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Examining News Innovation Narratives, Practices and Institutional Logics: A Study on GenAI Adoption in Egyptian Newsrooms

Abstract

AI and algorithms play a crucial role in processes of gathering, filtering, and sharing news. But scholars have focused primarily on the use of such tools in big western media organizations, leaving outlets in developing countries under-researched. This paper aims to redress the balance by examining the use of Generative AI tools in Egyptian newsrooms on three levels: narrative, practice, and technological infrastructure including wider technological and organizational factors that facilitate or hinder innovation adoption. In doing so, the paper employs diffusion of innovation and institutional logics as conceptual frameworks and adopts 28 in-depth interviews with journalists, chief editors, developers, and media experts at four newsrooms in Egypt. Findings demonstrated how news innovation becomes a priority when it not only aligns with the newsroom's external marketing strategy as an early adopter of smart tech, but also when it proves to be financially viable with low tech-related costs, and a potential to increase profitability. Individual journalists are burdened with the responsibility of self-learning about news technology including GenAI tools. This added workload makes them less inclined to alter their daily work routines, leading to more resistance to adopt change or innovation.

Keywords: News Innovations, Narratives, Practices, Infrastructure, Egyptian Newsrooms

Introduction

Developments in AI have transformed the way that newsrooms can produce content. AI and algorithms play an increasingly crucial role in the processes of gathering, filtering, composing and sharing news, allowing media outlets to serve various purposes such as “engaging underserved audiences, selling subscriptions, and recombining and re-using content” (Thurman et al., 2019, p.980). AI is “a branch of computer science focused on simulating human intelligence, one that recently has been especially engaged in the subfield of machine learning: the training of a machine to learn from data, recognize patterns, and make subsequent judgments, with little to no human intervention” (Lewis, 2019, p. 673). This suggests a critical change in the power dynamics of news production where algorithms have a transformative role and autonomous power in the newsgathering and distribution stages, while human news workers exert control over the news selection and editing processes (Wu et al., 2018). In so doing, machines can be perceived as “co-creators of news, alongside humans in the automated newsroom” (Wu et al., p.1452) despite their lack of ability to engage in interpersonal interactions with journalists (Lewis et al., 2019).

Nowhere is this conversation around AI more pertinent than in the Arab region, and in particular in Egypt, the subject of this paper, where the situation has been described by a newspaper editor as a ‘chaotic circus’ (Elgatrifi, 2023). AI tools are already used in some Arabic world media houses to help with tasks such as news gathering, production and distribution. However, scholars have recently pointed out the impact of the economic divide within the Arab region between countries with strong and weak economies on the wider adoption of AI in newsrooms (authors, 2024). Newsrooms in strong economies like the Gulf region (e.g., United Arab Emirates, Saudi Arabia, Qatar, and Kuwait) have started experimenting with AI technologies including AI-generated news anchors and Chatbots years ago, even before ChatGPT was introduced. For example, Astra Tech, a consumer technology company based in the United Arab Emirates, has developed the so-called first ‘Arabic ChatGPT’ through its BOTIM video chat app (Birch, 2023). Meanwhile Al Jazeera Arabic introduced AI tools to tackle ‘fake news’ (Al-Gody, 2021) as well as an AI news anchor (authors, 2024). The UAE-based news agency Al-Ain has used AI in script-to-voice formats and also developed a robot writer to produce a weekly AI-generated article - although not without controversy after the use of outdated data (Al Shurafa, 2023).

To the contrary, local journalists in developing countries with struggling economies including Egypt, Lebanon, and Tunisia still encounter limitations related to lack of financial resources, digital infrastructure, data access, digital skills, and technology training which highly restrict their ability to use advanced digital tools to personalize news content and reinforce audience engagement. This raises many questions about how medium and small-sized newsrooms in these countries tend to perceive implement GenAI tools and what factors might facilitate or hinder this innovation adoption.

Therefore, this paper draws upon the diffusion of innovation and institutional logics as theoretical frameworks and employs 28 in-depth interviews to map out the news innovation scene in Egypt, as one of the major players in the Middle Eastern media sector with a longstanding history of being a pioneer in adopting communication technologies in the Arab region (Badr, 2021). It examines the use of AI-driven tools on three levels: narrative, practice, and technological infrastructure. On the narrative level, the paper first investigates how Egyptian news actors (journalists, news managers, and tech developers) working for three selected newsrooms understand and define the role of news AI in the media landscape in their country in general plus their outlets in particular. Looking at practice, the paper examines the news workers' use of AI-driven tools in different phases of news production processes (e.g., from the use of the AI-powered Google Trends to find a story, to the use of recommender systems and conversational newsbots to personalize the distributed news content). The paper further explores how the news actors' competing institutional logics can shape the deployment of these innovative technologies. On the wider infrastructure level, the paper further investigates the wider technological and organizational factors that facilitate or hinder the adoption of AI tools in the selected newsrooms.

