United States, trust and pre-existing subscriptions to local news affect the willingness to pay for local news. These factors played a notably greater role in the consumption of local news than on a national scale. For this study, two national contexts are chosen. Finland and the Netherlands both have indications of high trust for local news and a long history of print subscription (Jenkins & Nielsen, 2020; Jyrkiäinen, 2012). The local newspaper markets in these countries appear more stable, which is beneficial to studying such an academically novel topic as artificial intelligence. Digitalization is also on one of the highest levels in these countries, with Finland placing 1st

and the Netherlands 3rd in the European Digital Economy and Society Index, suggesting that adopting these new technologies in fields such as journalism is possible (The Digital Economy and Society Index (DESI), 2023). Given these conditions, Finland and the Netherlands present ideal contexts for exploring the intersection of local journalism and artificial intelligence.

The Research Questions

While there are a lot of predictions on the future of journalism, especially in the time of generative and other types of AI, there is little research on the current state. Earlier studies have touched upon journalists' perceptions of and attitudes towards AI as a larger phenomenon (e.g. Bastian et al., 2021; Kim & Kim, 2018; Noain-Sánchez, 2022; Soto-Sanfiel et al., 2022) as well as focused on case studies of specific AI technologies (e.g. Petridis et al., 2023; Thäsler-Kordonouri & Barling, 2023). The most comprehensive view on the actual state of adoption of AI tools is given by a global report published by JournalismAI (2023). Aside from this, however, there is not much understanding of the ways that journalists use generative AI in their work. There is even less when it comes to local journalism, which is generally an understudied subfield (Hess & Waller, 2018).

Therefore, this study will investigate the following research questions:

RQ1: How do local news journalists use AI in their work?

RQ2: How do internal and external factors affect the adoption of AI for local news journalists?

This paper is organized as follows. The main theoretical concepts guiding the framework of this study will be described in the next chapter. Afterwards, the methods that the data collection and analysis are based on are explained, which includes the study design, its sample, procedure, and data analysis methods. This is followed by laying out the results of

the study. Lastly, this paper will include a discussion and conclusion bringing together the most important findings and their implications.

Theoretical Framework

Local journalists' adoption of Artificial Intelligence is discussed through different theoretical lenses. Firstly, the field of local journalism will be discussed in the contexts of the two countries and the digital transition. The development and adoption of AI tools are seen as a continuation of the digital transition that has been taking place in the industry already for the past decades. After this, existing research on AI in the field of journalism is discussed as well as the predictions for its uses and effects. Lastly, theoretical background will be presented from the discipline of Human-Technology Interaction, which will be used to inform the structure of the interviews.

Local Journalism in Finland

Journalism in Finland is characterized by a high level of press freedom and trust in media. It has been defined, together with the other large Nordic countries, to be a "media welfare state", where the media is held accountable by society, compared to the state or the market (Grönlund et al, 2024). According to the globally conducted Digital News Report (2023), local newspapers hold 81% brand trust, with 17% of citizens indicating that they consume local newspapers' content offline and 12% online weekly. While the country's local newspapers have been experiencing some economic hardship along with the industry in a larger scope, they have still been able to cope with the changing times so far, possibly because of the strong tradition of print subscription and trust in the news (Sjøvaag & Owren, 2021).

The country has a strong public broadcasting service that provides regional news, and a wide array of regional, local and hyperlocal newspapers. There are 183 local or city-specific newspapers, according to News Media Finland, a trade association for newspapers in the

country (Sanomalehtihaku - Uutismedian Liitto, 2024). This is a comparably high amount of "paid-for local and regional newspapers" (Grönlund et al, 2024). A large quantity of these is in the ownership of one of the media conglomerates (such as Sanoma, Alma Media, Hilla Group, Keskisuomalainen or TS-Yhtymä), which allows them more resources and economic stability but also decreases the number of independent media.

Finland differs from its neighboring countries in terms of government subsidies towards the local media field. The government has, however, attempted to provide support through indirect measures in the past years to "prevent so-called local news deserts, support the plurality of news content, and promote informed public debate" (*Digital News Report 2023 - Finland*, 2023; Grönlund et al., 2024). The centralization of ownership and state support indicates that the local newspapers require measures to stay afloat in the market.

Local Journalism in the Netherlands

In the Netherlands, similarly to Finland, the trust in news is comparatively high. Digital News Report 2023 shows that the brand trust generally for local or regional newspapers is 75% with 16% of Dutch people reporting weekly news consumption of daily local or regional newspapers offline (*Digital News Report 2023 - Netherlands*, 2023). The Dutch local online news landscape is quite fragmented, thus content published by traditional local or regional newsrooms is reportedly followed weekly online by only 8% of the population. However, the shift from written content is clear, and there is more and more focus on different news media to create more content in audiovisual formats such as podcasts or videos.

Journalism in the Netherlands is therefore largely affected by the digital transition. Aside from TV or radio news, the most followed news media in the country are online-only news sites that also provide news on a regional basis (*Digital News Report 2023 - Netherlands*, 2023). The country's biggest media companies have also taken large steps to

create a profitable future based on online news. One of the initiatives focusing on that is the 'Nederlandse Datakluis' project which attempts to create a safer personal data storage solution to seek independence from big American-based companies such as Google and Meta (Kormelink & Meijer, 2023; De Stichting Nederlandse Datakluis, 2024). This initiative has been started together with 5 of the biggest Dutch media companies - NPO, RTL, Talpa, DPG Media, and Mediahuis – of which two, DPG Media and Mediahuis, own a large part of the local and regional news media in the country.

There is not much (English) literature on the field of local newspapers in the country but, some notions exist of the media being more accountable for the market compared to the Nordic context. This might be due to the neoliberal influences in the country's political climate. While having a strong public broadcasting system, the Netherlands has many commercial news media. An example is the number of hyperlocal news media that increased with the introduction of news in the digital sphere (Kerkhoven & Bakker, 2014). These are especially described as entrepreneurial, small-staffed, and online-only publications, focusing mainly on local topics. The market-forwardness might influence the adoption of AI in the country.

Digital Transition of Local Journalism

The digital transition has been seen as detrimental to the survival of local journalism in the past years. While print has been the lifeline for local newspaper circulation, it will most likely not continue to be as profitable among the young generations (Sjøvaag & Owren, 2021). There is pressure from social media, governments, and the audience for a stronger shift towards forms of digital news from these media houses. However, local news publications experience a variety of obstacles when attempting to answer these requests. While adopting innovations to bring local news to the digital times, journalists must also keep in mind the emotional and symbolic value-making that local journalism provides for its

audience (Heiselberg & Hopmann, 2024). This process from the journalists' point of view has been researched from multiple viewpoints in the past years.

The digital transition has been studied as a disruption to the work of local journalists. Ali et al. (2018) researched small-market newspapers in the United States, gathering insights from experts, journalists, and editors. They found that there were four different groups, that most of the journalists and editors fell into in their response to the transition: "reluctants, users, learners and experimenters". The publication size did not seem to have a relevant effect on the category the practitioner fell into. García-Avilés et al. (2018) also interviewed a sample of journalists in Spain finding five different groups based on the diffusion of innovations (DOI) model defined as "drivers of change, early adopters, laggards, the outsiders, and the resisters". While these studies indicate there are individual differences in how journalists perceive digital tools, it is important to understand the different factors that affect how they can adopt these.

The biggest factors behind the choice to adopt digital tools for local and regional newspapers are "budget, time and people" (Stencel et al., 2014, as cited by Waschková Císarová, 2024). This has especially been studied in the context of digital innovation. While individual journalists' attitudes, knowledge, and willingness affect the adoption, there are also economic and organizational factors that play a role (Stencel et al., 2014, as cited by Waschková Císarová, 2024). In an interview study in the Norwegian local media context, Olsen & Hess (2024) found that innovation was a hard topic of discussion, and local journalists and editors had the tendency to "detach oneself and the local news operation from the development of new digital tools and products". Especially in those media that were part of larger conglomerates, the development was seen as "something that happened at a distance before being rolled out at a local setting". The local newsrooms can therefore feel as though

technological innovation is something out of their reach, that's happening on a higher level with the resources required for it.

