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The Data Journalism Practices in the Production of Investigative News Videos by Narasi TV

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Abstract

The digital and open data era has given rise to the development of methods in data journalism to create an in-depth or investigative news report. The widespread use of social media, dominated by the Y and Z generations, has also encouraged journalists to present the story in attractive formats. As one of the digital media in Indonesia, Narasi TV has data-based long-form stories called Buka Mata, presented in video forms and published through various social media. This research aims to answer the question, "How does Narasi TV produce the data journalism videos in Buka Mata?" to describe Narasi TV's data journalism practices. This study uses a constructivist paradigm, a qualitative approach, and the case study method; and refers to the data journalism concept from The Data Journalism Handbook in 2012 to solve the research question. The findings show that Narasi TV has implemented data journalism practices such as gathering, verifying, analyzing, and visualizing data in producing Buka Mata. Furthermore, Narasi TV also uses an open-source intelligence (OSINT) method to create its investigative news videos.

Keywords:
Buka Mata; data journalism; digital news video; Narasi TV; OSINT method

Introduction

Journalism has evolved into various media content. Recently, it has come out as a new trend in Indonesia called data journalism. This trend has become more popular because of the diverse content spread through social media, mainly Instagram. News media outlets realize that many people in Indonesia spend more time on social media rather than on news websites. In Indonesia, the Z generation—born between the mid-1990s and 2000—just as (Kalogeropoulos, 2019) explained, are more likely to consume news from their smartphones. They are also addicted to smartphones and consider it a necessity since it has become their primary communication tool (Ahn & Jung, 2016). Therefore, news media outlets also publish their content through social media. This practice indisputably makes the newsroom adjust its content to the nature of social media. For example, they make visual content, such as infographics, short videos, or pictures on Instagram. Those practices align with Kalogeropoulos' (2019) statement, arguing that the young generation in this era looks for news mostly on social media. He explained that young people prefer news stories that are entertaining, authentic, objective, and meaningful.

Narasi TV is one of the digital news media that distributes its news video content on social media, mainly on Instagram. Narasi Newsroom produces its news content in the form of graphic images and videos. In contrast to traditional television, they create short-length videos containing soft news or investigative news reports called Buka Mata. The video content production process for Narasi TV applies journalistic working principles that prioritize verification and

confirmation (Kencana & Djamal, 2021). Narasi TV also utilizes social media, especially Instagram, YouTube, Twitter, and Facebook, for distributing its videos, including those with news content. The format fits social media conditions, especially Instagram. Graphic content is created in a square size, while video content is oriented vertically (portrait) or horizontally (landscape). The news coverage consists of straight news, features, in-depth, and investigation.

This research aims to show the innovation of the digital media newsroom that creates in-depth news and data-based investigations in video format and publishes them through social media. This research specifically discusses Narasi Newsroom's process of producing news video content using data journalism and open sources. The innovations made by Narasi TV's newsroom (Narasi Newsroom) could be an example of digital media or media start-ups in delivering decent information to teenagers or young adults as the majority of social media users. This research aims to shed light on the changes in news consumption patterns among young people and the innovative approaches adopted by newsrooms to offer quality information. Therefore, the question of this research is, "How does Narasi TV produce data journalism news videos in the content of Buka Mata?" through this research.

Literature Review

Data journalism is an epistemological tradition where journalists switch to using data to report certain phenomena (Steensen & Westlund, 2020). The news reporting process leverages data science, which involves searching, collecting, monitoring, and organizing data, doing statistical analysis, and processing data to be presented to the audience in an easy-to-understand format (Thienthaworn, 2018). Journalism professionals and academics began to use the term data journalism widely in 2010 (Thienthaworn, 2018). However, the practice of processing data into information has been carried out since the 19th century. In Indonesia, several mass media, such as Harian Kompas (1965), Majalah Tempo (1971), and Majalah Prisma (1971), have been developing data journalism since decades ago for their news coverage, mainly from their election survey data in the 1970s. Their news organization also has research and editorial teams (Widiantara, 2021). In recent times, data journalism has witnessed significant advancements since its establishment in the early 20th century, thanks to the continuous innovation and evolution of journalists and newsrooms. A new possibility is opened for journalists as they can automatically gather information using computer programs, look for relationships between hundreds of documents using software, create attractive infographics to deliver complex reports and explain stories or news interactively (Bounegru et al., 2012). There are several online news outlets in Indonesia that have been developing data journalism, such as Katadata.co.id (2012), Beritagar.id (2015), and Tirto.id (2016). In 2018, Kumparan.com, CNBCIndonesia.com, and detik.com started to use data in their articles (Widiantara, 2021).

