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Exploring News Innovations, Journalistic Routines, and Role Perceptions during the COVID-19 Pandemic: A Case Study of Egyptian Journalists

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ABSTRACT

Drawing on in-depth interviews with 21 Egyptian journalists, this study offers a comprehensive understanding of how the COVID-19 pandemic has reconfigured news work and journalistic routines in Egyptian newsrooms. In so doing, the paper examines the various technical and logistical challenges encountered by Egyptian journalists as well as their changing role perceptions during the emergency health crisis. It further investigates the innovative practices adopted by newsrooms, on both the news content and newsroom levels, to overcome those challenges in terms of sourcing norms, news production routines, and storytelling formats. Findings demonstrate that Egyptian journalists struggled at the beginning of the pandemic, but started to find creative solutions to overcome the many practical and infrastructural challenges. The pandemic accelerated the digitization of editorial news production systems and the unprecedented adoption of news automation and artificial intelligence technologies. More dependence on interactive digital storytelling formats and data visualization tools was reported. Journalistic innovation occurred therefore as recombination of already existing products or services, but not new inventions. In terms of role perception, there was a shift to a more facilitative role, in which science and more quantitatively oriented forms of journalism play a central role.

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Introduction

Journalists played a crucial role in disseminating health-related information about the virus and vaccines, connecting people with resources, explaining the social, political, and economic consequences of the pandemic, and questioning state authorities about their choices and decisions (Vuillemin 2020). Perceived as a “critical moment for digital journalism” (Quandt and Wahl-Jorgensen 2021), media workers around the globe have encountered unprecedented challenges to report on the crisis accurately and safely including financial struggles, increasing brutality against journalists, and the need for

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accelerating the adoption of journalistic innovation in the media industry (Newman et al. 2021; Reliefweb 2020). In so doing, the pandemic has profoundly reconfigured the way journalists “interact with each other, society, their sources, as well as the way they gather, process and disseminate the news” (Santos and Mare 2021, 1407) bringing transformation in journalistic routines, working practices, and audience behavior (Quandt and Wahl-Jorgensen 2021).

In Egypt, however, many newsrooms were unprepared for these challenges and innovative digital transitions. On the one hand, the slow internet connection, lack of digital skills by some journalists, and geographical lockdown measures posed various logistical, organizational, and operational constraints. On the other, suspicion about the government’s lack of transparency in reporting the actual numbers of coronavirus infections during the first months of the pandemic have led to the diffusion of misinformation and rumors (Kaldas 2020). This unique pandemic situation requires investigating the various reporting challenges encountered by Egyptian journalists, but also of the journalism innovations adopted by newsrooms to overcome them. It further requires re-examining some of the elementary functions of journalism (Hanitzsch and Vos 2018). These include in particular the critical-monitorial function that understands journalism as a watchdog that holds those in power to account, contributing to an informed and critical citizenry. The other conventional dimension is the developmental-educative function, which conceives journalism as fundamentally interventionist, contesting journalism’s function as a simple witness bearer, but rather as an active force that shapes and promotes social change. Both dimensions are related to the specific roles of the watchdog (Waisbord 2009) as well as the educator (Schramm 1964).

To this end, the paper examines how Egyptian journalists perceive their changing social role during the pandemic as well as the technical and logistical challenges that might influence or limit practicing these roles. The paper further investigates how the restricted media environment and technical challenges have urged Egyptian journalists to develop innovative practices by adopting novel sourcing norms, news production routines, and storytelling formats as counter-tactics to facilitate the process of newsgathering and fact-checking, acquire reliable information and visual footage, and get access to credible sources in hospitals and health facilities. The paper draws upon 21 semi-structured interviews with Egyptian journalists working for public and private media outlets aiming to answer three main research questions:

RQ1: What technical and logistical challenges did Egyptian journalists encounter when reporting on the Covid-19 pandemic?

RQ2: What innovative practices regarding sourcing norms, news production routines, and storytelling formats were adopted by Egyptian journalists to overcome those challenges?

RQ3: How do journalists perceive the changing nature of their roles during the pandemic?

Conceptualizing Innovation in Journalism

Innovation has become a buzzword in the news industry as well as in journalism, covering a lot of ground and, often, missing a clear definition. Hence, innovation is often used as an “umbrella term” (Schützeneder 2022) to describe changes occurring in different areas

such as production, distribution, but also marketing or business models. The same applies to research into journalism innovation, a field that has seen a rather inconsistent development (García-Avilés 2021), but that has become a relevant field of research since the 1990s (Belair-Gagnon and Steinke 1990).

Innovation can be understood, following Rogers (2003, 12ff), as a specific idea, an approach, or even an object that is perceived as new and as an improvement compared to an earlier condition. In the case of journalism studies, even if a multitude of definitions exist in relation to innovation (Baregheh, Rowley, and Sambrook 2009), Pavlik (2013, 190) identifies some general traits of innovation like improving services, products, and increasing revenue or the target audience. In addition, innovation also involves the ability to adapt to changes either by developing something entirely new, or by recombining existing products, services, or knowledge. Hence, we are not necessarily talking about something completely new, but innovations can be a “new combination of already existing ideas, competences and resources” (Storsul and Krumsvik 2013, 14).

Innovation means that news organizations need to be able to adapt to new circumstances, which gives them the potential to stand out from the crowd: “Innovation is the multi-stage process whereby organizations transform ideas into new/improved products, service or processes, in order to advance, compete and differentiate themselves successfully in their marketplace” (Baregheh, Rowley, and Sambrook 2009, 1334). Technology in particular offers a means to tackle periods of transformation (Storsul and Krumsvik 2013). Again, Pavlik (2013) has shown that communication technologies have contributed to changing the core practices of journalism, transforming how news is gathered, produced, and disseminated. Examples such as algorithms or automation (Thurman, Lewis, and Kunert 2019; Zamith 2019) show that digital technologies have become pervasive in the journalism production process.