While local newsrooms are generally seen as laggers in technological development, there are also existing solutions or ways to cope that have been born in these spaces. This aligns with the idea of technology appropriation, where certain groups take and find new ways to use certain technologies (Mendoza, 2010). Olsen & Hess (2024) found that local newsrooms tend to take innovations adapted on larger scales and repurpose these for their context. This was, however, more often done in the context of content innovations than digital innovations. Their findings also underlined the need for authenticity from their audiences in terms of innovation, as the local newspapers' success is heavily reliant on understanding the needs of their audience. Jenkins & Nielsen (2018) also underlined three different approaches to the digital transition local newspapers, and especially their parent companies take. These were: national scale, referring to building scale by building more largely centralized parent companies with more resources; regional breadth, where the focus is on building a "focused portfolio of editorial and other offers for a particular, often contiguous, region"; and local depth, which is an approach usually taken by independent local newspapers "reporting on smaller geographic areas and in many cases relying on local advertising and print subscriptions". These approaches shed light on larger organizational ways to cope with digital transition and survive in the digitalized world.

Journalism and AI

In the context of journalism, AI implementations have been discussed with different names, such as robot journalism or automated journalism, throughout the past decades (Lindén et al., 2019; Siitonen et al., 2024). These predictions for the development of journalism's automation focused on the automation of the news writing process, which understandably has increased the fear of job loss for professionals. However, in the past

years, with the developments of generative AI, large language models and machine learning in general, the predictions have widened in terms of the expectations of what AI could be used for in journalism. A research initiative, JournalismAI, refers to generative AI as a "subfield of machine learning -- that involves the generation of new data, such as text, images, or code, based on a given set of input data" (2023). These kinds of tools are connected to hopes of making the journalistic process more efficient and possibly cutting costs without removing the human from the process (Noain-Sánchez, 2022). With the growth of generative AI, however, questions of ethical and trustworthy journalism arise, such as who holds the responsibility when it comes to AI-generated news (Kreft et al., 2023). All of this depends in the end on the kinds of tools created for journalists and their adoption of them.

AI tools can be introduced for different parts of the journalistic process. Opdahl et al. (2023) introduced possible (generative) AI implementations that could be used for the journalistic stages of gathering, assessing, creating, and presenting, while keeping the trustworthiness of the news central. In data gathering, AI can aid in seeking information and sources for journalists, which is a process that can consume a large quantity of the journalists' time and resources. As an example, the AngleKindling application was created based on large language models to aid journalists in finding relevant frames from press releases (Petridis et al., 2023). During the assessing stage, different AI tools can support journalists in confirming and understanding the data, its context and meaning. For the news creation process, aside from robot journalism, AI implementations could help enlarge the scope of the news and provide "augmented workflow" or support in live journalism, for instance. There are also a couple of examples of robot or automated journalism, such as Finnish news bots Valtteri and Voitto (Lindén et al., 2019). Lastly, AI tools can play a part in presenting the news to the audience. The effects of this from journalists' point of view have already been researched to some amount, as algorithmic recommendations for news have become more prominent with

the digital transition of news (Bastian et al., 2021; Møller, 2023; Sjøvaag & Owren, 2021). These applications illustrate the variety of already existing as well as still imagined AI tools for journalism.

Based on these journalistic stages, sub-questions are added to the RQ1:

RQ1.1: In what ways do local journalists use AI in the phases of *gathering and assessing* information?

RQ1.2: In what ways do local journalists use AI in the phases of *creating and presenting* news?

In terms of AI use in local journalism, a small number of studies have been made to shed light on the attitudes and problems existing in this context. A case study in Great Britain looked into automated journalism in local newsrooms and found that journalists experienced the impact of an AI solution limited (Thäsler-Kordonouri, 2023). They underlined especially the importance of human impact. It was also mentioned that there is a lack of data suitable for training AI in a local context, as some areas appear better covered than others. This is supported by a study into local data journalism in Germany, which concluded that on the local level problems of data availability are often experienced, and individual journalists' need to have "good relationships with local authorities to be granted access to data" (Stalph et al., 2022). Also, the attitudes towards automation or AI are largely connected to the existential threats of many of these newsrooms. Some see it as a possibility to make the local newsrooms more efficient, thus possibly providing them with a new future (Thäsler-Kordonouri, 2023). On the other hand, a study on Czeck local journalists' attitudes towards innovations found that they believed that digital innovations were the reason for their job insecurity, which led to an unwillingness to adapt (Císařová, 2024).

Acceptance and Adoption of Artificial Intelligence

To study the journalists', use and adoption of artificial intelligence, there are multiple theories that have been utilized as the framework for this specific area of interest. The stages that are usually discussed in terms of the use of new technologies are acceptance, adoption, and appropriation (Mendoza et al., 2010; Venkatesh, 2003). The acceptance stage in the context of this study refers to the journalists' attitudes towards AI technologies in general, and the actual use of different tools is analyzed through the lens of the adoption of AI. This study will not have a central focus on the appropriation of AI, as it is predicted that AI has not been adopted widely enough for this lens to be applied at this stage. However, appropriation could be used to describe more tech-savvy local journalists' creative implementations of AI tools for their local cultural and socio-economical context for instance (Makwambeni et al., 2023). These three stages have been created from the base of multiple human-technology interaction theories that are further elaborated on in this chapter.

A prominent theory used to analyze the adoption of new technologies on a larger scale has been the Diffusion of innovations (DOI) model, which describes the diffusion of innovations in society by categorizing individual users into five categories. These are based on the point at which they adopt the technology. García-Avilés et al. (2018) used this model as a base while creating a model for digitalization in media outlets. They found out that journalists play a big part in the general diffusion of innovations among the newsrooms with their actions. However, they found that there are obstacles that may affect this coming from the organizational structures around them or from their motivation or fear. This model can be beneficial in understanding the journalists' attitudes towards general digital transition. However, in the local context, it provides too broad a framework to understand the factors that pay into the adoption of new tools.

The Technology Acceptance Model (TAM) is used, on the other hand, to predict technology use in a professional setting by using two concepts as predictors: perceived ease of use and perceived usefulness (Davis, 1986). A study conducted by Makwambeni et al. (2023) utilized this as a framework together with the technology appropriation theory for their study on journalistic perceptions of AI in the South African context. In the study, the focus was on radio journalism, where the appropriation of AI was mainly relevant for audio content editing. Their main findings described that the journalists fall into two categories: one side is 'euphoric' and ready to adopt AI, while the other side holds dystopic images of the future with the AI that mixes with fear of job loss and deprivation of journalistic values. The study's sample focuses on young journalists specifically, which allows for studying AI appropriation as these generations tend to adopt technology earlier. While the TAM is widely recognized, so are the theories that have utilized it as a base, including new concepts to increase its predicting power.

Originally based on the TAM, the Unified Theory of Acceptance and Use of Technology (UTAUT) was combined at the beginning of the century by Venkatesh et al. (2003) to better recognize the factors predicting the adoption of technologies specifically in the professional context. While the TAM focuses purely on the individuals' internal reasons that predict this activity, UTAUT takes into account also the external reasons motivating the person as well as mediating factors. UTAUT therefore includes the original predictors in the form of "performance expectancy" (perceived usefulness) and "effort expectancy" (perceived ease of use). Expanding from the original the theory includes "social influence", "facilitating conditions" as well as demographical factors as moderators for the use behavior. Social influence is the effect of for example coworkers' choices or opinions of the technology at hand, and facilitating conditions refer to the objective organizational or wider contextual conditions such as policies or in-house AI tools, that make the technology use easier. The

demographical effects that have been seen to affect the acceptance and use are age, gender, voluntariness of use, and experience with technology. This broader theory has been seen to have better predicting capability than the original technology acceptance model.