In 2003, Ashadi Siregar, a journalism lecturer at Universitas Gadjah Mada (UGM), Indonesia, mentioned that television journalists in Indonesia had a responsibility to address the growing issues of religious communalism, ethnic tensions, and the potential fragmentation of the nation in order to restore social order and cohesion in the public sphere (Siregar, 2003). He further stated that conventional media in Indonesia, including television, use digital technology to expand their information for the public. Nevertheless, the use of social media is more dominant among Indonesians, resulting from the emergence of the Industrial Revolution 4.0 and its accompanying technological advancements.

Under this circumstance, the Indonesian digital press tends to pursue advertisements

driven by the number of clicks, ignoring the rules of journalism that serve audiences by providing factual and objective information (Siregar, 2003). On the other hand, Kencana and Djamal's research in 2020 revealed that Narasi TV applies online journalism principles consisting of brevity (concise news), adaptability (ability to adapt in presenting news report), scannability (can be scanned or easily accessed by the public via a website), interactivity (reader interactivity by providing feedback columns via the site), as well as community and conversation (readers can act actively and open up space for discussion (Kencana & Djamal, 2021). The Katadata.id researcher, Adek Media Roza, argued that data journalism in Indonesia found its momentum around 2014. It became a new genre of journalism expected to reduce hoaxes and strengthen public trust in mainstream media by producing data-backed works (Roza, 2020).

The usual reporting process involves various sources, witnesses, blogs, and social networks (Bounegru et al., 2012). Therefore, data journalism is essential for collecting, filtering, and visualizing events that are more than they appear. Working with numbers, data sets, public records, and visualizations is important for news agencies today because data provides journalists with reporting tools to elaborate on social complexities (Lewis, 2021). Data journalists need some tools to create content in digital forms, including text, statistics, and audiovisual materials, e.g., photos and videos (Hahn & Stalph, 2018) This practice is in line with what is done by Tempo, one of the reputable media in Indonesia. Based on the research results conducted by Asprilla and Maharani (2019), the application of data journalism practices at Tempo is carried out through several processes: collecting, cleaning, contextualizing, combining, and communicating data to the audience (Asprilla & Maharani, 2019). Even this media does the same thing with their fact-checking practices to avoid the spread of misinformation and disinformation (Hanifah & Monggilo, 2022; Monggilo, 2019a).

Practically, digital investigative journalism also applies to open-source intelligence (OSINT) work. OSINT is increasingly driven by the Internet and ICT-based technological developments, which historically have been used in news and information agencies. Open-source projects offer equal contributions (Lewis & Usher, 2013). One of the key structural characteristics of open-source projects is leaning toward a collective interest for the greater good (Lewis & Usher, 2013). Narasi Newsroom implements this method in the making of Buka Mata content. In the era of data openness and the Internet, this type of intelligent method can be helpful for journalists. Big data from the government, organizations, communities, and even individuals can be accessed freely on the Internet. Journalists can use open-source tools to collect, filter, and visualize their investigative reports. Open-source culture aligns with normative technology values, such as transparency, iteration, tinkering, and participation (Lewis & Usher, 2013).

The story idea of data journalism is almost the same as traditional journalism. Journalists can make reactive or proactive story ideas (Bradshaw, 2018). Reactive story ideas encourage traditional journalists to catch up on recent events, such as disasters, demonstrations, government announcements, etc. As for data journalists, reactive story ideas are carried out by responding to the latest statistical data released by the government or displaying the big picture of the data issued by the government (Bradshaw, 2018). In contrast, the idea of proactive stories comes from an agenda put forward by journalists, and editors encourage journalists to seek information based on that agenda (Bradshaw, 2018). Journalists use social media to seek the reflection of public opinion (McGregor, 2019). Journalists can also

access public uploads on social media, which can be used in news reports (McGregor, 2019). On the other hand, data journalists are more likely to set a news agenda than follow it (Bradshaw, 2018). This means that journalists can show the multiple sides of an event.