Conceptualizing News Innovation and AI Technologies

The concept of innovation has been defined in academic literature (Bleyen et al., 2014) as it encompasses different ideas such as better ways of doing work (ie process) or deploying innovative methods for profit purposes such as gaining a larger audience. Although it implies change, it should not be “equated to change itself, because it is based on complex dynamic social processes that go beyond the control of single actors in diverse media contexts” (García-Avilés,

2021, p. 3). Digital innovations can be both dramatically experimental or a long-term normalization of technologies (Belair-Gagnon & Steinke, 2020). Further, news innovation does not necessarily refer to something completely new, but they can rather be a “new combination of already existing ideas, competences and resources” (Storsul & Krumsvik, 2013, p.14). Generative AI (GenAI) tools such as ChatGPT, Bard, DALL-E, and Stable Diffusion offer a recent innovation with novel capabilities to generate new content including text, images, videos, and music in response to a prompt (Cools & Diakopoulos, 2024). It uses Large Language Models (LLMs) to “learn the underlying patterns of a given dataset and then generates new data points” (Beckett, 2024).

Developments in artificial intelligence technologies have driven its use in allowing journalists to automate news production tasks – such as verifying data, producing graphics or writing basic news stories (Gutierrez Lopez et al., 2023). Added to this, is the increasing use of agents capable of ‘conversation’ – such as Alexa, or social robots like Jibo and social bots. Thus, theorists argue both the process and labour of communication can be automated (Lewis et al., 2019). Specifically, when AI is used in the communication industries, such agents as mentioned above are designed to function as communicators themselves rather than mediators of human communication (Guzman & Lewis, 2019). So, for many newsroom executives and journalists in the Global North, the use of AI has been seen as positive – speeding up mundane procedures and freeing journalists from repetitive, boring tasks in order to focus on more creative, in-depth journalism work (Schapals & Porlezza, 2020). However, there has been significant cultural resistance too (Beckett, 2019; Thurman et al., 2017) with journalists feeling that their privileged roles are under threat, and AI can be used to dispense with human reporters altogether.

However, theorists argue to work effectively, AI needs human agency (Marconi, 2017; Diakopolous, 2019). There is clearly a need to understand more clearly how journalists and AI interact to fully understand the concerns around autonomy and agency that this new technology is raising (Cohen, 2018). Any new technical development in journalism is commonly greeted with over-enthusiastic predictions, but even for those who see the positive in AI’s incorporation into journalistic labour, there are still underlying problems, specifically for the Global South. Any technological system will necessarily reflect both the conscious and unconscious bias of its maker

(Broussard, 2019). This proves problematic because of the under-representation of marginalised communities in this area (West et al, 2019) and as such there is also bias towards minority groups (Johnson 2021). For example, while there has been much discussion around privacy concerns, these are often seen from a Global North (and individualistic) standpoint, whereas parts of East Asia and Africa have a much more collective sense (Namara et al., 2018; Yuki, 2003). Thus solutions to Western' privacy concerns may not be suitable for other parts of the world (Abebe, 2019).

News Innovation and AI Adoption in the Global South

There has been an exponential growth in internet usage in most countries in the Global South (Gondwe, 2023), although some scholars argue that this is another form of colonisation in which huge corporations collect and sell raw data created by these countries (Couldry & Meijas, 2020). However, because of the current lack of studies on journalism, and the way it is practiced outside the Global North, we do not yet have a full understanding of how technological changes and advances are affecting journalism practice (Goyanes et al., 2021). This is particularly true of AI in newsrooms, where there have been limited studies outside the work of Okiyi and Nsude (2019), Udoh, Nsude and Oyeleke (2022), Jamil (2020), and Gondwe (2023) in which scholars looked at Nigeria, Pakistan, and sub-Saharan Africa respectively. Instead, Global North perspectives have been upheld without taking into account the particular challenges Global South journalists may encounter such as authoritarianism, populism, unequal access to technology, repressive media laws and self-censorship (Mutsvairo, 2019).

For example, studies show that in Nigeria while 76 per cent of journalists were keen to be trained in AI, nearly half of these feared it could lead to unemployment with one in five thinking it could only be operated by experts (Udoh et al., 2022). This built on an early conceptual exploration of the issues there with lack of training and limited knowledge about AI as barriers for such newsrooms to adopt these tools (Okiyi & Nsude 2019, p. 158). Meanwhile major obstacles to adoption of AI in Pakistani newsrooms are down to lack of resources, access to data and its accuracy, no government strategy to foster AI in journalism, a lack of education/training for journalists and the existing digital divide (Jamil, 2020, p.14). Also, a few studies focused on the

adoption of AI technologies in Egyptian newsrooms identifying the limited AI literacy among managers and as well as the lack of readiness and motivation of journalists to invest in upgrading their AI-related skills as main challenges hindering AI deployment (Elaasser et al., 2024). Mansour (2021) argued that enhancing journalistic efficiency, increasing profits for press institutions, and achieving a competitive edge are the main current motives for integrating AI in Egyptian newsrooms (p.1398).

Yet the opportunities that AI tools offer Global South journalists should be part of any discussion about the algorithmic bias and technological challenges (Kothari & Cruikshank, 2022). Practical issues also hinder use of AI in the Global South, such as scarcity of skilled professionals (ICFJ, 2017), There lack of data sets for many Global South languages which limit the way algorithms work (Fu, 2022), and the issue of many Global South journalists ‘moonlighting’ while performing other jobs (Gondwe, 2023). There is also the cost –a major investigation using high-impact computational journalism can cost more than \$1m just for the journalistic labour, never mind the other costs needed (Hamilton, 2016).