Figure 1

UTAUT Model with Research Directions for AI Research (Venkatesh, 2022)
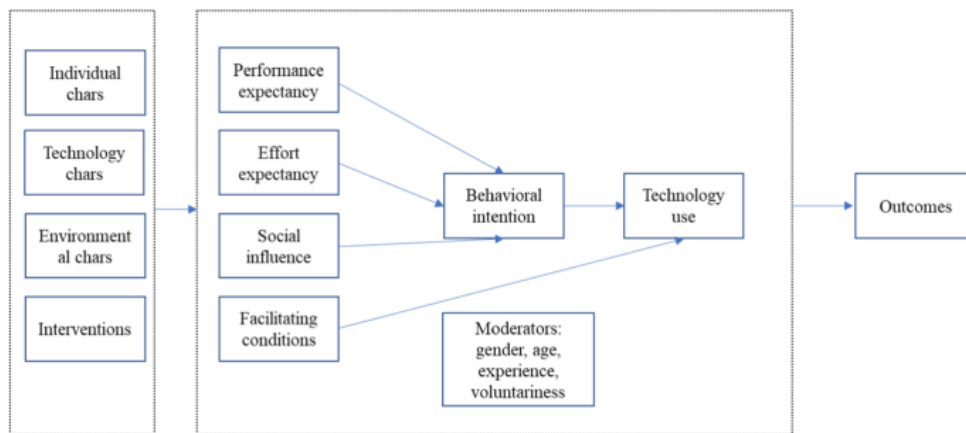
This theory has been revisited multiple times since its first version, and the introduction of AI has again created new pressure to revise its predictive powers in the changing technological landscape. Most recently Venkatesh (2022) proposed that in conjunction with AI acceptance in a professional context, interventions, as well as individual, technological, and environmental characteristics should be studied (Figure 1). Individual and technological characteristics refer to the subjective or objective characteristics the journalists or the AI tools available hold that affect their adoption of the technology. Opinions based on real information or beliefs, of ChatGPT for instance, could be designated as technology characteristics. Environmental characteristics on the other hand could refer to organizational AI policies or the availability of local data for the AI models to learn from. Lastly, interventions mean the kind of training and management that the journalists have received

regarding AI. These areas will be analyzed in the interviews in addition to the already existing UTAUT predictors.

Sub-questions are derived for RQ2 from the UTAUT model modified for the AI adoption:

RQ2.1: What are the *individual characteristics* and how do these affect the adoption?

RQ2.2: What are the *technological characteristics* and how do these affect the adoption?

RQ2.3: What are the *environmental characteristics* and how do these affect the adoption?

RQ2.4: What are the *interventions* used and how do these affect the adoption?

Methods

Research Design

Based on the theoretical framework, a qualitative research method was considered best fitting for the study. This allows for exploring the novel subject matter and better-understanding journalists' thought processes considering AI use and adoption. In-depth semi-structured interviews were conducted, which were chosen to enable the interviewer to dive deeper into the constructs coming up during the interviews. The apprehension of adoption processes and the factors contributing to this can vary, which this method allows us to consider. The interviews with local news journalists were expected to give insight into the adoption levels of these new technologies, and different factors to their adoption or non-adoption. As AI as a subject matter is considered up-and-coming, the journalists' reflections on the future were also expected to be discussed in the interviews.

Procedure

The journalists were contacted for the interviews via emails found on the websites of their publications, or LinkedIn, in case journalists' emails were not found. In the first contact,

they were informed of the goal and format of the study, the researcher's contact details, and the voluntary nature of participation. After agreeing to the interview, a date was agreed upon and the journalists were provided a meeting link. They were also sent a document containing information about their rights, data and privacy practices, and possible risks of the study (Appendix A).

Interviews were held online via Zoom, Microsoft Teams or Google Meets platforms, depending on what was the most convenient form for the interviewees. Interviews' length varied between 18-49 minutes, the average length being 27 minutes. Informed consent information was also briefed at the beginning of the interview, and in case the interviewee did not have time before, they could read the full version of the document at this point. They were asked about consent, which was recorded separately from the rest of the interview. After this, the interview started in case consent was given. The interviews were organized by themes based on the theoretical framework. Firstly, demographic questions were presented, and interviewees were asked about their gender, age, experience with AI, occupation status (to confirm they fit in the sample) and their general position towards AI tools for journalism. A question is also presented about the general state of local journalism in their country. Afterwards, the topical questions started by exploring the different predictors of the UTAUT model (Appendix B). These are the performance and effort expectancy, facilitating conditions and social influence. Facilitating conditions were expanded to include questions about the 'interventions' and general 'environmental characteristics' as well. Also, 'technology characteristics', which did not overlap with any original predictors were included as their own category. The interview was finalized with questions about the journalists' predictions on the future implications.

After the interview, data files were transcribed and anonymized of any personal or organizational information and stored in a personal cloud. The original recordings were

deleted after the transcribing, excluding the recording of informed consent. This was to minimize the risks regarding personal data. Transcriptions were furthermore analyzed by coding.

Sample

The sample of this study consisted of local and regional news journalists from the Netherlands and Finland. The sample focused on journalists working in local or regional newsrooms and journalists primarily working on local news topics. The sample ruled out employees from local news publications having no full-time employed journalists. During the process of contacting the interviewees, the sample was decided to be extended to the editors of the newsrooms as well. This was done because especially in the smallest newsrooms the number of journalists as well as the level of AI adoption was considered so low, that it would have not been realistic to gather enough insights based on the original sample. The development of AI frameworks for individual newsrooms was also recognized to be currently developed mainly by the editorial teams, so interviewing them allowed for a better insight into what is to come. The sampling process is done using the purposive sampling method, to ensure that the participants fill the criteria for the study. The sample attempts to equally fill the quotas for including journalists: from both countries, scopes of newsrooms, geographically varying locations, and of different age groups and genders.

The invitation to participate was sent to 35 editorial email addresses, 43 personal email addresses, and around 50 individuals on LinkedIn. In the end, the sample included 13 participants, of which 6 were from the Netherlands and 7 from Finland as seen in Table 1. Of these the youngest interviewee was 26 years old and the oldest 63. Interviewees were journalists currently working in local or regional news media aside from 4 interviewees who were a part of the editorial teams.

Table 1

Sample Attributes

Attribute	Finland	The Netherlands	Total
Female	6	2	8
Male	1	4	5
Age: 20-35	2	4	6
Age: 36-50	1	1	2
Age: 51+	4	1	5
Little AI Experience	5	2	7
Somewhat Little AI Experience	2	0	2
Somewhat Much AI Experience	0	2	2
Much AI Experience	0	2	2
Local Newsroom	4	1	5
Regional Newsroom	2	4	6
Local Public Broadcaster	1	1	2

Data Analysis and Coding

A thematic approach was used for the analysis of the interviews. This approach allowed for a more open approach to findings, compared to theories, such as grounded theory which seeks to create a complete theory at the end of the research process (Braun & Clarke, 2006). This study did not attempt to create a complete theory seeing its scope and explorative nature, and therefore thematic approach was seen to fit well for the purpose.

Before coding, the oral interviews were transcribed digitally in verbal form. This was done by Microsoft Teams in the instances, where it was used for conducting the interview. The Good Tape application was used when automatic transcription was not available or when the transcription provided by Microsoft Teams was not sufficient. Whenever this application was used, the transcription was deleted from the application immediately once it was checked.

AtlasTI was used for the coding of the transcriptions. An initial codebook was created based on the theoretical framework. However, after engaging with the data, this was developed further. The final codebook included 7 categories, namely: Demographics, Journalistic Stages, Views on the Future, Environmental Characteristics, Technological Characteristics, Individual Characteristics, and Interventions (Appendix C). The journalistic stages category was used to divide the mentioned AI use purposes by journalistic stage. Future views codes were for whenever journalists discussed utopic, neutral, or dystopian views of the future in terms of AI. The four last categories were directly from the proposed research directions for AI according to the UTAUT model. Each of these was also divided further into codes that described interviewees' answers regarding that topic, for instance, environmental characteristics fell under the codes of *data availability*, *rules and regulations, organizational AI strategy*, *economic pressure*, and *digital transition*. The complete coding categories can be found in Appendix C.