Innovations need to be implemented in a socioeconomic context, which means that organizational aspects cannot be eluded. Diffusion of innovative ideas inside newsrooms is a result of various factors including the “newsroom’s history as well as its social, cultural, and economic context” (Allam and El Gody 2023). Several authors also point out that both the organizational culture (Küng 2013; 2015), and the organization’s mindset (Storsul and Krumsvik 2013) play a central role when it comes to the necessary preconditions to implement innovations in a newsroom. In other words, they are crucial in terms of the diffusion of innovation, and how individuals such as digital journalists adopt new technologies, taking into account both situational (e.g., an unexpected pandemic or change-adverse senior management) as well as internal and external structural factors such as hierarchies or the characteristics of the media system (Rogers 2010).

Journalism in a Global Pandemic

The ability to react to specific problems and circumstances became relevant during the COVID-19 pandemic, where journalistic practices and workflows have been put under heavy pressure. In these circumstances, identifying the problem and finding a solution required the ability of news organizations to mobilize their creative potential in a short period of time. According to Küng (2013), media management covers a crucial role when it comes to short-term changes, not only because they carry the responsibility for the transformation, but they need to implement a communication strategy informing

staff members, and convincing them about their ideas. However, during the pandemic, both management and staff members were faced with additional Covid-related challenges like “work overload, psychological distress, and job insecurity” (García-Avilés 2021, 1239). Working continuously in a virtual newsroom (Lee 2021), in a context of uncertainty, was often perceived as an existential threat (Perreault, Perreault, and Maares 2021) due to the fact that journalists “covering the COVID-19 pandemic are experiencing levels of anxiety and depression similar to those seen in first responders” (Osman, Selva, and Feinstein 2021, 1).

The pandemic represented a turning point in many different ways since its impact ranged from reconfigured relationships in (virtual) newsrooms (García-Avilés 2021), shifting news and sourcing practices (Mellado et al. 2021), a deterioration of journalists’ working conditions (Casero-Ripollés 2021), an increased political and state influence on press coverage through data (Wu 2021), a brokerage of knowledge through data (Pentzold, Fechner, and Zuber 2021), and, eventually, the adoption of innovative digital media technologies, new formats as well as content distribution channels such as newsletters (Santos and Mare 2021; Casero-Ripollés 2021). However, while the pandemic exerted significant pressures on newsrooms and journalists, it not only contributed to the development of new and innovative production processes and formats, but it also contributed, through occupational and organizational discourses of professionalism, to altering journalistic roles and tasks, empowering “interdepartmental teams, and ultimately the trust of both the audience and the authorities” (Konow-Lund, Mtchedlidze, and Barland 2022). Journalistic roles are therefore at the center when it comes to the impact of both COVID-19, and of those changes that were implemented during the global pandemic.

Journalistic Role Perceptions

Role perceptions of journalists are a relevant factor to look at when it comes to innovations because they do not only influence the way journalists react to transformation processes, but they also offer an insight into the way journalists enact and narrate their role performance. Role conceptions have been extensively investigated, from the earliest work of Cohen (1963), to recent global investigations led by Hanitzsch et al. (2011) within the World of Journalism Study, to Mellado’s et al. (2017) research on the hybridization of journalistic cultures based on a comparison of journalistic role performance. Recent research has shown that roles reveal how journalists believe they should do their work, referring thus to “generalized expectations which journalists believe exist in society, and among different stakeholders” (Donsbach 2012).

However, role conceptions are not always able to grasp what journalists actually do due to factors such as political, institutional or economic contexts (Mellado 2015). While journalists expect themselves to behave according to specific normative expectations, these may be affected by different factors affecting daily newswork such as political or economic pressures, or elements that might well be related to innovation such as the introduction of new technology, or changes in routines (Tandoc, Hellmueller, and Vos 2013). This is particularly important in restrictive media environments, where journalists are suffering from limitations regarding their editorial freedom, because of a “substantial gap between journalists’ role conceptions and their perceived role enactment” (Ranji

2022). This kind of “gap” between professional ideals and journalistic performance is therefore

crucial to the analysis of forces affecting news production. Journalists [...] may also see their main role as that of acting as a “watchdog” over those in power, yet they may be unable to perform that role in most countries due to obstacles such as government control, corporate control over the media (e.g., owners have veiled corporate interests that might become compromised by watchdog stories), among others constraints. (Mellado 2019).

When it comes to established role perceptions, both the watchdog (Waisbord 2009) and the educator role are prevailing (Schramm 1964) since they are grounded on a specific normative perception of journalism’s function as critical-monitorial or developmental-educative (Hanitzsch and Vos 2018). The type of role journalists articulate in their work legitimizes or delegitimizes specific ideas, practices, and norms (Hanitzsch and Vos 2018, 151), which becomes relevant when confronted with new and innovative ways to produce news.

As transformation continues to happen, role perceptions become a crucial element to understand news organizations’ ability to cope with change. Grubenmann and Meckel (2017, 732) point out the importance of journalistic role perceptions as they affect the ability to innovate since

journalists who rely on an elitist, traditional role concept construct online journalism as a threat to quality journalism and journalists’ personal status. Another group of journalists with more service-oriented and solutions-oriented role concepts strives to improve newspaper’s online journalism. These journalists engage in creating new, adapted role scripts and value definitions.

Egypt: Media System and Political Economy

Considered a pioneer of media industries and communication technologies, Egypt has one of the oldest media systems in the Arab region where print journalism dates back to almost two centuries (Badr 2021). *Le Courier de l’Egypte* was the first Egyptian newspaper published in 1798 in French for Napoleon’s soldiers (idem). To protect stability and public interest, decisions made by the second Egyptian President Gamal Abdel Nasser in 1956 to nationalize the Egyptian media sector “made the state-owned media into a pivotal tool ‘to educate the masses’ but also to control them” (El Issawi and Cammaerts 2016, 553). Since then, the Egyptian political media system has witnessed several changes over time. The close ties between the Egyptian media system and the state for the past 60 years have urged media to engage in “promoting the main political, social, and economic programs of the regime, advocating its policies” (Allam and El Gody 2023, 282). While the Egyptian newspaper’s industry was fragile before the 2011 uprisings with interference and indirect control from the government to maintain power over media organizations, a noticeable increase in the number of private media outlets and development of online news websites has been witnessed since 2011 (Allam and El Gody 2023, 2019; Khamis 2011).