According to Mutsvairo (2019), the advancement of data journalism in non-Western countries faces a significant challenge due to the absence of guaranteed journalist safety and press freedom by the state, which can lead to threats of journalist criminalization. Conversely, in Western countries, data journalism serves as a crucial tool to prevent the abuse of power by those in authority (Mutsvairo, 2019). Lehren (2018) highlights that data journalism plays a pivotal role in exposing crimes and capturing human interests. Mutsvairo (2019) also argues that the definition of data journalism should incorporate the local ethos and consider the development of the local culture. Access to data should empower journalists and citizens, enabling them to fight tyranny and explore new strategies for resistance (Mutsvairo, 2019). This is in line with the research results of Steele (2018), which found that one of the ideologies of journalism in Indonesia is the struggle for justice and protection of the weak. Journalists in Indonesia support independent media against tyranny, especially after the collapse of the New Order authoritarian government in 1998. Steele (2018) argued that the goal of Indonesian journalists to expose corruption among the political elite might be similar to the "watchdog" journalism in the West.

Methods

This study uses a constructivist paradigm and a descriptive qualitative approach, which aims to produce descriptive data, written or spoken, from people and observable behavior. The case study research method of Robert K. Yin. This method is relevant for analyzing contemporary social phenomena and answering the research questions "how" and "why" (Yin, 2017). Also, this method matches the research questions posed in the issue formulation. In addition, the question is more explanatory because it is used to track operational processes over time (Yin, 2017). This study aims to show how Narasi TV produces Buka Mata videos that have OSINT in them by identifying its data and interviewing the creator. The case study method is applied without the researcher's control over the subject or event to be studied through direct observations and interviews with the parties involved (Yin, 2017). This research project was conducted from January to November 2021. We analyzed 19 of Buka Mata's news video content Narasi produced from late 2019 until mid-2021. The in-depth interviews were conducted with the Head of Narasi Newsroom (25 March), the producer of "Buka Mata" (7 June), and the Coordinator of the Narasi Newsroom Researcher (14 August). Each interview took about an hour.

Furthermore, we conducted a literature study from documents archives related to the research object and subject to complement the primary data of this study. We used the findings from the literature studies to corroborate the interviews' results. Researchers also use the interview moments to clarify the findings of the content analysis of Buka Mata's contents that contain OSINT data such as geo-intelligence, geospatial tools like maps etc. and social media intelligence. We use OSINT concepts to differentiate between Buka Mata containing in-depth interviews and in-depth open data.

Results

This study found that the practice of data journalism in Narasi Newsroom was done collaboratively by two teams: a content production team and a technical production team. The content production team consists of producers, reporters, and researchers, while the technical production team comprises video journalists, camera personnel, video editors, and animators. The content production

team is responsible for finding ideas or concepts, deciding on the news point of view, interviewing people, making a storyboard or script, and giving a reference about content visualization. Also, they need to explain how the script should be visualized. The technical team production will make the visualization based on the storyboard created by the content production team.

However, the team structure of Buka Mata production is slightly different from the general structure at Narasi Newsroom. This team consists of two producers, a reporter, and one camera person, who also works as an editor if needed. The characters of the two producers in Buka Mata are different. One producer has expertise in OSINT reportage, and the other has strong community ties. Nevertheless, one of the producers dominates the production processes. He has all the skills to make Buka Mata content, from data research to video editing. The production team or the investigation team at Narasi has special authority to determine ideas or concepts and the source to be interviewed. This production team holds meetings internally because the issues they discuss are confidential. The following statement reflects the internal situation of Buka Mata's team.

> "Buka Mata has a team, which is like an investigative team, and they cannot be disturbed. It has two producers, one reporter, and currently only one video journalist, but maybe there will be another soon." (L. Laisila, personal communication, March 25, 2021).