To confirm the codes found using thematic analysis were reliable, intercoder reliability was assessed with Cronbach's Alpha. Another researcher was asked to code 10% of the data (2 interviews) using the codebook created by the researcher. This was measured for each coding category separately (Table 2). To be sufficient, values are expected to place between 6.1 and 8.0, which most of the categories fell in between (McHugh, 2012). The average value for all categories was .66. Only the 'individual characteristic' category with no subcodes remained under this threshold. However, it appears only in 5 instances in the intercoder test material, for which its measurement is not reliable in the same way.

Table 2

Cronbach's Alpha Values per Coding Category

Coding Category	Cronbach's Alpha
Demographics	0.74
Journalistic Stages	0.66
Views on Future	0.62
Environmental Characteristics	0.67
Interventions	0.67
Technology Characteristics	0.7
Individual Characteristics	0.54
Average	0.66

Results

In the results section, the findings from the interviews will be discussed by coding categories. Firstly, individual characteristics are discussed shortly, in conjunction with the moderators from the UTAUT model. Then, the focus is on the purposes that AI was used for by the journalists. This is followed by the journalists' perceptions of the technological characteristics. Environmental characteristics will be discussed afterwards to broaden the perspective of the analysis to organizations and the local context. This discussion is combined with the interventions, which will focus on the types of training received. Lastly, the results will be closed with the views of the future; what utopic and dystopic views consist of in terms of artificial intelligence.

Individual Characteristics

Turning out to be the smallest category, "individual traits" was a code used to analyze any personality traits or attributes that affected people's adoption of AI tools. The main characteristics that were mentioned in the interviews discussed the age or digital skills of journalists. In some of the newsrooms, it could be seen that older journalists might not be so

interested in experimenting with new tools by themselves. They also might hold beliefs that this technology would work against them in the long run, affecting their job stability, more than the journalists of younger generations. Therefore, some older interviewees mentioned that they were expecting to see the younger journalists take up these tools before them, after which they could learn from them.

Although the general willingness to adopt was defined as "cautiously excited" by multiple journalists, their knowledge of and experience with the new technologies affected the adoption rate and ability to imagine future innovation. This led interviewees with little use experience to take steps back from the technology after encountering bad performance. They could, for example, have tried to experiment with ChatGPT in its early days, which did not turn out as well as they expected and led to neglecting the technology afterwards.

Job specifications affected the AI adoption as well. Journalists focusing on investigative or data-centric reporting have been at the forefront of using AI tools in many newsrooms. Similarly, some graphic departments seemed to have been already experimenting with the technology before the rest of the employees. Lastly, it appeared in a few interviews that people working on radio or television news had also interacted with AI tools more than generalist reporters. This was illustrated by a Finnish interviewee, who mentioned most of their newsroom has not adopted AI tools yet:

> *"The others I don't know about except for our journalist who is familiar with the data, and then the one graphic designer or probably the other one who is covering for us(..). I know for sure that they use and are into it in a completely different way than [others]."* (Interviewee 8, FI)

Use of AI in Different Journalistic Phases

The tools journalists used in their work were divided based on the journalistic phase they fell under, as defined earlier. When it came to individual tools that were described, the

lines between the phases became blurred. This was mostly the case between the phases of gathering and assessing, as well as between creating and presenting. Therefore, the results will be discussed here in these two pairings. It should be noted that journalists with little experience with AI tools usually had only experimented with AI. They had played around with ChatGPT or other generative AI to write articles and headlines or ask different questions. As this is not necessarily part of the professional adoption process, this will not be discussed further in this section. Seeing that the variety of the purposes and tools mentioned in interviews was large, a comprehensive list is presented in Table 3.

There were a couple of prominent text-based tools across the two countries for information gathering and assessing. Firstly, tools to transcribe interviews were brought up in almost every interview. They were already adopted by many journalists as well. It was described as a task that can be efficiently and easily automated. Especially an online tool called Good Tapes was mentioned in the interviews with the Dutch journalists as well as a few Finnish ones. A few other purposes for these two phases were using generative AI tools such as ChatGPT for information gathering, coming up with interview questions, translating text, or summarizing and simplifying documents. An interviewee mentioned that rather than using ChatGPT for searching for information, a lot of journalists have taken up other tools that provide them with sources, such as Perplexity AI.

Another big topic for gathering and assessing was data gathering and analysis. Different AI tools were used to scrape local data from external sources. This could be done for example as a one-time experiment for certain projects or to provide the newsroom with a continuous flow of information on local politics or football club news. This was explained in an interview: *"It's also a thing we are working on. Is like an AI scraper of social media messages of organizations, local football clubs, (..) all things local (..) [It] makes like articles (..) by itself, so we have also [a fluent news offer] from little villages."* (Journalist 10, NL)

This could provide generalist journalists the possibility to make more data-based journalism from their areas.

In terms of creating and presenting, the introduction of generative AI can have a large variety of applications. Actual 'robot journalism' where the AI would write a complete article was mentioned mainly in conjunction with data scraping and analysis. However, most of the time journalists preferred tools that work as an aid in writing. Headline and introduction sentence editing tools were also a typical use of AI. ChatGPT was used by most of the journalists as a base for larger text-editing, apart from those journalists whose organizations provided them with in-house tools. These tools usually included at least summarizing, tone-defining, and headline-suggesting capabilities.

AI was also used to adapt the news for different audiences and platforms. This was especially in the form of creating for instance Teletext, live feed or social media applicable summaries based on longer articles. An interviewee predicted this: "*I do believe that more and more online stories in particular will be refined with the help of artificial intelligence, and maybe I believe that it will be used to find ways to get more readers online and make the stories more interesting and better.*" (Interview 9, FI) A few newsrooms also had taken up AI translating to cater better for their multicultural or border-area audiences. AI tools can therefore work in helping newsrooms further adapt to the requirements of the digital transition or other local requirements.

Some newsrooms have also experimented with visual or audio-visual AI applications. This meant creating AI pictures for (online) articles when applicable ones could not be found or extending pictures with the help of AI to fit the required dimensions. In the latter application, AI would suggest what is outside the existing borders of the image. AI could also help in creating data graphics, which worked as a helpful tool to make some articles more customer-friendly. A few experimental applications of AI news reading for radio or social

media video clips were also mentioned, although these were not continued in many cases. Different ethical and practical considerations were mentioned around these sorts of applications, for which they usually were terminated at some point.

Table 3

List of AI Tools with Their Purposes, Problems and Opportunities

Purpose	Problems	Opportunities	Tools
Transcribing	Data privacy, protecting sources, text losing emotion of non-verbal cues	Automating a time-consuming task	Good Tape, in-house tools
Translating	The point of text might change in automatic translation	Can help in border areas or reach new audiences in multilingual areas	In-house tools, ChatGPT, and other AI-based translation tools such as DeepL
Headline-making	Sometimes not as good as human	Can help in receiving more reads for the article	In-house tools
Summarizing or changing the format	AI losing the point of the article or hallucinating	Can help in making the content fit in digital platforms' different formats	In-house tools, ChatGPT
Brainstorming	Journalists becoming 'lazier' with topics, can only be creative in the limits of what it has been taught	Can find new viewpoints and be of aid to inspiration	ChatGPT, in-house tools
Tone-defining	n/a	Can help in to recognize if the article uses multiple tones, and can help to modify it for certain audiences	Chat GPT or in-house LLMs

Table 3 continues

Information gathering	AI hallucinations, lack of local information, reliability of information, lack of sources	Can shorten the text or make industry jargon more understandable, a tool to get general knowledge on larger topics	ChatGPT, Perplexity AI, Microsoft Copilot
Data scraping	Data or API availability, reliability of data scraped, journalists need to still understand the data themselves	The possibility of making more data-based articles leaves journalists more time to focus on writing news	In-house tools, using ChatGPT to write code for Python etc., in-house tools
Data analysis	Lack of sufficient data from the local context	The possibility of making more data-based articles leaves journalists more time to focus on writing news	ChatGPT (Premium), R or Python with AI-created code
Visualizing data	n/a	The possibility to make more data-based articles leaves journalists more time to focus on writing news	ChatGPT (Premium)
Spell-check	Curbing the learning process of editors, making language simpler and more similar	Can cut down on work from the editing phase	Built into some text editors, in-house
Writing articles	Editorial or journalistic decision-making, AI hallucinations, lack of traceable sources, other ethical concerns	Can automate writing short articles or announcements on topics such as sports, could be used to write summaries of scraped local data	In-house tools, LLMs

Table 3 continues

Creating images	Journalistic integrity on publishing only existing things, audiences trust in media	Helpful for especially small newsrooms and articles, when suitable pictures are not found; can be used to extend existing images to fit the format	Midjourney, Adobe Firefly & Photoshop
Audio(visual) creation	The models that were tried did not turn out reliable yet	Can be used to make short news briefs on the radio or to make articles more accessible, making videos for social media	Opus Clip (for video creation)

Technological Characteristics

Use Effort and Efficiency

The way journalists understood the ease of use, a predictor from the UTAUT model, did not vary a lot across interviews. The journalists generally understood the AI tools that they had used as easy to learn and work with. This was especially mentioned in the case of ChatGPT which was the main AI tool used by the journalists outside in-house applications. These were also mentioned to be very simple, fitting to the workflow of the journalists. AI applications were also generally easy to use in both languages.