Mapping AI Adoption in Egyptian Newsrooms

The Covid-19 pandemic has accelerated the digitization of editorial content management systems, the increasing use of data journalism, and the unprecedented adoption of news automation and artificial intelligence tools in some Egyptian newsrooms (authors, 2023). Cairo 24 was the first Egyptian newsroom to experiment with news automation and creating a news bulletin using an AI-generated news anchor (ibid, 2023). Additionally, Al-Masry Al-Youm newspaper was the first to launch an AI-Powered Semantic Search service in December 2024, following a five-month collaboration with the Google News and Financial Times initiatives. Aiming to enhance reader engagement and interaction, the service was powered by an interactive chatbot that uses Natural Language Processing (NLP) to understand users' inquiries and provide automated responses based on an extensive research in the newspaper's website and digital archives (Elgatrifi, 2024). In the wake of the increasing AI use, ONA Group for Media Services that owns Masrawy news website, also launched the first Egyptian Data Journalism unit to teach journalists how to scrape and analyse data. Due to the recent change of managerial logics, the unit was then closed, and re-located by its

founder, journalist Maha Salah El-Din, to Al-Masry al-Youm newspaper in 2024. However, these pioneer technological advancements are still considered individual experiences that cannot be generalized across Egyptian newsrooms.

On a broader scale, journalists in Egypt have started experimenting not only with large language modules, but also grammar-checking tools for Arabic such as Lisan and Saheh, and fact-checking tools such as Tahaqaq, although this is usually by individual journalists wanting to improve their skills, rather than attending courses organised formally by their newsrooms (authors, 2024). Some Egyptian news websites have started to use AI tools to edit text, photos, and videos, translate news, and analyse data (Al-Qadi, 2024), while some use AI chatbots to interact with their readers and tailor their content accordingly (Hassan, 2023). Meanwhile there are problems in this region in using the fast-growing and probably best known generative AI chatbot, ChatGPT, which is now used extensively by global North media professionals (Pavlik, 2023). ChatGPT attracted one million users in the first week, and had reached 100 million users within two months (Hu, 2023). However, Egyptian journalists face risks in utilising this tool though. Like other governments in the MENA region, such as Syria, Yemen, Bahrain and Libya, Egypt's powerholders have decided they will not allow access to ChatGPT at the beginning performing a "form of indirect or soft censorship within existing legal frameworks" (AlAshry & Al-Saqaf, 2024, p.1) citing fears around national security or protecting their domestic companies from foreign competitors as reasons for doing so (Abdel Razek, 2022) or even the replacement of human labour with fewer social interactions (Alzahrani, 2022)

However, journalists in Egypt do still use ChatGPT for fact-checking, research and generating news article (AlAshry & AlSafaq 2024). They can circumvent the above restrictions by using Virtual Private Network (VPN) services, but they risk serious legal consequences if they are caught doing so and this censorship has a bad effect on journalists with many reporting feeling isolated or doubting the career choices they made (AlAshry & AlSafaq, 2024). Yet there are still challenges around using such tools on a practical level – for example there remain problems around nuances in language and cultural context, as well as underlying bias. These restrictions on the access of available AI tools highlight the need for examining the current use of AI-driven tools by Egyptian journalists on three levels: narrative, practice, and technological infrastructure, and

investigating the wider technological and organizational factors, including the newsroom's conflicting institutional logics, that facilitate or hinder the adoption of these innovations. Hence:

RQ1: In terms of practice, what are the main AI-driven tools used by news workers in the four selected newsrooms during the processes of news gathering, selection, writing, editing, and distribution?

RQ2: How do different news actors (journalists, news managers, and tech developers) perceive the role of AI technologies and their different applications in Egyptian newsrooms?

RQ3: What technological and organizational factors, including digital infrastructure and institutional logics, do Egyptian news workers perceive to facilitate and/or hinder the application of AI technologies in their newsrooms?

Theoretical Frameworks

As noted above, the widespread use of ChatGPT and other AI tools happened extremely rapidly in the global north, with many sectors, including journalism, trying to implement these tools that seemed to offer both time and money saving opportunities; the problems that the global south has faced is clear as well. To understand why this has become such a topical part of discussion around journalism development in Egypt, and to fully comprehend the significance of the challenges faced, we have analysed this in the light of two theoretical frameworks: diffusion of innovation and institutional logics. The first looks at why some new practices and tools are more likely to be adopted than others and the challenges around getting journalists to embrace them, while the second leads on from this, allowing us to examine the particular set-ups of Egyptian news organisations and how that has helped or hindered innovation around AI.

a. Diffusion of Innovation

Diffusion of innovation (DOI) theory aims to explain the process by which innovations are communicated through different channels and among members of a social system (Rogers, 2003, p. 5). It looks at what factors may advance or obstruct the disseminations of these new ideas (Santos, 2023), and also the levels of uncertainty that these innovations cause (García-Avilés, 2020). Rapid adoption of new ideas or tools usually comes down to the following five questions:

does this offer an obvious advantage; is it compatible with what the organisation [in this case the newsroom] already does; will it be complex to understand or use; would it be easy to do a trial of this new process or tool; and how easy is it for those involved to see that there has been actual change take place through the innovation used (Rogers, 2003; Ekdale et al., 2015).