Buka Mata's content production process

There are three steps in making Buka Mata content: pre-production, production, and post-production. In the pre-production step, the producer determines the issue, does research, and writes the script. He will observe the topic from various sources, whether from a particular informant, discussions with people or groups of people, or social media, especially Twitter. After finding several public issues, he will choose one based on several considerations. First, the topic must be workable and achievable. Second, the impact of the news content should be agreed upon by the producer. Third, visualization of the issue to simplify the report for the audience should be workable and achievable. The key to selecting the topic is public interest. After determining the topic or concept, the producer will inform the Head of Narasi Newsroom or the Chief Editors. As a supervisor, the Head of Narasi Newsroom will check the complete script using a holistic or helicopter view before implementing the storyboard in the following production flow process.

The skills of data journalists and methods applied in Buka Mata

Since the producer of Buka Mata is a professional journalist familiar with research, the produced scripts are similar to video essay scripts. Therefore, the scripts consist of fruitful information. A video essay is an essay in a video form. The term video essay is challenging to define because it continues to develop throughout the long cinematic history (McLaughlan, n.d.). Based on our observation in several videos on Narasi TV, Vox, and the New York Times, video essays combine various media, such as images, audio (voice-over, music, sound), and text, to learn or analyze specific topics. A video essay generally has a structure similar to a text essay, including an introduction, body, and conclusion. The script writing method is captured in the following statement.

> "The script for the coverage of Buka Mata is the same as writing an essay in text. The script will be denser. There must be much information included because we are used to doing research." (A. Hanifan, personal communication, June 7, 2021)

The Buka Mata producer is an experienced journalist who has written an in-depth report and implemented the data-based investigation. He argued that curiosity and the journalist sense are essential in applying data journalism and the OSINT method. He further argued that many tools could be used to create an open-source investigation, but the central core of OSINT reportage is the journalist's curiosity.

Each of Buka Mata's contents is treated differently. In every production level, the number of human resources, data obtaining methods, and the data in every topic are different. At this level, producers, reporters, and sometimes researchers obtain the data from web scraping, interviewing people, and footage from various open source or news agencies that Narasi subscribes to. There are at least three OSINT methods applied by the producer, namely social media intelligence (SOCMINT), geographic intelligence (GEOINT), and signal intelligence (SIGINT), as shown in the following statement.

> "There are three OSINT methods that I usually use. First is geo-intelligence, geospatial tools like maps, imaging, etc. Second, SOCMINT, social media intelligence, in the context of profiling people, background-checking, and searching for accounts on social media. Third, SIGINT, signal intelligence, which is related to the context of communication, for example, radio, HT radio." (A. Hanifan, personal communication, June 7, 2021)

Open-source intelligence (OSINT) is part of all-source intelligence, including human intelligence, imagery intelligence, and signal intelligence (Defense Intelligence Agency, 1996). The source of OSINT can be divided into six categories: media, Internet, government and public data, academic and professional publication, commercial data, and grey literature (Richelson, 2018). The media sources include national or international newspapers, magazines, radio, and television. Besides, Internet sources include all online publications, blogs, media netizens, social media, and public documents. On the other hand, government reports, press conferences, financial documents, and official sites can be categorized as public data from the government. Meanwhile, the academic and professional sources consist of journals, conferences, symposiums, academic articles, theses, dissertations, etc. Then, several commercial data can also be used, such as satellite pictures from technology companies similar to Google Maps and Apple Maps, databases, and financial and industrial assessments. Furthermore, the grey literature contains technical reports, preprints, paperwork, business documents, unpublished work, patents, and bulletins (Richelson, 2018). The following statement summarizes the diversity of the sources.

> "There are lots of research data sources, (for example) data sources from government sites, from social media, and various sites. Data sources will be very diverse" (A. Hanifan, personal communication, June 7, 2021)

In addition to the interview data, the content of Buka Mata videos relevant to the research was also observed. The result shows that 19 Buka Mata content consists of the OSINT method. The list of these contents can be viewed in Table 1:

OSINT in "Buka Mata" contents

Based on our observation, Buka Mata's content mainly consists of open and public data rather than closed data. The secure data, in this case, is obtained from Narasi's collaboration or partnership, including smartphone movement data from the start-up company Lotadata or pictures from news companies such as Reuters and Antara, which can only be collected through