Today’s Egyptian media ownership comes in three different patterns: state-run, party, and private press. Publicly funded print media is financially supported by the state and goes in line with the official government agenda offering a smaller margin for mild

criticism (Badr 2021). They face various challenges including low circulation as sales of printing copies constitute their main revenue sources, over staffing, censorship, and economic pressure in selecting some of their editors-in-chief (Allam 2018; El Zahed 2013). Egyptian private media owned by business tycoons, however, follow “purely profit-oriented business models” allowing certain levels of freedom and challenging the uniform content of state-run media (Badr 2021, 225). While Egyptian party newspapers were introduced in 1970s and flourished in the 1990s, they severely struggle to survive nowadays with limited print circulation (*idem*).

The post-revolution era allowed new private media to develop introducing new players into the media scene, especially the religious channels which were shut down after the Muslim Brotherhood was declared a terrorist group by the military-backed Egyptian government in 2013 (El Issawi and Cammaerts 2016). Scholars describe today’s Egyptian media as a transitional system because it is still unsettled and under debate although it “experienced steady changes for more than a decade” (Allam 2019, 1274). Egypt ranks 168 (out of 180 countries) in the World Press Freedom Index (Reporters Without Borders 2022). Three regulatory bodies were established in 2017 to regulate media and combat journalists’ violations of professional practices including the Supreme Media Regulatory Council, the National Press Authority, and the National Media Authority (Allam 2018; Badr 2021). While these regulatory councils are positive steps towards developing codes of ethics and protecting the public interest, they can also be used to narrow the supposed press freedoms given by the constitution leading to a more restrictive media environment (Badr 2021).

According to the latest statistics in early 2022, there are 75.66 million internet users in Egypt with an internet penetration rate of 71.9 percent of the total population (Kemp 2022). Although most of the public and private Egyptian newspapers have both print and digital versions, private newspapers tend to have more developed infrastructure, higher online presence, and audience engagement rates than their public counterparts (Allam 2018). For example, the number of views for the private *Al Masry Al Youm* newspaper’s website increased from 900,000 in 2013 to 1.2 m in 2017 while the public *Al Ahram* newspaper’s website dropped from 850,000 in 2005, to 71,000 in 2017 (*idem*).

Both the context of the media system as well as the political context need to be taken into account to understand the Egyptian journalists’ perceived role. This is crucial because, as Vos (2016) showed, roles are often historically constructed and socially performed. On the grounds of the worlds of journalism study (Hamada 2017), journalists in Egypt tend to see themselves as detached observers, wanting to offer information people need in order to make informed decisions. At the same time, there is a perceived limitation in journalistic autonomy: on the one hand, Egyptian journalists reported that they are sometimes unable to select freely stories and angles, on the other the level of editorial freedom varies widely (Hamada et al. 2019, 148; see also Hanitzsch et al. 2019). In other words, Egyptian journalism is in a moment of profound transition, which can also be seen in the “increase of the importance of their professional freedom and their interactions with their audiences” (*idem*, 4).

Methods

Over three months (from June to August 2021), 21 semi-structured interviews with Egyptian journalists and senior editors (13 males and 8 females) were conducted via Zoom and Facebook Messenger calls. Participants ranged in age from 28 to 45 years old and worked in eight leading state-owned and private print newspapers and news sites including (a) *Al-Ahram Weekly* (state-owned English-language print newspaper with online editions and 702,006 Facebook followers), (b) *Al-Akhbar* (state-owned Arabic-language print newspaper with online editions and 5,408,492 million Facebook followers), (c) *Al-Fajr* (private-owned print Arabic-language newspaper with online editions and with no currently accessible Facebook page), (d) *Al Youm Al Sabea (Youm7)* (private-owned Arabic-language print newspaper with online editions and 26,834,603 million Facebook followers), (e) *Cairo 24* (private Arabic-language digital native news site with 6,145,296 million Facebook followers), (f) *El Shorouk* (private Arabic-language print newspaper with online versions and 5,569,130 million Facebook followers), (g) *Masrawy* (private Arabic-language digital native news site with 9,214,442 million Facebook followers), and (h) *Daily News Egypt* (private English-language print newspaper with online versions and 483,546 Facebook followers) see [Table 1](#). The sampling followed a purposive snowball technique where only journalists who were working in news media during the pandemic and covered stories related to the health crisis were interviewed and asked to recommend and nominate other potential participants who are relevant to the study.

Participants were asked five sets of questions including: (a) background information about their journalistic career and the nature of their journalistic coverage during the COVID-19 pandemic, (b) the main logistical, technical, financial, and ethical challenges they encountered during the pandemic and the innovative practices they took to overcome them, (c) how the pandemic has influenced their news production routines, sourcing norms, and storytelling techniques, (d) the different measures taken by their newsrooms to combat the infodemic including misinformation, conspiracy theories,

Table 1. Participants' affiliations and years of experience

No. of journalist	Title and affiliation	Years of journalistic experience
J1	Investigative journalist at <i>Masrawy</i> news website	5 years
J2	Investigative journalist at <i>Al Akhbar</i> newspaper	10 years
J3	News correspondent of <i>Al-Ahram Weekly</i> newspaper in Alexandria	13 years
J4	Senior science and technology journalist at <i>Youm 7</i> news website	10 years
J5	Senior news editor, <i>Daily News Egypt</i> newspaper	9 years
J6	News correspondent of <i>Cairo 24</i> news website in Alexandria	12 years
J7	Social media manager at <i>Youm 7</i> news website	7 years
J8	Economic journalist at <i>Al-Akhbar</i> newspaper	10 years
J9	News editor at <i>El Shorouk</i> newspaper	18 years
J10	Video journalism at <i>Youm 7</i> in Cairo	12 years
J11	Senior editor at <i>Al Fagr</i> news website	10 years
J12	Freelance news reporter	11 years
J13	Freelance news reporter	13 years
J14	The managing editor of <i>Cairo 24</i> news website	Prefer not to say
J15	News presenter at <i>Cairo 24</i> news website	Prefer not to say
J16	Desk editor at <i>Masrawy</i> news website	14 years
J17	News presenter at <i>Youm 7</i> news website	2 years
J18	Freelance video journalist	8 years
J20	News reporter at <i>Youm 7</i> news website	10 years
J21	Health reporter at <i>Masrawy</i> news website	11 years

and rumors about the pandemic on social networks as well as the digital tools they used for fact-checking and data verification, and (e) their perceptions of the changing nature of their roles during the pandemic and the future of science journalism in Egypt.