As a result, DOI has been used to examine how mass channels as well as interpersonal contacts may influence opinion and judgment (Okon et al., 2020). Other elements may be management support (or lack of) or structural factors (Holman & Perreault, 2023). This has been seen in developments in media convergence (Singer, 2004) or the spread of data journalism (García-Avilés et al., 2019) and now can also be applied to AI adoption in newsrooms.

Von Nordheim et al. (2018) identified three aspects of newsrooms innovation: technological (e.g. multimedia storytelling, a digital-first publishing strategy, use of social media tools), relational (e.g., changing relationships with the media audience by granting them increased influence in gatekeeping and shaping coverage), and cultural innovation (e.g., transformative changes in organizational culture and practices). However, technological innovation usually occurs faster than the two other innovations in newsrooms because most journalists understand the need to use new tools. Yet, they tend to approach technological change conservatively, integrating new tools into existing practices rather than allowing new technologies to reshape newswork (Ekdale et al., 2015; Reich, 2013). Therefore, part of the challenge for managers is that their workers tend to resist changes that they feel disrupt their autonomy or are at odds with accepted journalistic norms and values (or indeed are communicated ineffectively by managers) (Ekdale et al., 2015).

For example, much of journalistic resistance around the use of AI has been due to fears that this can be used as an economic way of reducing jobs by automating certain tasks, or challenges the value and status of journalists' own skills in writing or producing video content by outsourcing this to an AI tool. Contrary to this, it may be younger workers in the newsroom who understand and use these tools more than senior managers which may make those in a position of power more uncertain about this innovation. Employing this theory in our study will allow for identifying the different actors involved in the AI adoption processes and enable such actors to explain their perceptions of the internal and external sources of influence that shape their technological, cultural, and relational innovation adoption in Egyptian newsrooms.

b. Institutional Logics

Identifying these actors also brings us to consider the different pressures, challenges and logics that they will bring when considering their enthusiasm or otherwise for integrating AI tools into their organisations. Institutional logics refer to “socially constructed, normative guides for the interpretation, identity and behaviour of actors within a certain institutional domain” (Lischka, 2020, p. 114). They refer to a “contingent set of rules, premiums and sanctions” that agents “create and recreate in such a way that their behavior and accompanying perspective are to some extent regularized and predictable” (Jackall, 1988, p. 112). Thereby, they vary depending on the dominant institutional domain an actor is situated in and are reflected in her or his practices and vocabularies’.

Even before we consider the current focus on AI and data, there have been competing logics within journalism. What is its purpose? Is it to make money for its owners – thus basically producing a commodity? Or is its democratic function? As such, while those in managerial positions in news organisations keep a firm eye on the revenue, journalists themselves often focus on their watchdog role (Norris, 2014) as representing a ‘fourth estate’ (Deuze, 2005). Such conflict may also manifest itself in the past by the ‘Chinese wall’ between advertising and editorial to keep away monetary influence (Lauerer, 2019) – although, the growth of sponsored content and advertorial challenges this (Ferrer Conill et al., 2021; Beckert, 2023). There is also the issue of audience engagement and orientation which, in a digital world is much easier to track and affects the journalistic logic of story focus (Nelson, 2021; Broersma, 2019; Bruns, 2016).

Lischka (2020, pp.116-17) categorises four main competing institutional logics in journalism: professional, market, managerial and tech logics. The professional range both from how journalists define themselves – are they objective reporters or activists? – but also by their innate sense of creating a product (in this case, a piece of journalism) that is of high enough standard to be sold to a customer (in this case the viewer, reader etc). There is an obvious overlap with market logics here as well – with the need to generate enough revenue, although there is obvious potential conflict as well. Managerial logic considers how easily organisations can adapt to change – which is of particular relevance with the fast-moving technological advances, because tech logics may not always follow the same focus as professional ones. For example, while traditional journalism has focused on the social impact of a story, algorithms will direct readers to

stories that are targeted closely to them personally. The result is of an industry that is attempting to negotiate these different logics.

Research Methods

The paper adopts 28 in-depth interviews with 10 journalists, 6 news managers (e.g., chief editors and managing editors), and 10 tech developers and programmers working for four selected Egyptian newsrooms. In addition, two media technology experts including a leading data journalist specialist in the American University in Cairo, and the head of strategic planning and media manager of the Artificial Intelligence Journalism for Research and Forecasting (AIJRF) were interviewed for further independent and critical insights. The sample consists of 12 females and 16 males, with ages ranging from 29 to 66 years old. The interviews were conducted by the first author between July to September 2023 and lasted for 45 min on average. Three follow-up interviews were conducted in June 2024 to capture recent changes.

The selected Egyptian newsrooms are: a) Masrawy (private Arabic-language digital native news site with 9,214,442 million Facebook followers), b) Al-Watan (private Arabic-language newspaper with online and print versions and about 20 million Facebook followers), c) Al-Masry Al-Youm (privately-owned newspaper with 18 million Facebook followers), and d) Cairo 24 (private Arabic-language digital native news site with 6,145,296 million Facebook followers). Due to the lack of official reports or statistics indicating the exact online traffic and circulation rates of Egyptian newspapers and news sites, the number of Facebook followers offers a valuable indicator of the outlet's reach, audience size, and extent of influence since Facebook is the most-widely used social media platform in Egypt (Galal, 2024) with more than 45.40 million users in Egypt according to latest records (Kemp, 2024).