The only problems that journalists saw in using the AI tools were with coming up with prompts. Individual personality factors could affect this, for instance with the formation of the questions: *"Well, I have understood that it is quite simple or then we have not had (..) so well-developed versions (..). But perhaps the fact that when I'm a kind of a wordy speaker, (..) so then it gets a little bit messed up in it. So now it has been kind of learning, that you give but a clear question and not any small talk there."* (Interview 5, FI) Therefore, the ease of use was not a hindering factor in the adoption process. One journalist considered that this

could even be a risk in the long run, in case people start depending on it even though it is just a technology; *"your main tool should be your brain."* (Interview 13, NL)

One of the main reasons for implementing AI in the newsrooms is increasing efficiency. Therefore, this is also discussed as expected in interviews. Especially in terms of AI tools for routine-like tasks, such as transcribing, spell-checking or the technology was well received in terms of its efficiency. However, there seemed to be a risk with newsrooms wanting to automate tasks for which there was no need for more efficiency:

"I think the trend nowadays is that everybody wants to use AI. (..) [In the previous job] I was conducting AI experiments (..) and they wanted to transcribe all their podcasts within seconds and make summaries of it for Spotify. But [making] those summaries (..) you save 30s on one thing and spend thousands of euros on it. (..) So we're trying here to rewind that, starting from the needs and what can we do to make it better and faster and more efficient." (Interview 12, NL)

Suitability of Tools

The study also attempted to consider the suitability of the AI tools for the contexts of the local newsroom and their respective languages, as well as for the tasks of the journalists. The suitability of the tools was seen as an important factor for the adoption of new tools; if the new tools did not fit the needs, and context of the newsroom, they were not seen as necessary. This could mean that the tools did not fit the workflow and habits of the journalists, such as in the case of a journalist who did not record their interviews, and therefore, did not see the need for transcription.

The local journalists saw an important part of their work revolve around knowing their audiences. This meant being aware of the culture in the area, and the knowledge that local people hold on different topics. An editor described it like this: "*You cannot take the*

role of a journalist, because I think there's still, to get good journalists, you need to have feelings, for instance. You have to know the people you work for; you have to know all the insides and outsides of the news that you're covering." (Interviewee 13, NL) Therefore, local journalists have still tasks that cannot be covered with AI, as these rely largely on emotional and contextual skills.

In addition to this, interviewees did not see AI tools to be sufficient in fact-checking tasks, which is a big part of their profession. The reliability of the technology was often questioned, which will be discussed further in the following chapter, but also the journalists saw that in the local context, fact-checking involved more than looking for information online. In some newsrooms, fact-checking and information gathering oftentimes meant calling emergency services, for instance, to get more information about the current emergencies. They did not believe AI technologies could take over this kind of fact-checking task.

Data Concerns and Reliability

Regarding the technology, the interviewees' biggest concerns were copyrights, data privacy, and reliability. For data concerns, copyright issues and data privacy were the main issues mentioned by interviewees. Media organizations of the interviewees were worried about how their content was being used to train AI in a way that breaches their copyrights. Some local media answered these problems by setting up paywalls on their sites as this "*threatens (..) the monetary aspect*" (Interviewee 4, NL) of the newspaper. Data privacy was a worry that individual journalists recognized as an issue. They worried about AI use with sensitive data for instance in cases where protected sources were interviewed. This is information that should not be used to train AI. These issues were a big part of why multiple bigger conglomerates developed or were developing their in-house tools.

Lastly, the reliability of AI tools was questioned in all the interviews. Journalists and editors were visibly aware of the reliability issues with information provided by AI. As most chatbots, such as ChatGPT, do not provide the sources they use, journalists mentioned relying on the information given by AI could easily make one miss *"common journalistic steps"*. Although most trusted themselves to stay aware of the reliability of the information used, it was more worried about what happens when journalists use AI under time pressure or get *"lazy"* in checking the facts. Especially larger adoption of the tools would increase the worries of misinformation, as people's understanding of how AI works and therefore, of its reliability, might vary. The reliability of sources was also considered when in-house data scraping from local sources was discussed.

Environmental Characteristics and Interventions

Digital Transition and Economic Pressure

While new obstacles are brought to local newsrooms by the introduction of new AI technologies, the digital transition that already started some years back is still underway in most newsrooms as well. In digital platforms, the normal formats of articles do not work the same as they did in print. Part of what has paid to the changing focus of news production has been audience analytics applications. When receiving high volumes of feedback from the audience behavior, newsrooms have, to some amount, focused more on catering to that behavior. Journalists mentioned that online audiences rather read shorter articles with visual elements and data. Some newsrooms also pay attention to the topics readers are most interested in, such as news about local infrastructure, and attempt to focus on those in their output. This was mentioned slightly more in the Dutch interviews. The attempts to cater for audience requirements in the digital sphere were usually mentioned in the context of the economic pressure that the newsrooms were experiencing.

Tying to the industry's digital disruption, economic pressure was to an extent seen as a background reason for implementing new technologies. An interviewee described the situation as having a "*broken revenue logic*" (Interviewee 5, FI). This led to the shrinking of many newsrooms in size amongst other effects. While this was the case, most of the journalists still tried to keep themselves separate from creating too market-orientated news for the sake of quality journalism. They also believed that, for instance, AI-written news would be counterproductive for economic gains, as what people are paying for is still quality information.

Data Availability

A local-specific problem with AI tools was the availability of proficient data in good amounts. When attempting to work with tools for data scraping and analysis or thinking about their applicability to their job, some journalists have come across these problems. There were problems with the availability of the data on local decision-making for instance at times, although it is supposed to be available. The context might also at times be too specific to be included in the training material for large language models. A lot of local information is also available in the archives of the local papers, of which most are available only for the subscribers; *"It's not trained on your(..) own stories, and that's what might be interesting to have an own language model which has old stories. All the [organization's] newspapers combined. We [could] use it much better or also for history targets."* (Interviewee 2, NL) It was mentioned that regional-level data was already better. Therefore, the journalists often had to count on their knowledge or the newspapers' archives for local information.

Rules and Regulations

Journalists follow guidelines of ethical journalism in their work. In Finland, these are set by the Council for Mass Media, which was mentioned as one of the main authorities whose ethical guidelines on AI use, that the journalists would also be following. In the

Netherlands, a similar central authority was not mentioned, other than Nederlandse Lokale Publieke Omroepen which provided AI guidelines for the local public broadcasting organizations. However, ethical guidelines were reflected similarly in both countries.

One of the main considerations for the AI guidelines was discussing the transparency on the use of AI, meaning how should the use be disclosed to audiences and when. For newsrooms, this was connected to the trustworthiness of media and news. Journalists agreed upon that whenever something was created completely with AI, it should be mentioned. On the other hand, however, the use of AI in the early stages of the journalistic process was not necessarily disclosed as often. In case the organization had engaged with AI developments, they had usually also created their organization-specific guidelines on AI transparency.