Because many journalists refused to use their names in the research, especially those working for state-run media, the participants will only be referred to with numbers and affiliations to their news outlets. The interviews lasted for 45 min on average. With the help of Nvivo 10 pro software, thematic analysis was conducted to draw out relevant insights and build connections between the theoretical concepts and the interview data. Drawing upon Webb's thematic analysis guidelines (2017), we first conducted open coding to identify recurrent ideas and list emerging themes from the data. Next, we grouped codes into categories and made new connections among them using the process of axial coding to develop theoretical extensions.

Research Findings

First: Technical and Logistical Challenges During the COVID-19 Pandemic

To answer RQ1, this section explains the main challenges encountered by Egyptian journalists while reporting on the COVID-19 pandemic and the measures taken by newsrooms to overcome them:

Technical Challenges

Lack of digital infrastructure, digital skills, and journalistic training: The poor and costly internet connectivity and lack of access to digital infrastructure were reported as major challenges by many participants. For example, some journalists reported not having a personal computer or laptop to use at home during the lockdown and writing news stories on a mobile phone was very disturbing. Other journalists did not have a Wi-Fi router for internet connection at home and some could not afford to pay for it. To encounter this, a few major newsrooms including Youm 7 newspaper and Masrawy website asked the heads of their departments to survey the number of journalists who needed laptops and offered them computers/laptops. In a further step, *Journalist 4*, a senior science and technology journalist at Youm 7, explained how her newspaper "offered paying for the cost of internet, extra bundles, and USB modems at home and reimbursed the home internet invoices of journalists" but could not do this for a longer time because it was very costly. As an alternative, the newspaper advised its staff to apply for the grants offered by Facebook in cooperation with the American University in Cairo to get a "Myfi" device which is automatically renewed each month for free.

The lack of digital skills and journalistic training was another major challenge reported by many journalists. Some participants argued that before the pandemic, the digital transition was mistakenly perceived in some newsrooms as merely creating a website or a digital version for the print newspaper and publishing stories on it. However, *Journalist 11*, the editorial secretary of AlFajr news website, explained how the pandemic revealed that not every print newspaper with an online website can "claim to undergo a digital transition" without having the essential digital tools or training journalists on using them. He further argued that digital journalism is also misunderstood by some news

outlets who tend to recycle the same information published either in their print versions or by other news websites:

The problem started when some print media decided to create digital versions without training the staff on digital media production. When we started to work from home, we found out that most journalists do not have digital tools because they were not trained for using them. Many media outlets realized the importance and urgency of digital transition recently. Only 20% of the media outlets in Egypt care about training their journalists or developing their digital skills.

In his opinion, the pandemic proved the importance of learning the basics of mobile journalism, understanding the policies of Facebook and Twitter, and knowing how to create networks for communication with people/sources internationally, how to cover events remotely in places of conflict and pandemic, and how to verify the information and fake news circulated on social media. However, “most of the Egyptian journalists still do not have these essential skills” and some elderly journalists still find it difficult to use basic digital tools such as writing stories using Microsoft Word, as he further noted.

Challenges of running virtual newsrooms: Virtual newsrooms refer to “journalistic practices in digital spaces” (Bunce, Wright, and Scott 2018, 3383). As Egyptian news organizations took measures to reduce the number of people working from the office, almost all the participants explained how the digital transition of their newsrooms involved relying on various video conferencing software including Zoom or Microsoft Teams to carry out daily editorial meetings and brainstorming sessions. Many participants reported creating WhatsApp groups for each news team in order to facilitate communication with team members and leaders working from home, assist with technical difficulties, and follow up on the news production process. Although such virtual spaces “reconfigured relationships among colleagues and increased collaboration, shaping news practices and communication protocols” (García-Avilés 2021, 1239), they also caused a lot of confusion among journalists at the beginning of the lockdown. *Journalist 11* noted:

Journalists created a lot of WhatsApp and Facebook groups for communication which caused confusion and increased miscommunication. To facilitate the workflow, I suggested that during work, all of the journalists should stay online on Zoom to instantly communicate when we need to. However, it was expensive for our newsroom to subscribe to monthly Zoom Pro Plans to get unlimited meeting minutes, and thus was hard for journalists to keep in touch with their teams around the clock.

Logistical Challenges

Accessing official information and sources: All of the participants reported being guided by their news organizations to commit to publishing the daily official figures and reports released by the Ministry of Health about the numbers of infected and deceased patients. *Journalist 9*, a news editor at El Shorouk newspaper, explained that the state enforced a certain publishing policy that restricted media workers from using data and numbers from non-official sources. This put journalists on the horns of a dilemma. As *Journalist 8*, an economic journalist at Al-Akhbar newspaper noted, it was not always easy to reach certain officials in ministries because many journalists were requesting information at the same time. However, journalists had no other option. As he further noted, publishing

unofficial numbers “would endanger the journalist who might be blamed for stirring up strife or using the pandemic to scare people.” Unsurprisingly, some journalists perceived this governmental restriction on news sourcing as a necessary step for preserving national security. *Journalist 9* argued:

I was committed to publishing the official numbers because maybe at the time, and for the public good, that was better for society, economics, and tourism. So it was a case of national security more than just releasing news stories.