Table 1.
"Buka Mata" Videos using OSINT

No	Date	Title	Link
1	18 December 2019	*Omong Kosong Perdagangan Karbon di Borneo*	https://www.YouTube.com/watch?v=tJ2Utsg6Uqg&list=PL-zpqfQW17PwqpnLZg2ImhCcq7ZE0dbBo&index=47
2	8 January 2020	*China Memang Kuat di Laut China Selatan*	https://www.YouTube.com/watch?v=simLCPV0BHw&list=PL-zpqfQW17PwqpnLZg2ImhCcq7ZE0dbBo&index=45
3	14 January 2020	*Tipu Daya China Kepada Rombongan Indonesia di Kamp Uighur*	https://www.YouTube.com/watch?v=6YPcJsZfTew&list=PL-zpqfQW17PwqpnLZg2ImhCcq7ZE0dbBo&index=44
4	13 February 2020	*Virus Corona Mengintai Pulau Bali*	https://www.YouTube.com/watch?v=gtYrBuFpWfA&list=PL-zpqfQW17PwqpnLZg2ImhCcq7ZE0dbBo&index=43
5	28 March 2020	*CEROBOH DI CIANJUR: Jejak Buram Pemerintah Menangani Pandemi COVID-19*	https://www.YouTube.com/watch?v=WJpBqfwDHsA&list=PL-zpqfQW17PwqpnLZg2ImhCcq7ZE0dbBo&index=42
6	7 April 2020	*Jejak Awal Keluar Masuk Virus Corona di Indonesia*	https://www.YouTube.com/watch?v=0PtEHbqMuPc&list=PL-zpqfQW17PwqpnLZg2ImhCcq7ZE0dbBo&index=41
7	13 May 2020	*Berhasilkah PSBB Jakarta? Data Pergerakan Ponsel Berbicara!*	https://www.YouTube.com/watch?v=9Asgjv87WmI&list=PL2VXOB_zPEPyrFlpRfNpIibx2Z5AXqG2o&index=38&t=97s
8	22 June 2020	*Melacak CCTV-CCTV di Sekitar Rumah Novel Baswedan*	https://www.YouTube.com/watch?v=7wkgXgcX3I0&list=PL-zpqfQW17PwqpnLZg2ImhCcq7ZE0dbBo&index=35
9	16 July 2020	*Para Terduga Pengintai Rumah Novel Baswedan: Profil dan Jejak yang Tertinggal*	https://www.YouTube.com/watch?v=TlwEBXnZFHA&list=PL-zpqfQW17PwqpnLZg2ImhCcq7ZE0dbBo&index=37
10	21 July 2020	*Ini Penyebab Joko Tjandra Sulit Ditangkap di Luar Negeri*	https://www.YouTube.com/watch?v=Mo5Qp7iRDng&list=PL-zpqfQW17PwqpnLZg2ImhCcq7ZE0dbBo&index=36
11	22 July 2020	*Eddy Tansil Ada di China, Hartanya Makin Berlipat Ganda*	https://www.YouTube.com/watch?v=i2UYqWnJGS4&list=PL-zpqfQW17PwqpnLZg2ImhCcq7ZE0dbBo&index=35
12	19 September 2020	*Mengapa Data dan Angka Kasus Positif di Indonesia Diragukan?*	https://www.YouTube.com/watch?v=31qR_eqAOdo&list=PL-zpqfQW17PwqpnLZg2ImhCcq7ZE0dbBo&index=31
13	11 October 2020	*Di Balik Prosedur Pengesahan UU Ciptaker*	https://www.YouTube.com/watch?v=bKh_kCbQTrE&list=PL-zpqfQW17PwqpnLZg2ImhCcq7ZE0dbBo&index=30
14	28 October 2020	*62 Menit Operasi Pembakaran Halte Sarinah*	https://www.YouTube.com/watch?v=Pfjjn0dk_iA&list=PL-zpqfQW17PwqpnLZg2ImhCcq7ZE0dbBo&index=30
15	7 January 2021	*Kebocoran Data Kemenkes Ungkap Kejanggalan Angka Pandemi*	https://www.YouTube.com/watch?v=3Yli2_Inv7M&list=PL-zpqfQW17PwqpnLZg2ImhCcq7ZE0dbBo&index=27
16	1 February 2021	*Petaka Liburan dan Pilkada: Saat Pasien Membludak, Rumah Sakit Kolaps*	https://www.YouTube.com/watch?v=fJJIPgI-qn0&list=PL-zpqfQW17PwqpnLZg2ImhCcq7ZE0dbBo&index=25
17	18 March 2021	Why some Indonesian Citizens Still Believe the C-19 Pandemic Is a Conspiracy?	https://www.YouTube.com/watch?v=bMPNrOZPhM0&list=PL-zpqfQW17PwqpnLZg2ImhCcq7ZE0dbBo&index=20
18	21 April 2021	*Bagaimana Strategi Propaganda Online Kelompok Teror di Indonesia? Ini Penelusurannya*	https://www.YouTube.com/watch?v=Nwynhl53I40&list=PL-zpqfQW17PwqpnLZg2ImhCcq7ZE0dbBo&index=18
19	4 May 2021	*Penyidik Disuap, Operasi Penangkapan Bocor, Sampai Skandal Ketua KPK yang Tak Terungkap*	https://www.YouTube.com/watch?v=h_dMhj9IhRA&list=PL-zpqfQW17PwqpnLZg2ImhCcq7ZE0dbBo&index=16