Another prominent discussion point was the editorial or journalistic decision-making power when it comes to AI. It was underlined by the interviewees that at any point, a human should be there deciding what is being published. This was referring also to journalistic ethics, which (in Finland) states that decision-making in editorial choices cannot be given to parties outside the newsroom. While most of the AI guidelines set in place were strict on these ethical concerns, they were still mentioned to be fluid and in flux as the technology keeps developing.

Organizational AI Strategies

AI strategies are something that most local newsrooms are working on at this moment. Therefore, this was also a topic that came up in most of the interviews. The organizational AI strategies usually included ethical and practical guidelines for the use of AI tools, especially in terms of transparency, the need for human supervision, and fact-checking; allowed use cases and tools for AI; as well as possible in-house AI applications. Sometimes the strategies also included ways to involve journalists or editorial teams in the innovation

process. Generally, the managerial levels in the newsrooms were eager to *"simulate"* AI in the organization.

There exists a large variety of editorial tools in the toolsets of bigger media organizations. These could include spell-checks, transcribing tools or simple language editors for instance, and they were usually in use on a regional level rather than in most local newsrooms. The creation of in-house tools was usually motivated by concerns regarding data privacy and copyrights. They allowed the organizations to explore AI use without risking the data, as would be the case on some external applications, such as ChatGPT. However, these tools were usually created by separate engineers or innovation teams, which made their development separate from the actual users. In-house tools seemed to be the main form of organizational AI adoption in Finland.

Many newsrooms without their own AI applications were experimenting with external applications such as ChatGPT-based tools or transcription application Good Tape. In these cases, the organizational strategies usually focused more on defining accepted and prohibited uses of AI. It was then on the journalists to take time and experiment with the AI tools to figure out how to adopt these in their daily work. This was done in one local public broadcasting newsroom:

> *"I think it's mostly going with the flow. So, everybody knows that if they*
>
> *find a new tool (...) They can just come to us, the management, and tell us,*
>
> *OK, this is good. Then we have guidelines for what we use, we follow the*
>
> *NLPO. They made guidelines about ethics, about data storage, et cetera."*
>
> (Interviewee 12, NL)

The newsroom had, however, younger employees than most of the other interviewed newsrooms, which could mean that the journalists and editors are more "tech-savvy" to start with.

Seeing that local journalists are usually part of older generations, amongst which the digital skills are not as native, training is an important part of AI adoption. This was divided into organizational training and external training. Most of the formal training received by the interviewees was organizational, however, this was more of an exception than the rule so far. Most of the trainings were one-time instances where the basic ideas of AI were described and in-house tools or ChatGPT were introduced. One interviewee also mentioned they were able to take a 3-day-long course at a local university supported by their organization to test out the basics. Organizational AI trainings were usually led by an AI expert at larger organizations or individual journalists/editors who had gathered some expertise on the topic on their own. One of these journalists who had led AI workshops at their newsroom mentioned that it was mainly about showing the practicalities of AI use:

> *"I also gave some workshops here at the newspaper to little groups. (..)You*
>
> *have to try it yourself (..) also to know like this computer and how it can*
>
> *help you. Because it's like, [as] dumb as the prompt. (..) If you give like*
>
> *really smart prompt, it will give you a smart answer, if you give a simple*
>
> *prompt, it gives you a simple answer."* (Interviewee 10, NL)

The journalists who did not receive training from their organizations yet relied on their knowledge of external training. In most cases, this meant that they had spent some time playing around with tools or looking into it with family members for instance. Organizations in some instances also provided their employees with training materials that they could use to train themselves. While most of the media organizations pushed for the adoption of AI tools,

there is not a lot of training available, or time allocated so far for this. Multiple journalists mentioned the lack of time to be the main hindering factor for their adoption of AI tools.

Views on Future

Throughout newsrooms and countries, there is an understanding that AI will be part of the (near) future of local journalism. The direction that this will take the field depends on the ways that it will now be used and adopted. Journalists believed they should keep up with the developments in AI to keep their jobs in the future as well. A lot of interviewees did not want to predict the effects or impacts that AI would be having specifically on their jobs. They did however reflect on utopic or dystopic images of the future when discussing different tools and the ethical problems with these.

In the dystopian future, journalists saw that AI would transform their profession, endangering the ethical integrity of journalism. While many did not believe that their jobs specifically were endangered, there were already some applications of AI in radio and TV newsrooms, where this was seen as a bigger risk. Interviewees recognized the general creation of any form of media completely with AI as a risk, not only due to the concerns of job stability but also due to ethical concerns. Slipping from the ethical guidelines with the use of AI was also mentioned to bring other risks for the future. AI is also being feared to pay to this mis- or disinformation concerns in the news media. Its ability to hallucinate things or pull information from unknown sources was seen to be risking the future, in case people's ability to recognize reliable information and know what is AI-written does not follow the development.

Lastly, a worry that was raised was the lack of creativity and humanness of AI-generated text specifically in the Finnish context. In case AI-written articles became more common, journalists were afraid that this would result in more plain language used in general. The current state of AI-generated text was mentioned to be quite *"official"*, especially in the

case of the Finnish language. This worry was not raised in the interviews with Dutch journalists similarly. These dystopian views on the future were somewhat increased by the slow developments in AI-related legislation.

The AI can still also create a future of added value, increased efficiency, and survival of local news. Journalists had a strong trust in the continuing demand for local news, and in the best-case scenario, the implementation of AI could help in fixing the problems brought by digital transition and economic pressure. It could help in reaching new, younger audiences that are not being reached currently. With the help of AI, local newsrooms could also more effectively complete the tasks of a 'watchdog' for local politics by being able to handle data more easily. Journalists saw their profession to be continuing as the creators of new information and as reliable sources of information. They were motivated to keep sticking to the fact-checking of information, and letting AI just speed the process in other stages for them. As the AI tools relied on the information that they had been taught, the journalists mentioned that they were still needed as the ones who would be explaining the society and adding to the existing knowledge of the local people.

Discussion

Finally, the main results will be discussed and connected to the theoretical framework. This will specifically address the research questions posed in the introduction to the study. The findings will then be discussed for their theoretical and practical implications. Additionally, the study will be looked at critically and its limitations will be discussed. Future research will also be considered last, with recommendations for research directions being given.

Main Findings

This study focused on how journalists use AI in the different phases of their work (RQ1) and the factors and characteristics that affect the adoption of the various tools (RQ2).

Practical AI adoption is still in its early stages in most local newsrooms, as also noted by Thäsler-Kordonouri & Barling (2023). The adopted tools for information gathering and analysis are currently mainly tools that automate manual tasks of the process. Most importantly it helped them with interview transcriptions and going through large amounts of documents by summarizing them. For creation and presentation, on the other hand, AI tools were used for editing the text in terms of grammar and suitability for the digital platforms. These findings are in line with the literature on the field predicting that the development of AI in journalism is moving away from 'robot' or 'automated' journalism, and more towards tools that are making the work more efficient (Noain-Sánchez, 2022).

The AI tools are not adopted similarly across newsrooms or individuals. Journalists working more with data or visuals seem to have adopted AI earlier than their colleagues. Also in some newsrooms, young people or tech-savvy colleagues have explored the new tools more extensively. It is possible that journalists with professional specifications, such as data journalists, find advances in AI tools easier than generalist journalists. For example, using AI for data scraping and analysis is more accepted than using AI to create news or gather information.

Referring to the UTAUT model, the facilitating conditions and performance expectancy are central in this context, particularly related to the findings on technological and environmental characteristics, as mentioned in Venkatesh (2022). While journalists prioritize the tools that can perform more efficiently than humans, their organizational context and ethical considerations are even more important for the adoption process. Media organizations are currently working to create strategies for general organizational AI adoption with this in mind.

Ethical considerations were a major topic of discussion in many interviews. Similar to the findings by Kreft et al. (2023) or Noain-Sánchez (2022) for instance, AI tools can change

the field of journalism in multiple directions Local journalists agree that the impacts will be significant, though many are hesitant to speculate on the technological outcomes. Olsen & Hess (2024) also found this, as Norwegian local journalists and editors wanted to distance themselves from the development of new digital tools. While journalists did not extensively discuss the direction where the tools would be developed, they reflected on the utopian and dystopian scenarios based on journalistic ethics. They emphasized the importance of ethical considerations to avoid a dystopian future where journalists are no longer needed. The utopian scenario was still seen as possible as well; a world where local journalism would still add value to the world.