A similar dominant role of the state in constructing pandemic news was also found in Latin American newsrooms where political sources were more popular in coverage reflecting a strong elite orientation and “a common characteristic of journalistic cultures in which the media privilege official political events and actor” (Mellado et al. 2021, 1280). This is particularly important in times of crisis when sourcing holds “substantial framing power in news reporting of the crisis” (van der Meer et al. 2017, 1108).

Second: Implementation of Innovation in News Production Routines, Storytelling Formats, and Virtual Sourcing Norms

To answer RQ2, this section discusses the innovative practices and creative responses related to the news production routines, sourcing norms, and storytelling techniques adopted by Egyptian journalists to overcome news reporting challenges during the COVID-19 pandemic:

News Production Routines. Egyptian journalists reported drastic changes in their daily work processes and journalistic routines. This is consistent with findings from the Southern African news organizations where COVID-19 induced the adoption of digital media technologies and reconfigured news work including newsgathering, distribution, and business models (Santos and Mare 2021). Most of the participants reported how the pandemic accelerated the digital transition in their newsrooms although they have been postponing this shift for years. This was even more urgent for public media whose guaranteed streams of revenue made them less motivated to adopt innovation and creativity before the pandemic than their non-state counterparts (Santos and Mare 2021). For example, Al-Akhbar newspaper, one of the oldest daily Egyptian state-owned newspapers, did not fully activate its digital news production system till the pandemic started although the system existed several years earlier. *Journalist 2*, an investigative reporter and desk editor in the newspaper, reported how some journalists in the newspaper used to follow the same traditional news production process that involved printing news stories on paper for content revision and design for the last 20 years. Although the newspaper had access to a digital editorial workflow management system called *NewsPublish* that facilitates the news submission, editing, layout, and design processes and eliminates the use of paper, the digital system was not fully activated till the pandemic started. As he explained:

Many journalists were used to the old system where they print news stories on paper, send them to the editors who also make changes on paper, and return them to journalists to update their stories and print them again. Even the designers used to draw the initial layout on paper first and copy it later on their computers. This led to consuming a huge amount of paper because every story is printed at least three times.

However, the outbreak of the pandemic obliged journalists to change these traditional news production routines and use various digital tools to make the workflow faster. As he further reported, this was a big challenge at the beginning, especially for elderly journalists, however everyone learned how to work with the digital system with time and practice. Similarly, *Journalist 5*, a senior news editor in Daily News Egypt newspaper, explained how journalists learned to use Trello web-based application to upload and edit articles and photos aiming to save time and facilitate team coordination among journalists, editors, copy editors, and designers during the lockdown. Alternatively, *Journalist 21*, a health reporter at Masrawy news website, mentioned his newsroom's use of online Slack rooms for each news department to accelerate online team communication. None of these digital tools were familiar to those journalists before the pandemic.

Interestingly, the pandemic also accelerated the adoption of innovative news production technologies that were not used before in Egyptian newsrooms. For example, Cairo 24 news website was the first media outlet in Egypt to adopt artificial intelligence technology for news production during the COVID-19 pandemic to cover various topics including sports, economy, companies, entrepreneurship, stock market, telecommunications, and technology. They started with a small team of five professionals who have a background in programming and technology. As *Journalist 14*, the managing editor of Cairo 24 website noted:

Launching this AI service was a vision and a dream before the pandemic but we believed it was hard to achieve because it requires cooperation with many institutions to automatically draw information from their websites. However, when the pandemic started it was a big incentive and we believed it is time to try, succeed, and fail so we launched this feature. Implementing this technology was not easy at all, especially in Egypt where we are still in the early stages of digital transformation.

Although the news produced by artificial intelligence technologies is sometimes problematic, *Journalist 14* further explained how their staff members are trained to detect mistakes in the automated headlines and uploaded news content and fix them in a few minutes. Hence, their media institution did not receive any complaints from the readers about any of the news pieces produced by AI technology. According to *Journalist 15*, a news presenter at Cairo 24, the adoption of this AI service allowed the newsroom to produce the same number of stories during the lockdown with no problems although the news organization had to reduce the number of staff working from the office in every shift. In her opinion, financial resources will not be a barrier in the face of adopting AI in Egyptian newsrooms on a greater scale because big Egyptian media outlets with wide reach on social media platforms make huge profits and get financial support from many sponsors.

However, the problematic digital infrastructure and untrustworthy internet connection in Egypt might be the main obstacle.

Adopting new storytelling formats/techniques. Most of the participants reported a significant change in their digital news storytelling techniques, especially in covering stories about the pandemic. Less dependence on textual storytelling formats and increasing use of data journalism, infographics, videographics, transmedia/cross-media storytelling, and data visualization tools were reported by many journalists, especially those working for Youm 7, El Shorouk, and Cairo 24 news websites. Such interactive storytelling formats were adopted by some newsrooms as "new revenue generation methods" to

engage audiences and survive the advertising revenue decline during the pandemic (Santos and Mare 2021). Even journalists working for news websites that focused on data visualization and video journalism before the pandemic explained how the availability of big statistics and numbers has required and facilitated the production of audio-visual news content. For example, *Journalist 4*, a senior science and technology journalist at Youm 7, explained how her media outlet focused on producing more video journalism content since the pandemic started:

Although our newspaper focused on producing visual content before the pandemic, it became more important now and the newspaper started encouraging and praising journalists who produce news in the form of visuals, photos, infographics, and videographics to simplify information for readers. Journalists are encouraged to suggest more ideas for the online TV channel of the newspaper.

To this end, *Journalist 7*, a social media manager at Youm 7 website, explained how the website processed its news content for easier viewing and data digestion and less broadband consumption by users which, in turn, increased their reach, impression, and interactions. This was fostered by the increasing production of infographics for reporting updates on the numerical data of the infected and deceased patients as well as videographics to summarize the COVID-related information and recommendations in one or two minutes. Similarly, *Journalist 9*, a news editor at El Shorouk newspaper, reported how it was extremely hard to deliver numbers in the conventional text format to readers. Aspiring their content to be dynamic and attractive, the editorial policy for their social media pages involved “utilizing more imagery with simplified messages and more video content to avoid confusing the readers with the extended usage of numbers.”