Source: Author modification (2021).

subscriptions. On the contrary, the open data within the context of Buka Mata refers to various sources such as journals, public websites, social media, official government sites (parliament, local government, central government, or foreign government), in-house media, public media in every state, and Non-Government Organization (NGO) reports. Also, open data can be derived from Google as a technology company, such as images captured by their satellite (Google Earth, Google Maps, or Google Street View).

Buka Mata with GEOINT

The Buka Mata team also processes the geospatial information-based intelligent method. Based on Indonesian Law Number 4 in 2011 about geospatial information, geospatial is a spatial aspect that shows the location or the position of objects or events underneath, on, or above the earth that are declared in the particular coordinate system. Geospatial Intelligence/GEOINT refers to the collection, analysis, and dissemination of imagery and geospatial information to describe, assess, and visually depict physical features and geographically-referenced activities in the air, land, maritime, and space domains (Australian Geospatial-Intelligence Organisation, 2021).

The Buka Mata video titles which use the GEOINT method are *Omong Kosong Perdagangan Karbon di Borneo*, *China Memang Kuat di Laut China Selatan*, *Tipu Daya China Kepada Rombongan Indonesia di Kamp Uighur*, *Melacak CCTV-CCTV di Sekitar Rumah Novel Baswedan*, *Para Terduga Pengintai Rumah Novel Baswedan: Profil dan Jejak yang Tertinggal*, and *62 Menit Operasi Pembakaran Halte Sarinah*. The video titled *Omong Kosong Perdagangan Karbon di Borneo* combined digital and field investigation. Buka Mata's team used satellite images from Google Earth. Based on the satellite imagery, Narasi could show several problems in the Katingan Project, from the protected forest from forest fires to land disputes with the indigenous people in the Center of Kalimantan. When the team came to the location and saw the lines made by the indigenous people, they marked the coordinates at that location. After that, coordinate points are reviewed and compared with the protected forest area through the Google Earth image.

A video called *China Memang Kuat di Laut China Selatan* consists of reportage about China's defense power in the South China Sea. In January 2020, there was tension between Indonesia's and China's governments because several fisherman ships followed and were protected by the China Navy. Their coast guard took the natural resources from the Indonesia Exclusive Economic Zone around North

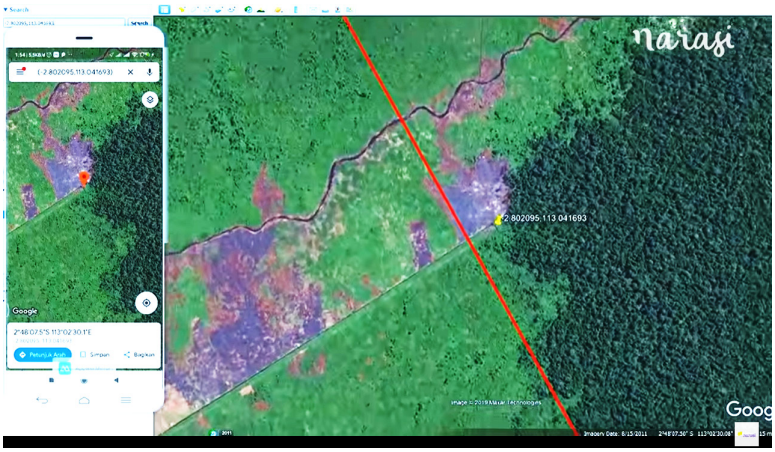

Figure 1. The coordinate data of the boundaries of the customary forest area and the Katingan Project forest observed using Google Earth satellite imagery.
Source: Buka Mata's video entitled Omong Kosong Perdagangan Karbon di Borneo (2020)