These newsrooms were selected for comparison based on the following criteria: a) *business model*: Only newsrooms that generate their primary revenue from producing content for their website and social media platforms are selected for analysis, b) *ownership*: only privately-owned newspapers are selected for analysis. Public-service news outlets depending on governmental or tax funding are eliminated from the study, and c) *traffic and search metrics*: despite the lack of official data, the four selected news outlets consistently rank among the top five news websites in Egypt in various non-official reports published by independent sources

(AkhbarMeter, 2024; SimilarWeb, 2024). These criteria give functional equivalence for this comparative project. All interviews were conducted in Arabic based on participants' request and then were translated into English for analysis. Since many participants asked for their names to be taken out of the study, we decided to anonymize journalists' names, only referring to them with a number (journalist 1, 2,..etc) and their job title.

Participants were asked questions about: a) background information about their journalistic career, b) their definition of news automation and perceptions of the role of algorithms and AI adoption in the different processes of news production, c) the various AI-driven tools they use in their daily news routine, and d) the various facilitators and challenges of implementing AI tools in their newsrooms. Thematic analysis was conducted with the help of Nvivo Pro Software. Analysis followed Webb's thematic analysis guidelines (2017) which first involves open coding to identify the recurrent themes in the interview transcript data. The second analysis step involved grouping codes into categories and creating novel connections among them using axial coding to develop theoretical expansions.

Research Findings

AI-related Narratives, Practices, and Digital Infrastructure

To address *RQ1* regarding the use of AI tools in news production **practices**, participants reported using various GenAI tools for three main purposes: a) enhancing their story selection and idea generation using Chatbots especially ChatGPT and Gemini for brainstorming and rephrasing headlines, b) transcribing interviews using speech to text AI-transcription tools such as Otter.AI, and c) using AI-art generation tools to enhance visual production, especially for data visualization and generating graphs, charts, and infographics using online tools such as Graphy.AI, Flourish, and Datawrapper. No participants in the sample reported using AI tools for fact checking or data verification, perceiving it as an advanced task that requires prior technical training. In particular, many journalists reported using Google news initiative tools that are partially powered by AI especially Google Analytics 4 to track their news website metrics including audience's traffic, engagement, and search performance as well as Google Trends to identify trending news topics based on popularity and search frequency. For example, *Journalist 3* from Masrawy noted the increasing use of AI technology in the newsroom:

There has been a huge boom in using AI tools in our newsroom during the past six months. One can use AI tools to generate pictures about an accident to avoid using repetitive traditional archived pictures. Masrawy has offered a data journalism training course, so everyone started searching for AI tools to help them in it. We were also enrolled in another workshop in the National Training Academy, and there were two sessions about the use of AI in news. Some colleagues have subscribed to chatGPT-4 for monthly fees to get speedy answers with higher accuracy.

However, many participants reported practical concerns about the limitations of using GenAI tools to produce Arabic journalistic content. In particular, some argued that AI and machine learning have not reached the required level of accuracy in understanding all colloquial Egyptian Arabic phrases, expressions, and common insults and thus cannot be used to generate (publishable) news. As the managing editor and head of technology development at *Cairo 24* explained:

I wouldn't recommend using GenAI tools such as ChatGPT in newswriting yet because Egyptian audiences are different. AI still lacks creativity in generating Arabic content. For instance, if the government ordered hotels to take responsibility for lost items of guests, a chatbot would generate a boring headline as follows: 'Government obliges hotels to hold responsibility for guests' lost belongings'. Such headline won't be read, published, or even tweeted by our audience as it's not creative, whereas a human-written headline like: 'New announcement from government about guests' belongings: Hotels are fully responsible' might go viral.

Apart from GenAI technologies, many participants explained experimenting recently with various (relational) news innovations that would enhance their relationship with target audiences. While journalists at Al-Watan reported experimenting with some algorithmic news recommendation features on their website and establishing a novel Metaverse studio online to offer an immersive experience for their news consumers, Masrawy journalists reported experimenting with news games aiming to educate players about current events within an engaging setting and creating interactive transmedia (cross-media) stories that involve analyzing large datasets using programming languages such as Python. Cairo 24 was the first newsroom to use predefined templates or structured data to automate short news stories in an initiative to

integrate AI tools (authors, 2024). It is an early stage of automation intended for accelerating news production and distribution to target audience. As *Developer 4*, the head of automation team at *Cairo 24* explained:

We haven't finished the automation process yet. We have only completed phase 1. We used Python to create tools capable of producing automated news. The idea is that if any governmental resources, such as the President, Council of Ministers, or Military Spokesperson, tweet, the model would automatically generate news from those tweets. We trained algorithms to check all the accounts we have entered as resources, extract all data related to the tweets, place it in the pre-defined structure, and create short news stories accordingly.

Furthermore, experts in our sample reported a great potential in employing AI tools for categorizing and organizing the huge archives owned by Egyptian newsrooms, especially state-owned ones such as Al-Ahram and Akhbar, whose archives that date back to more than a century can offer subscriptions and generate extra revenues for newsrooms.