Another strategy for enriching the visual content of the newspapers' websites and social media pages was moving newscasts, one of the main features of traditional media, to the online context in a more interactive and easy-to-follow way to increase people's interest in the news. For example, Youm 7 newspaper released its Youm 7 TV channel on the internet last year to produce daily online newscasts. Similarly, Cairo 24 news website launched online newscasts and live-streaming services allowing more citizen journalists to actively participate in the news production. To enhance their visual content production, some newsrooms allocated months to produce a few high-quality news pieces using multiple multimedia tools. For example, *Journalist 1*, an investigative journalist at Masrawy website, explained working on his interactive cross-media investigative report called “Pandemic in Cairo” for nine months to document the exceptional crisis in one piece and cover its influence on the different aspects of life in the Egyptian society. A separate website was designed by a specialized programmer to publish the investigation that included 8500 words, 110 photos, infographics, and hyperlinks and covered how 10 sectors in Egypt were influenced by the lockdown procedures taken by the government.

However, some newsrooms were not prepared to adopt these novel storytelling formats. Urged by their financial loss during the pandemic, many print newspapers decided to set plans for developing their online content and social media pages although they did not have a clear vision for activating their online platforms before the health crisis. To this end, *Journalist 8* from AlAkhbar newspaper argued that the pandemic was “a big shock for journalists working in print newspapers as their circulation rates were affected by

rumors about newspapers conveying the virus.” The lower circulation rates of the newspaper and the fewer advertisements it received have significantly influenced its monthly profits since his newspaper did not depend on its social media pages as a main source of income and neither updated its YouTube channel nor used Google AdSense to get money from its online content. To overcome this, *Journalist 2* explained that AlAkhhbar newsroom currently works on upgrading its online platforms and ordered new multimedia news production equipment for shooting and editing to enhance its audiovisual news production:

It was obligatory to develop our news presentation during and after the pandemic. In Akhhbar El Youm, there was no care for producing video journalism or short reports that include photos or videos with short captions and music. Now, we have an interest in creating more visuals such as photos and infographics, even in the print version, about the new types of vaccinations and infection numbers.

In this sense, many journalists realized the importance of producing interactive content on social media platforms as well as podcasts on the new online applications such as Club House describing it as the future for a sustainable journalism industry. Many participants also reported paying more attention to what interests the ordinary citizen using digital tools such as Google Trends and Google Analytics to identify the most popular topics on social media and assign stories about them to their journalists. According to *Journalist 4*, a senior science and technology reporter at Youm 7, this strategy enabled her newspaper to gain more popularity and reach during the pandemic as they managed to cope up with the needs of the people producing “a public service-oriented journalism” that is closer to the public (Garcia-Avilès et al. 2019)

Virtual Sourcing Norms. Participants reported depending on four main sources of information during the pandemic: official sources, international and local health organizations especially World Health Organization, NGOs and scientific research institutes, international media including foreign news agencies and news websites, as well as citizen sources. In so doing, many journalists reported how the pandemic forced them to leave their comfort zone, diversify their online news sources, and experiment with remote field reporting using various digital platforms. In particular, contacting sources outside Egypt was new to most of the journalists as it was not popular to depend on foreign sources in daily news reporting before the pandemic. Journalists reported using technology to find creative ways to reach online sources and gather news in other countries such as searching the Facebook groups of foreign expatriates and asking citizen journalists to gather first-hand visual materials for them. As *Journalist 11* explained:

At the beginning of the pandemic, we wrote stories about the evacuation procedures of Egyptian families who were stuck in China and it was surprisingly easier to get information from Chinese official sources and doctors than getting information from inside Egypt. We contacted the Facebook groups of Egyptian diaspora groups in Italy, and we listened to their complaints. In the Chinese cities where people cannot use Facebook, we reached people through “We chat” and “Sina Weibo” and asked those families to take photos and video clips of empty streets, or put us in contact with doctors and friends.

Online sourcing also involved interviewing sources via Zoom or Skype and/or getting Covid related updates from the official social media pages of Egyptian hospitals because visiting medical clinics to interview doctors was impossible and thus, many hospitals moved some

of their activities online. For instance, *Journalist 6*, a news correspondent for Cairo 24 website, reported how the official Facebook page of Agamy Al-Takhasosy hospital was the main source of her human interest stories about the frontline workers, especially doctors and nurses. Also, doctors in Alexandria created various Facebook and WhatsApp groups where they provided medical and mental health advice to people for free. Contacting doctors via these online groups was and still is one of her daily sourcing routines.

However, some participants reported that depending on citizens to shoot inside the isolation hospitals was sometimes problematic and needed further verification. As *Journalist 12* elaborated on the potential of using online tools and journalists' networks for news verification:

Instead of having two or three correspondents in a place, now you have 50 citizen journalists. But verification is always key. Google offers a range of tools that always come in handy to double-check videos, photographs, voice, and more. Also, the role of journalists' WhatsApp and Facebook groups is important. If one journalist posts a link or a multimedia item in our online group, everyone helps him with the content verification

Similar use of social media for newsgathering and sourcing was reported by journalists in the Global South as a way to challenge the increasing anti-press violence even before the pandemic. For example, Mexican and US journalists adapted their offline routines to an online environment where social media became more salient for newsgathering and dissemination, as well as circumventing the state and organized crime groups to overcome aggressions against journalists covering the violent conflict in the state of Tamaulipas (González de Bustamante and Relly 2014). However, this dependence on digital technologies by journalists working in a context of violence can be a "double-edged knife." as it exposed them to forms of digital risks, online harassment, and espionage (González and Rodelo 2020).