Figure 2. Satellite image from Google Earth to show China's military bases in the South China Sea islands

Source: Screenshot from China Memang Kuat di Laut China Selatan video (2020)

Natuna (Purba, 2020). Narasi investigated the China Navy's power in the South China Sea by collecting information about their defense equipment and military base. They obtained information about China's defense equipment from the Center for Strategic and International Studies (CSIS) research center and China's public media, the China Global Television Network (CGTN). Narasi also showed China military bases through satellite images from Google Earth and maritime information sources: Indo-Pasifik CSIS and the Asia Maritime Transparency Initiative (AMTI).

Google Earth satellite images were also used in a video called *Tipu Daya China Kepada Rombongan Indonesia di Kamp Uighur*. Narasi produced a report uncovering previously undisclosed aspects of the Uyghur camp in China. The Chinese government had selectively withheld this information from visiting Indonesian journalists and clerics, who had been invited by the Chinese government to witness the conditions within the Uyghur camp firsthand. Narasi verified the location they visited using the geolocation method to verify the places they stopped by. Buka Mata's team verified that by comparing photos and videos uploaded by the Indonesian visitors in the Uyghur camp on their official media with satellite images. Then, the team showed satellite images that revealed the camp conditions before the Indonesian visitors came. This step aims to show the audience the differences or reconstructions in that location before the journalists came and saw the camp condition.

The images or video verification can be implemented through the geolocation browsing method. The geolocation method covers using all available tools to confirm the location of a picture or image (Higgins, 2018). This method often includes satellite images found in various sources, such as Bing Maps, Google Earth, Google Maps, and Terraserver (Higgins, 2018). Panoramio and Google Street View are the field images where the location sets are often used (Higgins, 2018).

The images above show how Buka Mata's team verified the locations a group of people from Indonesia visited in the Uyghur camp. Those images were taken by Kumparan's journalist or a video uploaded by NU Channel, and they compared these pictures and videos with Google Earth's satellite images. Then, Narasi shows the satellite image from the exact location each year before the Chinese government invited people from Indonesia to show the difference between Uyghur camp conditions several years ago and when they came.

Figure 3. A video clip from the NU Channel account on YouTube (right side) compared with the Google Earth satellite image (left side) by Buka Mata's team

Source: Author documentation (2021)

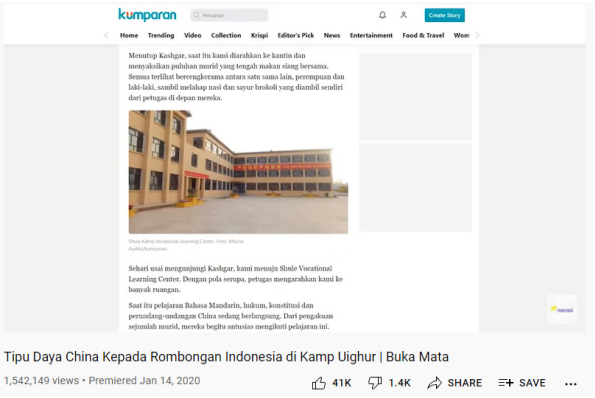

Figure 4. A picture taken by a journalist from an Indonesian online news outlet, Kumparan, which became the first data source of Buka Mata's team

Source: Author documentation (2021)