To answer RQ2 regarding the **narratives** surrounding AI role perceptions by different news actors, our findings demonstrated that many Egyptian journalists strongly believe in AI's potential in improving their daily newswork. Particularly, journalists from Cairo 24 and Al-Masry Al-Youm, the two newsrooms that identify themselves as early-adopters of AI technologies due to their pioneer experiments with news automation and developing an interactive chatbot, were more enthusiastic and positive about the potential of using AI in journalism, despite lacking the basic knowledge of how the technology was developed and how it actually works.

Generally, the distinction between technical terms such as AI, automation, and machine learning was vague for many of journalists across different newsrooms. Many reported lacking knowledge about how AI systems work and how algorithms are being trained. This chimes with findings from previous research where a lack of comprehensive understanding of AI potential applications among journalists was reported (Elaaser et al., 2023, p. 78). As *Journalist 3* from Masrawy reported, when the hype around GenAI has globally started following the introduction of ChatGPT, the lack of technical knowledge and AI training offered by newsrooms have caused fear, resistance, and misconceptions among many Egyptian journalists. While some news managers,

including *Manager 3* the editorial manager of Al-Watan, reported hosting Google representatives and Facebook specialists before to offer training to employees in their newsrooms, maintaining the sustainability of such training remains challenging. Due to the lack of professional training offered to journalists on AI use, many reported relying on self-study methods through online courses, or informal peer learning in their leisure time, which increases their workload.

However, no matter how far AI and other technological developments progress, most of journalists, news managers, and developers in our sample agreed that the role of news reporters will remain irreplaceable. To this end, AI was perceived by them as only a tiny helper and not a game changer in the journalistic professional culture. As *Developer 4* from *Cairo 24* explained:

Even in the era of AI and extensive technological developments, there is no substitute for a journalist; they will remain irreplaceable for the foreseeable future.

AI can only alter news, but only a journalist can obtain it.

Nevertheless, many participants expected the importance of the role of developers and programmers to increase in newsrooms in the near future. For example, *Developer 3* from the Al-Watan news website, argued how the role and duties of a programmer will expand in future because more newsrooms will rely heavily on AI and content automation whereas the number of journalists “will undoubtedly fall as the content is the easiest thing to automate”. In his opinion, developers will be irreplaceable as newsrooms will always need a developer to maintain the automated AI-systems and operations.

Addressing the first part of *RQ3* about the **digital infrastructure** in newsrooms, various challenges were further reported by our participants including the lack of high-speed internet connection which is needed for AI operations and cloud computing, the lack of access to big datasets needed for machine learning and training models, especially governmental and official data reports and statistics, and the lack of financial resources dedicated to technology development which hinders many newsrooms to buy subscriptions of advanced online AI tools to support their journalists and developers. According to *Developer 5* in Al-Watan:

These infrastructure-related hurdles have led to the scarcity of Egyptian media institutions conducting experiments to develop new customized AI solutions despite having good human technical team or expertise.

Competing Institutional Logics in AI Adoption

Our data analysis further answered *RQ3* showing how the competing co-existing technological, professional, managerial, and market logics might delay or hinder AI adoption inside the newsroom.

First: Managerial (business-centric) approaches/concerns:

Findings demonstrated how news managers expressed having ambitious technology development plans for their newsrooms. However, these plans were not necessarily well-communicated or explained to journalists who had different professional logics. For example, in *Cairo 24* newsroom that has a pioneer news automation initiative, only journalists and developers directly involved in the news automation project were able to explain shortcomings and benefits. However, other journalists in the newsroom struggled to comprehend the project's functionality and processes. According to the managing editor of *Al-Watan*, even managers need proper training on how to best deploy AI technologies to foster their informed decision-making and effective leadership in newsrooms:

There is a lack of understanding of the distinction between AI and social media technologies. Personally, I'm still unsure how to deploy news automation in Egypt; we still need a lot of training to properly automate news without human involvement. We are not yet ready for such a significant shift. We can rely on AI as an assisting and supporting tool, but not more; this is a far-fetched step.

Also, most of news managers in our sample further reported how the lack of financial resources led to less tendency to engage in long-term investment in news tech, such as hiring in-house developers or investing in innovation labs. Since the four news outlets under study rely primarily on advertising and social media revenues as a business model with no external funders or sponsors, all news managers reported prioritizing audience engagement, revenue optimization, speed and accuracy of publication focusing on business-centric logics. To this end, *Manager 1* the managing editor, at

Cairo 24 explained:

We already plan to use AI tools only if they are beneficial for journalists, not for the sake of showing off or being trendy or even presenting fake scoops. As long as they are better tools, available and accessible, and can ease work on our journalists to always go further, be ahead of their fellows, and publish news with 100% accuracy and transparency.

However, *Industry Expert 1* criticised the mindset of many news managers in Egypt for ignoring the potential of technology investment:

The dilemma is that some Egyptian institutions think that employing tens of people is better than developing technology as they think it's less expensive. In any developing country like Egypt, the human element is considered as the cheapest thing ever.

In her opinion, *Expert 2* explains how managerial willingness to innovate has driven some newsrooms in the Gulf region to take more advanced steps compared to Egyptian media outlets, especially in KSA and Emirates. For example, Al Arabia has an AI lab and Tamara robot news anchor and Al Jazeera, and Skynews used hologram technologies, and the Emirtati Al Bayan and Etihad that publish fully automated articles using AI.