Third: Shifting Role Perceptions During the Pandemic and Lessons Learned

To answer RQ3, this section examines the journalists' perceptions of the changing nature of their roles during the COVID-19 pandemic as well as their optimism about the future of science journalism in Egypt.

Perceiving their roles as more important than ever before, participants reported three main journalistic role perceptions during the pandemic: (a) raising people's awareness and educating them about the virus, vaccines, and precautionary measures, (b) documenting the crisis and its influence on the different aspects of people's lives, as well as (c) fact-checking and data verification to combat the infodemic and conspiracy theories. Regarding the first role, most of the participants explained how their roles focused mainly on raising people's awareness about the virus and supporting the role of healthcare workers in hospitals, especially since many people did not believe in the seriousness and widespread of the disease at the beginning. As *Journalist 4*, a senior science and technology journalist at Youm 7 newspaper, explained:

I believe that raising awareness is more important now than any other time. In our science and technology section, we dive deep to explain how the new Covid-19 variant has spread, for whom this new variant is more dangerous, and what wrong information was published about it. We do not just offer news, we raise awareness and save people.

Furthermore, *Journalist 11*, a senior editor of Al-Fajr news website, argued that people perceived journalists as the “saviors” who will let them know what to do. In addition to serving the main roles of reassuring people, conveying the truth, and raising awareness about the precautions (e.g., use of masks, sanitizers, and handwashing), he felt a huge social responsibility to use his contacts to help patients who need medical care or oxygen tubes get in touch with the isolation hospitals. In this sense, *Journalist 8*, an economic journalist at Al-Akhbar newspaper, argued that the pandemic has retained the “journalism’s forgotten value” after many years of people saying that journalism is no longer important because social media and citizen journalism are enough. In his opinion, “verifying information distributed on social media, fighting rumors and misinformation about the wrong treatments of the virus, reassuring, and calming people in the time of a mass hysteria” are the most important roles of journalists, especially when the pandemic proved how the crucial role done by journalists in news verification can save lives.

Furthermore, *Journalist 1* argued that documenting the exceptional health crisis was a new aspect of his journalistic role that he never paid attention to before:

Although we might practice documentation unintentionally in our daily news production routine but focusing on it during the crisis was different. After 10 years, I can get back to a news story to get a sense of what happened in a certain country during the pandemic.

In particular, science and health journalists reported how their roles were perceived differently by their media institutions and audiences since the start of the pandemic. For example, *Journalist 4* argued that before the pandemic, the science section was one of the smallest departments in her Youm 7 media organization and there were no training workshops available for science and technology journalists in Egypt. Now, the attention is directed towards science journalists internally and externally:

Before the pandemic, no one realized there was something called science journalism in Egypt. Since the pandemic started, the senior management dedicated more editorial meetings to our science and technology teams and gave us more instructions on how to write health-related news and use catchy headlines because we offer the type of news that people need. Also, many workshops and grants are now offered by universities and training organizations to support science journalists.

Similarly, *Journalist 21* worked as a health reporter at Masrawy news site since 2017, however, he started to feel appreciation for his role after the outbreak of the COVID-19 crisis. He explained how the Egyptian audience started paying attention to science and health journalism and started reading the topics they publish more frequently. Like most of the other participants, he is optimistic about the future:

I think science and health journalism will continue flourishing as it has gained value and importance and many journalists started attending workshops to acquire skills in reporting science news, checking facts, and simplifying information because it’s directly connected to people’s everyday lives.

On a wider scale, participants argued that deciding whether the pandemic had a positive or negative influence on journalism in Egypt depends on the journalist and the media institution itself. On the organizational level, *Journalist 5* explained that the news websites or print newspapers with big manpower, resources, and digital skills could successfully survive the pandemic by advancing their news delivery techniques while media outlets

with fewer resources, digital journalistic training, and financial resources could not cope up with the new challenges. On the individual level, *Journalist 11* explained that those who developed their digital skills during the pandemic could professionally benefit from the pandemic while those who did not are “stuck.” To this end, *Journalist 14* believe that Egyptian journalists benefited on the professional, technical, and ethical levels although they were negatively influenced on psychological and financial levels.

As print newspapers suffered more than their digital counterparts because of the lack of ads and lower circulation rates during the pandemic, all of the participants argued that Egyptian newsrooms should learn the lesson and innovate their conventional means of news production. As *Journalist 9*, a news editor at El Shorouk newspaper, explained:

The pandemic gave leverage to the concept of digital journalism and enforced us to realize that we have no other alternative than focusing on the new school of online journalism. This unveiled new horizons and endless potential for our industry and even enforced a new approach on journalists who need to improve themselves and upgrade their skills in order not to lose their jobs in the near future.

Discussion and Conclusion: Theoretical Implications

Drawing upon first-hand accounts of Egyptian journalists, this paper maps out the various challenges, news innovations, and journalistic role perceptions during the COVID-19 pandemic.

Grounded on this paper's findings, the pandemic was an enlightening moment for Egyptian journalists to rethink their understanding of both their roles as well as the digital transition in terms of how to innovate their work routines and news reporting formats. In particular, the emergency health crisis was a wake-up call for some state-owned newspapers and small-sized news outlets who were not ready for the digital turn and neither had the digital infrastructure nor skilled staff to embrace remote digitally driven news reporting.

Similar to the technical challenges experienced by Namibian, South African, and Zimbabwian journalists during the pandemic (Ndlovu and Sibanda 2021; Santos and Mare 2021), Egyptian journalists struggled with unstable and costly internet connectivity, limited access to computers at home, and hardships of running virtual newsroom because of the lack of digital skills, especially among elderly people. Being compelled to report the official figures and relying on official/political sources were major challenges at the beginning of the pandemic but Egypt was not an exception in this regard. Literature reported the Singaporean and Latin American journalists' overdependence on the top-down data provided by state authorities and health organizations raising concerns about data objectivity and the role of power and social relations in constructing pandemic news and shaping the public discourse (Mellado et al. 2021; Wu 2021).