Based on the results of this study, it is interesting to consider the local journalists understanding of what they are needed for in the future. Local data is not as comprehensive usually as regional or national data, as the findings from Stalph et al. (2022) and Thäsler-Kordonouri (2023) suggest, for which local newsrooms see themselves as important local sources of historical and current information. They do not believe that AI will be able to take up tasks of fact-checking work or local government's 'watchdog' tasks, for instance. Journalists also reason their job to be the 'creators of new information', compared to the AI technologies that are working based on what is already known. There is therefore still trust in the survival of local journalism.

Theoretical Implications

This study provides implications for the fields of journalistic innovation and studying AI in journalism. The adoption of AI tools in local newsrooms should be studied in the context of digital disruption. As discussed in the theoretical framework of this study, this has been affecting the media industry for the past decades and to some amount it is still ongoing (Waschková Císarová, 2024). Journalists referred to the digitalization of news as the reason for the adoption of AI in many instances, and therefore, connected these topics in many

instances. AI can be, therefore, analyzed as a way for local media to survive better in the digitalized time that has set new requirements in terms of efficiency and economic success.

There were also implications for the designing of the tools and the process around it. In literature, there has been growing interest in understanding how these new tools can be designed so that they fit the journalists' needs and that the journalists also understand how they work (Cools & Koliska, 2024; Gutierrez Lopez et al., 2022). For local journalism, this is especially important to consider, as the resources of the newsrooms are not in many cases allowing for the same amount of experimentation, for which specifically the in-house tools should have a good efficiency-price ratio. Local journalists' older age brings an element to the development of new AI tools as well, as this suggests that there are differing levels of digital skills in the organization. This study also proved there to be some purposes that local journalists considered AI to be insufficient to perform in their profession. Therefore, local journalism should be considered for its specialties in the study of journalistic AI.

Practical Implications

This study provides a few practical considerations for local journalists and newsrooms on AI use. Firstly, ethical matters should be covered while developing organizational guidelines for AI use. Participants of this study referred to national sets of guidelines they followed. In Finland, Julkisen Sanan Neuvosto (JSN) has published a list of implemented rules for algorithmic-based tools, that come into effect during 2024 (Julkisen Sanan Neuvosto, 2024). The NLPO in the Netherlands has, similarly, released a set of AI guidelines for local public broadcasting in May 2024 (*AI Bij De Lokale Publieke Omroep - NLPO*, 2024). These cover topics such as transparency on the use of AI, editorial autonomy, and reliability issues of the tools. Therefore, journalists should be integrated into innovating new tools and guidelines for their newsrooms.

This is a change that concerns the future of their profession. Although there exists pressure to implement AI tools in organizations, it is not purely a matter of finding the newest tools, but the challenge lies in finding the tools that fit journalists' workflow and journalistic ethics. Currently, as most journalists have not adopted AI tools, and therefore not having a good knowledge on these, they require more training in the topic. This should especially focus on widening their knowledge of the ethical issues, data matters, and the general logic of AI. Currently, this would require journalists' own time, which in the current situation in the field is often very valuable.

Limitations

This study was limited in its sample. While having an almost equal amount of interviewees from both countries, the nature of the national samples differed. The Finnish participants participated in their native language, while the Dutch journalists were contacted and interviewed in English. This might have resulted in a lower participation threshold amongst the Finnish participants. The Dutch sample consisted mainly of journalists with deeper knowledge of the topic or editors of local newsrooms. The Finnish sample included generalist journalists or editors involved in news creation. For this reason, comparisons between these two countries are not reliable. In future studies, it should be considered that contacting journalists with little to no experience with AI use should be done in their native language when possible. In addition, the interviews with journalists cannot provide reliable information about the organizational strategies or plans for implementation, as many of them were not involved with managerial-level work. However, this study attempted to provide insight into the grassroots-level adoption of the technological tools in local newsrooms, which was best studied by conducting interviews with journalists.

Future Research

As the organizational AI strategies are rolling out in most of the local newsrooms right now, it should be of interest in future studies to focus on those. These will most likely vary between the different organizations as well as countries. More specifically it should be studied further what journalistic tasks will be left untouched by new technologies, how the journalists are trained for the change that AI will bring, how the journalistic ethics develop, and how the local journalists will appropriate the new tools. The journalist-technology relationship should be especially investigated this way. The organizational measures should also be studied by the innovation or editorial teams that are currently developing these.

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Conclusion

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This study explored the use of AI in local newsrooms and the factors that affected the adoption of AI tools in this context. A total of 13 interviews were conducted with journalists or editors from Finland and the Netherlands. It was found that while AI adoption is not widespread amongst local journalists, some tools used to help the work have become more widely accepted, such as transcription or headline ideation tools. The factors for the adoption were analyzed based on the Unified Theory of Adoption and Use of Technology (UTAUT) model and its proposed characteristics for AI technologies. Performance expectancy and facilitating conditions are viable predictors for the adoption. Aside from this ethical and data considerations, as well as received training and knowledge were important factors for the journalists on the local level. The main ethical concerns were raised regarding the transparency of AI use, the editorial decision-making autonomy ('keeping a human in the loop'), and the spread of disinformation. However, connected to the current struggles of local journalism, journalists saw AI bring the industry possibilities for survival by making the workflow more efficient and helping journalists with the digital transition. The study suggests that local journalism should be studied individually in the context of AI innovation. This

development should be seen as a continuation of the digital disruption of the industry. Journalists should also be integrated into the development of tools, but to do this they would require organizational training in the technology to understand its practical and ethical facets.

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Appendices

Appendix A: Informed Consent information

Thank you for your interest in taking part in this interview study about Artificial Intelligence tools and local journalism. The goal of this study is to understand how local journalists are (or are not) using AI in their work, the benefits and challenges they encounter, and how this technology is shaping the future of local journalism. For the purpose to compare viewpoints, journalists from local newsrooms in the Netherlands and Finland are interviewed. Previous experience or knowledge specifically about AI is not required to take part in the study.

This document is to inform you about the use and storage of your personal data, the possible risks of this study as well as your rights.

- Your participation in this study is voluntary and you can withdraw from it at any moment without having to give a reason and without there being any negative consequences.

- The topics of the interview might touch on issues such as job uncertainty or personal trauma regarding technology.

- By participating, you give your permission to be anonymously quoted in the publishing of this study.

- Your interview in the context of the project research activities is recorded in audio and video, of which audio will be used for analysis, and the recording will be deleted after transcription.

- Your personal details (name, affiliation, email address etc.) will not be revealed to people outside the research team and they will be destroyed at the end of the study.

- You can ask for any data concerning you to be destroyed and/or removed from the project until it is finalized.

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- Unless you explicitly give your permission, all the information provided by you will be treated as strictly anonymous and confidential, and handled in accordance with applicable EU and national laws.

- The results of this research will be published, and all personal data will be removed, and no information will be identifiable as yours.

- If you would like to receive the results of this study, they can be sent to you via email from your request.

- By giving your consent to this study, you declare that you consent to the abovementioned statements and your decision to participate is made by your own free will.

This information will also be briefed to you at the beginning of the interview, and your consent will be recorded. This recording will be stored in a secure location, separate from the rest of the data, by the researcher.

Separately, you will be also asked for your consent for the anonymized transcript of this interview to be archived in the DANS data repository so it can be used for future research and learning. Consenting to this is optional, and therefore, will not affect your participation in the study.

Researcher: Iida Salonurmi,   Supervisor of the project: Anouk de
                                               Jong,

Student, University of Twente   PhD Candidate, University of Twente

Appendix B: Interview Structure

1. Study Information Briefing and Consent *Record this part separately*

2. Demographical Questions

    1. Gender identity

    2. How old are you? (reporting on age groups 20-35, 36-50, 51-65)

    3. How much experience would you say you have with AI tools in professional sense? (Just in terms of little, somewhat little, somewhat much, much)

    4. Do you work full-time or part-time in a local newspaper or produce news about local topics?

    5. How would you describe the status of local journalism in your country?

    6. How do you feel about AI for journalistic purposes? (*Voluntariness of Use*)

3. Actual Use of AI: **Do you use any AI tools for your job and if yes what?** *"What I mean with AI can be AI tools to aid or do some work for you, such as DeepL for translating, ChatGPT or other generative AI, or for instance classification tools for data analysis."*

    1. Sub-questions for different phases:

        1. gathering

        2. assessing

        3. creating

        4. presenting

    2. (In case they are not used) Do you know of some AI tools that you could use?