Second: Professional (journalistic) Logics

Unlike managerial logics that prioritize revenue sustainability and audience engagement, and technical logics that prioritize innovation and workflow fluency, journalistic logics prioritize content accuracy, editorial integrity, and journalism ethics. Therefore, many journalists who expressed belief in AI's potential have also reported many concerns about its impact on journalism, especially in an oppressive media environment characterized by the widespread of misinformation. As *Manager 3*, the managing editor of *Al-Watan* explained:

We can't compare AI to the human journalist's intelligence, aptitude, style of thinking, and eloquence. In the end, it's just a computer. It can only deliver us news, but it cannot write it professionally without errors. The human actor is capable of perceiving and recognizing the ethics of journalism, such as subjectivity, neutrality,

accuracy, protecting privacy, and avoiding plagiarism especially in a restrictive media system characterized by misinformation and fake news

Since most of popular AI models were created and dominated by Western tech giants such as Meta, Microsoft, Open AI, and others, participants reported various concerns regarding bias and manipulation in training data that were fed into AI learning systems and the many historical, political, cultural, and religious mistakes they might include. As *Industry Expert 1* explained:

In non-Western countries, we cannot simply ask GenAI tools to generate news about controversial topics related to wars or disputes like: ‘What happened in the 6th of October war, 1973?’ as we don’t know what exactly they have learned about this war. Similarly, we can’t ask them about religion or countries’ relations because we have no idea about what they have been fed. The resources will never be announced. Counting on ChatGPT as a credible resource is like counting on Wikipedia as a credible resource! Wikipedia depends on people’s edits and documentation, and ChatGPT depends on unknown resources. Algorithms are already biased and will never be neutral.

Furthermore, a journalist explained how the establishment of the first Egyptian data journalism unit gives a demonstrative example for how conflicting managerial & professional logics have significant influence on the pace and scale of technological innovation adoption in newsrooms. *Journalist 2*, the founder and former head of Data Journalism Unit in *Masrawy* outlet explained how her willingness to develop a data journalism project was received with resistance from the management at the beginning:

When institutional management is offered a good idea, they take too much time to consider it. This data journalism unit took me two years in order to work it out. For two years, I’ve been presenting this project to the administration, and for two years the administration rejected it. Until I decided to submit my resignation. So, when I did that, they approved the project. I was not going to do it really, it was devastating.

To appeal to managerial logics and overcome financial and data-related challenges, the founder of the data journalism unit, *Journalist 2*, further explained how her innovation adoption strategy involved three main goals to promote her innovative unit as a source for generating revenue and

traffic to the newsroom. First, it focused on capacity building by offering a six-month training program for fellow journalists on how to scrape and analyze large datasets. The second goal involved launching the first databank for journalists to overcome data access and transparency problems in Egypt aiming to make it a paid service for other media organizations to use. The third was producing interactive data-driven news section on the website to enhance news engagement. However, the data journalism project was influenced by a change in management, particularly the departure of the supportive executive editor, leading to its discontinuation and relocation to Al-Masry Al-Youm news organization:

Our newsrooms' business models depending on ads and social media revenues come with a pressure as experimenting with news innovation requires time, money, and manpower posing an extra burden on the newsroom that prioritizes journalists' commitment to producing timely content and achieving their news production target first. So experimenting with data journalism was perceived as additional load or waste of time

Third: Technical Logics

Developers in our sample reported prioritizing technical logics that involve enhancing the news workflow and upgrading the content management systems (CMS), audience analytics, and algorithmic decision-making tools by creating custom software tools and applications to adapt to the technological advancements and changing audience behavior. Since there are no innovation labs in Egyptian newsrooms, developers rather reported serving as problem solvers or tech service providers who are usually contacted by news managers and editors to perform a specific task, while not being given free space for innovation, experimentation, and creation. *Developer 8*, the head of cross-media team at Masrawy, explained how the role of programmers goes beyond designing the news website and upgrading its interactive features to develop user's experience and interface, as it involves offering programming solutions, developing algorithms, and fostering interaction with other services. However, he further argues:

The general problem that exists not only in Egypt, but also throughout the Middle East is that media businesses are constantly in a hurry; they do not allow others to develop anything; they do not accept any fresh creative ideas but only stick to

traditional and existing ones.

In general, developers strongly believe that AI and journalism should go hand in hand to create a more efficient and creative industry. As *Developer 1* from *Cairo 24* further explained:

The journalist who will not adapt to AI technology and will not improve his/her skills will come to a standstill and will barely produce; compared to the one who does the opposite. Both AI and the role of journalists are interrelated and integrated, either is never enough, rather, backward and deteriorated.

However, on the technical level, the lack of technical and journalistic training offered to developers by newsrooms, lack of support and financial resources, as well as the full dependence on Western technologies as late adopters/consumers (not early inventors) were reported as three main challenges encountered by Egyptian developers contributing to hindering or slowing-down the diffusion or adoption of innovation processes in Egyptian newsrooms. *Industry Expert 1* explained how the lack of innovation labs and investment in tech development have led newsrooms to use tools available online for anyone, leading to a lack of technological autonomy/agency. Hence, he argued: “As long as we are mere users who cannot be in control of this technology, we will encounter various problems related to bias, inaccuracy, and copyrights”. Developers further explained how their innovative ideas do not always get rejected because of resistance or financial expenses, but rather the duration of time invested that might not pay off such as new features that will not generate more website traffic.