These challenges and restrictions urged Egyptian journalists to find alternative virtual sourcing techniques to widen their geographical coverage and reach various local and international sources. However, this overreliance on digital tools for sourcing and news gathering should not be celebrated without criticism as it raises concerns about cyber safety and source confidentiality, especially in repressive media environments where

mass surveillance over the internet is employed to restrict freedom of speech (Ndlovu and Sibanda 2021).

However, we cannot naively make general claims about the influence of the pandemic on reconfiguring the media industry in Egypt as the media system cannot be studied as a homogeneous whole. Thus, it is important to differentiate between those private profit-driven newsrooms that had a clear pre-Covid vision for producing multimedia news content making revenues on their social media platforms such as Youm 7, Masrawy, and Cairo 24 websites, and those public media who were still more dependent on their print versions and traditional storytelling formats giving less attention to producing interactive visual news content on their online platforms. The first group perceived the pandemic as an opportunity to experiment with innovative artificial intelligence technologies and employ new visual storytelling formats including infographics, videographics, online newscasts, and live streaming services. Our results thus further confirm that innovation often occurs as recombination of existing products or services (Storsul and Krumsvik 2013) and turns therefore out to be rather incremental. The solid infrastructure and pre-knowledge of digital skills facilitated their survival during the crisis enabling them to easily develop their news content, serve the informational needs of their audiences, and make bigger online reach and profits. Similar cases of news outlets that recorded a noticeable increase in advertising during the pandemic, such as Alpha Media Holdings in Zimbabwe and News 24 in South Africa, were reported in the literature (Santos and Mare 2021).

On the contrary, the second group was shocked and confused at first as the pandemic prompted an urgent need to “abandon traditional mindsets” forcing untrained or outdated journalists to update their digital skills and online reporting techniques (García-Avilés 2021). In some of these newsrooms, the pandemic served as “an amplifier or accelerator” for digital processes and strategies planned by the administration long time before the pandemic (Quandt and Wahl-Jorgensen 2021). The dropping advertising revenues urged them to activate their online news channels and buy digital equipment for producing video journalism. This supports claims by Santos and Mare (2021) on how “contextual factors such as access to technology, cost of data and the technical and financial capacity of the media organization” can shape the creative appropriation of digital technologies into newsrooms (1408). However, it is also important to consider the influence of the “transitional” media system (Allam 2019) and the current economic and political situation in Egypt on the late digital transition in many newsrooms. Current problems facing the media industry such as the erosion of the economic viability of media, declining professionalism, and the restrictive media environment add serious challenges to the adoption of technology and digital tools in many Egyptian newsrooms (Badr 2021, 230).

What also becomes apparent in the analysis is how the pandemic restored Egyptian journalists’ faith in the importance of their jobs and reconfigured their interrelations with news audiences, whose increasing dependence on social media and declining trust in traditional journalism was threatening to the industry (Dennis, Martin, and Wood 2015). Perceiving their roles as educating the public, documenting the pandemic, and verifying information, journalists’ perceptions reflect the “facilitative role of journalism” where connecting people with official sources and experts and gathering “relevant information about events, conditions, trends, and threats” are the main goals (Christians et al. 2010, 139). Grounded on these findings, it becomes clear that the pandemic has had

a considerable impact on the role perceptions of Egyptian journalists, but these changes have not entailed a certain “radicalization” in the sense that journalists became either change agents or showed a clear shift to an advocacy role. We can thus exclude that the pandemic has pushed Egyptian journalists towards a more critical-monitorial function. To the contrary, a more collaborative-facilitating perspective is usually at the opposite end of a critical and monitorial stance that challenges governments rather than being supportive to or openly defensive of authorities. Instead, the results point to a partial shift back to a more traditional identity as actors responsible for facilitating the news flow from (official but verified) sources to an interested audience in need of corroborated information in times of crisis. In addition, the clear focus on fact-checking information and verifying data to combat the infodemic and conspiracy theories also shows that elements such as science journalism and a more quantitatively oriented (data) journalism are becoming increasingly relevant, also from an educational perspective. As a result, the journalists operating in these fields are getting closer to the center of the journalistic field, gaining thus in reputation.

What do these findings tell us about the future of news innovation in Egypt? First of all, the pandemic has shown that (news) organizations need to be prepared for change. This is not at all an obvious statement, given that media organizations have often struggled with (technological) transformations. Küng (2017, 9) states that.

Established media run the risk of undermining their content transformation because they are putting too little effort into transforming their organisations. As a result, they are being outperformed by new players, although their content, brands, and commitment to their readers are often far superior.

The need to identify problems in the first place and then come up with a specific solution becomes ever more crucial as some of the problems are not only “natural” consequences of a crisis, but they may well be imposed by governments (such as the obligations to work from home and publish official sources and data).

However, the ability to tackle an existential crisis such as a global pandemic requires news organizations to foster primarily two elements that will be crucial: first, an open mindset that allows journalists (and technologists) to tackle unexpected problems with creative solutions through tinkering and experimentation (Salzmann, Guribye, and Gynnild 2021). This element however requires news organizations to employ actors with specific skills that can then be harnessed. An open mindset—or the implementation of a culture of innovation—combined with actors that do have the right skills can set the foundation for a more reactive organization. Even if this will not guarantee success (since there are other hurdles to innovation such as performance metrics, not enough autonomy, complex hierarchies, or approval procedures), it will at least increase the odds of surviving a critical crisis since it allows news organizations to react more flexibly to complexity and uncertainty.

The relevance of the experience made during the pandemic can be subsumed in one of the interviewee’s answer: “I do not believe it [the pandemic] was just an emergency and things will go back to the conventional means afterward.” Besides showing evidence for the need to improve the innovation capabilities of news organizations and offer proper digital training for journalists in newsrooms, we can also witness lasting changes to Egyptian journalism practice and profession due to a more quantitative, analytic, and overall

scientific approach. Generally, the findings show that there is simply no alternative to adaptation, but at the same time show one of the main difficulties of the news industry: as John Maynard Keynes wrote: “The difficulty is not so much developing new ideas as escaping the old ones.”

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