4. Facilitating conditions (organizational context)

    1. Does your news organization support or encourage the use of AI somehow?

1. Does your newsroom have a strategy for using AI tools or digital tools in general where AI is mentioned?

2. Are there any AI tools that are generally used in your organization? (if not mentioned before)

3. Do you have any policies for the use of AI in your organization/generally in the national context?

2. Have you had training on AI or the use of it in the journalistic context? If yes from where?

3. Are there some other external conditions that effect how you use or don't use AI tools?

5. Performance expectancy

   1. Do you feel like AI has helped / could help in making the work more efficient?

   2. Do you think AI is helpful in the context of the NL/Finland and locally?

6. Effort expectancy

   1. Do you think the current AI tools are easy to use?

      1. What makes them easy or complicated to use?

7. Social influence

   1. **How do people around you think about AI tools in a local news context?**

   2. Do you see other journalists using different AI tools in their journalistic process?

   3. How do you see industry people around you talk about AI tools?

   4. Do people around you think you should use AI?

8. Technology Characteristics

1. What are some of the main risks you believe there are about introducing AI for journalistic purposes?

9. Views on future

   1. How do you think AI will (or will not) be part of the future in local journalism?

      1. What are the impacts?

Appendix C: Final Codebook

Category	Code	Definition	Examples
Demographics		Asked at the beginning of the interview.	
Age	Age 20-35		
	Age 36-50		
	Age 51+		
Gender	Female		
	Male		
Experience with AI	Little AI Experience		
	Somewhat Little AI Experience		
	Somewhat Much AI Experience		
	Much AI Experience		
Country	The Netherlands		

	Finland		
Views on Future			
	Future Utopia	AI is seen to have a positive effect on the future of local journalism.	"AI will make our work more effective" "AI helps with tackling the problems we are facing right now."
	Future Neutral	AI is seen to have an effect or be part of the future of local journalism.	"Every one of us has to learn to use AI tools at some point."
	Future Dystopia	AI is seen to have a negative effect on the future of local journalism.	"AI will take up our jobs." "AI will make journalists lazier in the future."
Uses of AI on Journalistic Stages			
	Gathering	Using AI to help the journalist in data gathering or to gather (large quantities) of data.	Translating or transcribing tools, data scraping tools, mentions of APIs, using GenAI to find information or summarize documents. Mentions of working with data and AI.
	Assessing	Using AI in the process of fact-checking or assessing the reliability of data or using AI to label it.	Using AI to label data sets or help in checking information.

	Creating	Using AI tools to create or to aid the journalist's writing process.	Using GenAI as aid for writing, as a summarizing tool, robot journalism (AI created articles) or as an inspiration tool. Using grammar check.
	Presenting	Use of AI for presenting the news to the audience.	Includes for instance AB testing of headlines or creation of alternative headlines, using visual AI (pictures, or visualizations of data), using AI for audio(visual) presenting of news.
Research Directions			
Technological Characteristics			
	Suitability of tools	How well the AI tools that the journalist is aware of fits their needs. Quality of answers in the language used.	Lack of creativity of AI generated text, (un-)fittingness for the tasks or the context of the newsroom.
	Reliability	The trustworthiness of the answers given by the AI tools or the reliability of the algorithm.	Mentions of AI hallucinations, trust in the tools, mentions of the unknown nature of the algorithm.
	Data concerns	Mentions of different concerns regarding data privacy or copyright topics.	"We use the in-house tools for the data security reasons."

	Easy to Use	The AI tools are mentioned to be easy to use.	"Yeah, I think using it is very easy."
	Bad Performance Experience	Describing an experience where AI did not work as expected or provided insufficient answers.	"I tried writing an article with ChatGPT but it didn't really work as I wanted, I couldn't really use it."
	Efficiency		AI helps in making the work more efficient. It can help in automating easy tasks.
Individual Characteristics		Matters of personality or digital skills of individuals. Mentions of specific type of journalists that use AI. Mentions of personal professional circumstances that effect adoption.	"Maybe some others don't have so good digital skills, for which they haven't started to use AI tools."
Environmental Characteristics			
	Data Availability	Matters of availability of data to train the AI or to be gathered by the AI. Affects the application of AI tools for the newsroom.	When it is mentioned that there is not enough local data to use for data scraping for instance, or it is insufficient.
	Rules and Regulations	Journalistic or general legal frames or guidelines on the	Transparency on AI use (disclosing instances of use)

		use of AI in journalism.	worries about editorial autonomy, trust in media.
	Organizational AI Strategy	Mentions of already existing organization-wide AI guidelines and/or tools or journalists' expectations of these.	"We have guidelines from the organization on how we should use the AI, and what we cannot use."
	Economic Pressure	Mentions about the economic/market circumstances around the newsroom.	"The cost of news-making raises all the time, and our subscriber base grows older."
	Digital Transition	Shift of the focus to online content in newsrooms.	"We write our stories with the online in mind as that has become the main focus in the past years."
Interventions			
	External Training	Training given by an entity external to the news organization.	"I took a course on AI last year."
	Organizational Training	Training given or made available by the journalist's news organization.	"I received training by our organization." "We have training videos available."
	Lack of Training	Individuals perceived lack of AI interventions by their organization specifically.	"I feel like maybe if I knew better how to write prompts, it would be more effective."

Appendix D: Literature Study Log

Date	Database	Search String	Number of Hits	Relevant Hits	Notes
20th Feb 2024	Scopus	(ai OR "artificial intelligence") AND (journalis* OR news) AND attitude*	104	12	Found good articles to base the first knowledge on
27th Feb 2024	Web of Science	(ai OR "artificial intelligence" OR automation) AND journalis* AND attitude* (also defining publishing year from 2020 on due to the development of AI)	68	14	This led to good results for snowballing
27th Feb 2024	Web of Science	(ai OR "artificial intelligence" OR automation OR "robot journalism") AND (journalis* OR newsroom) AND attitude*	31	12	

27th Feb 2024	n/a	n/a		3	Snowballing from Soto-Sanfiel et al. (2022), relevant and more cited articles
28th Feb 2024	Google	AI and journalism	202 000 000	6 (Multiple other articles skimmed)	A lot of grey literature on the topic, giving guidance for journalists on how to use AI for different purposes
28th Feb 2024	Scopus	(ai OR "artificial intelligence" OR automation OR "robot journalism") AND (journalis* OR newsroom) AND attitude*	45	2	More results about public attitudes
5th Mar 2024	Web of Science	(ai OR "artificial intelligence" OR automation)	39	3	When added adoption, there were no results

Date	Source	Search terms	Results	Selected	Notes
		AND local AND journalis*			
18th Mar 2024	Google	tekoälyn käyttö journalismissa (Finnish search terms for use of AI in journalism)	60 000	3	There were only 2 relevant articles when search especially in terms of local news
18th Mar 2024	n/a	n/a		6	Snowballing from Finnish sources, Especially finding JournalismAI, an LSE initiative on gathering knowledge on the topic, that also gathers surveys every 4 years
18th Mar 2024	Google	Dutch local news media or newspapers	42 700 000	5	Gathering information about the Dutch local news media
27th Mar 2024	Google	ai strategies in newsrooms in the netherlands	11 000 000	10	
12th Apr 2024	Scopus	("local journalis*" OR "local news") AND adoption	19	2	Generally, quite irrelevant but provided 2 very relevant ones from which

					snowballed 7 more relevant sources
26th Apr 2024	Scopus	"news distribution" AND "artificial intelligence"	11	2	
24th June 2024	n/a	n/a	20	4	Snowballing from Opdahl et al. (2023) with Litmaps application