Also, *Developer 1*, working for *Cairo 24* website, reported how it is perceived as the programmers’ own responsibility to upgrade their own technical skills, with no regular training offered to them by news organizations either on news or latest technologies and AI tools:

Technology field is evolving so fast unlike other types of jobs that have updates every four or five years. Thus, developers need to be updated every single day due to the continuous changes in AI tools so. We have to improve our skills via attending courses and trainings through Udemy, YouTube, Google, and so on in order to adapt with technological advancements. Hence, I can say it’s not a matter of lack of tools, rather, adaptation to technology.

Discussion and Conclusion

Our findings demonstrated how the pace and scale of innovation diffusion within Egyptian newsrooms are shaped by a range of influencing factors including the digital infrastructure, the financial resources dedicated to technology development, the lack of data transparency and innovation labs, as well as misconceptions about technology leading to resistance, as has been seen in some other countries in the Global South (Ashfaq et al., 2022; Jamil, 2020; Okiyi & Nsude, 2019). Many journalists in our sample are willing to experiment with new GenAI tools aiming to facilitate their personal work routines or enhance their relationship with audiences through interactive chatbots and recommendation systems reinforcing both the technological and relational angles of news innovation (Von Nordheim et al., 2018). In other words, innovation of process, related to newswork practices, was gradually introduced when simple GenAI tools were conservatively adopted by individual journalists to facilitate existing tasks without allowing innovation to perform drastic transformative changes to their professional norms and culture. To the contrary, cultural innovation (either organizational or professional) is still slow in many newsrooms. On the organizational level, news managers appeared to be less willing to invest in long-term training or more adventurous types of technological adoption. Coupled with journalists' suspicion of what AI might do to their own jobs, the conflict between technological, managerial and journalistic logics stymied advances. This was also seen in other African countries including Nigeria (Okiyi & Nsude, 2019).

Managerial logics tend to emphasize risk reduction (time, infrastructure, financial costs), making newsrooms cautious about experimenting with innovative approaches which might hinder or delay cultural innovation. Taking the data journalist unit as an example, innovation becomes a priority to a newsroom when it not only aligns with the newsroom's marketing strategy as an early adopter of smart tech, but also when it proves to be financially viable with low tech-related costs, and a direct potential to build capacity and increase profitability (cf Lischka, 2020). This leaves Egyptian newsrooms at risk of falling behind Gulf countries in the Arab region, where managerial, technical, and professional logics have more closely aligned (Saleh & Hasan, 2020). This proves how cultural innovation, pertaining fundamental changes in organizational culture and practices, is usually harder to achieve than technological innovation that focuses merely on tools and processes (Von Nordheim et al., 2018)

Due to the relatively low salaries of journalists in Egypt (Webb, 2014), it has been seen as cheaper in the short-term to continue to employ reporters rather than invest in digital innovations, which may also include investing time and money to train such journalists to use them or hire teams of technologists to develop tools. In particular, the current shortcomings of AI for the global south newsrooms, including the algorithmic biases and challenges (Johnson, 2021; West et al, 2019), and lack of data sets in non-western languages (Fu, 2022), can leave Egyptian managers more reluctant to promoting such technologies and/or provide an excuse not to do so.

News managers in this study often show little interest in committing to long-term technology-driven strategies aimed at experimenting with innovation if they have uncertain outcomes or do not involve an immediate influence on increasing business profitability or enhancing news production performance. This is even more challenging since some Egyptian newsrooms do not have long-term tech-adoption strategies. Instead, they often rely on the managerial preferences and decisions of their current leaders, whose willingness to embrace new technologies can vary greatly. The data journalism unit is one example for how professional and technical logics are not enough to support innovation if news managers have different priorities and personal inclinations, particularly if this requires investing in necessary training of journalists before seeing any major changes (see also Allam & El Gody, 2023; Bunce, 2019 for similar conflicts).

Due to the lack of training provided by news organizations and the Journalists' Syndicate, individual journalists are burdened with the responsibility of self-learning about news technology including AI and data journalism tools. This added workload might make some of them less inclined to alter their daily work routines, leading to resistance to adopt news innovations (Elaasser et al., 2024). Without a comprehensive future-oriented plan by Egyptian newsrooms, journalists will struggle to cope up with the technological advancements and optimize new tools and systems for their full benefits. While many journalists and developers perceive AI as a tiny helper or assistant rather than a threat to human journalists, there is a need for more awareness about the news innovation divide between the Global North and South countries and the potential influence of technological colonialism on news dissemination, power imbalances, and minority marginalization. This is particularly alarming due to the increasing control and monopolization of data resources and AI tools by a few (western) tech giants defeating the quest for unbiased and

equitable AI technologies (Cools & Diakopoulos, 2024).

This study comes with a few limitations. Gaining approvals from news managers for prolonged access to their newsrooms to conduct ethnography was very challenging due to the work pressure, busy schedules, and time constraints journalists have which hindered collecting in-person observations. Future researchers should hold comparisons between newsrooms in different countries in the Global South shedding lights on the most successful experiences to explore how some newsrooms have successfully mitigated technical, financial, managerial, and professional challenges.

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