Narasi also optimizes pictures from Google Street View as their investigation tool. For example, in a video called *Melacak CCTV-CCTV di Sekitar Rumah Novel Baswedan* and *Para Terduga Pengintai Rumah Novel Baswedan: Profil dan Jejak yang Tertinggal*, Narasi used the Google Street View images to find the location of closed circuit television (CCTV) around the neighborhood of Novel Baswedan, an ex-officer of *Komisi Pemberantasan Korupsi* (KPK) (Indonesia anti-corruption commission), who became a victim after two strangers poured a dangerous chemical liquid into his face on the way home from praying at a mosque near his house. By showing the location and the amount of CCTV near Novel's house, the Buka Mata's team countered the police's claims of checking all the CCTV in that neighborhood. Some of the Novels' neighbors who installed CCTV at their house argued that the police never came to ask for their CCTV video recorded. In addition, the Buka Mata's team also implemented a geolocation method to verify the picture that became evidence shown by the police and Novel himself at Mata Najwa TV show discussing a theme called *Para Terduga Pengintai Rumah Novel Baswedan: Profil dan Jejak yang Tertinggal*.

Aside from using open-source satellite images from Google, Buka Mata's team also utilizes Bali Tower CCTV videos. This company serves telecommunication infrastructure tower that collaborates with the government of DKI Jakarta province. In the *62 Menit Operasi Pembakaran Halte Sarinah* video, the Buka Mata's team investigated some suspects who burned the TransJakarta Sarinah's shelter. They compared videos from Bali Tower CCTV with hundreds of videos publicly uploaded by social media accounts, such as Instagram, Twitter, YouTube, and TikTok.

Buka Mata with SOCMINT

The team implemented GEOINT and SOCMINT methods. Also, they used geolocation techniques to arrange the chronology of people burning the Sarinah bus shelter when a riot called *#TolakOmnibusLaw* happened on October 8, 2020, in Jakarta. They also crawled the data from the Internet and analyzed the metadata from hundreds of videos on social media. By checking the metadata of a video, the team can reveal the time when the photo or video was taken. Furthermore, the geolocation technique can be used to verify the location, allowing the organization to see a chronological sequence. Social media intelligence (SOCMINT) is a technique and technology that allows someone, an organization, or a community to observe social media networking sites (Wood,

Figure 5. Narasi using the geolocation technique to match the picture with the exact location through Google Street View

Source: Author documentation (2021)

2017). SOCMINT is also called an open-source social media intelligence (OSSMInt). This technique and application involve the analysis and exploration of open-source social media data to extract information that is investigable or potentially valuable (Agarwal, 2017). SOCMINT includes all tools to gather, maintain, and analyze social media data and interpret those data into trends and analysis (Wood, 2017). This technique is implemented by monitoring messages, images, or other types of data uploaded or shown on social media. The information sources include person-to-person, person-to-group, or group-to-group interactions (Wood, 2017). The methods also vary, such as manually observing contents when uploaded on a public group or website, observing the user request or searching history, monitoring activity or content types uploaded by users, and scrapping and replicating content that can be accessed directly (Wood, 2017).

The first step of observation that the Buka Mata's team did was by analyzing a picture taken by a journalist from an online media Merdeka.com. Then, the team looked for a person who captured that picture on every single source, whether on social media (TikTok, Twitter, and Instagram) or publicly accessible CCTVs. As a note, from September to February 2021, Narasi opened a News Collaborator internship program. During this time, the apprentices were involved in several production processes at Narasi Newsroom, including the Buka Mata content. In collecting hundreds of TikTok videos, the team was assisted by five interns at Narasi Newsroom. According to one of the interns, each intern searches for a hundred TikTok videos using various action-related hashtags, for example, #TolakOmnibusLaw.

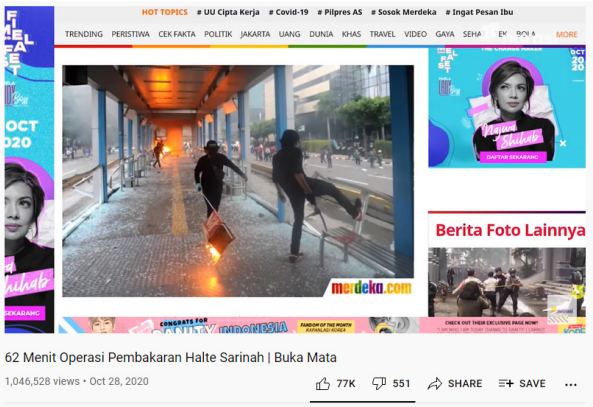

Figure 6. The Picture by Merdeka.com journalist that became the reference for the Buka Mata's team

Source: Author modification (2021)

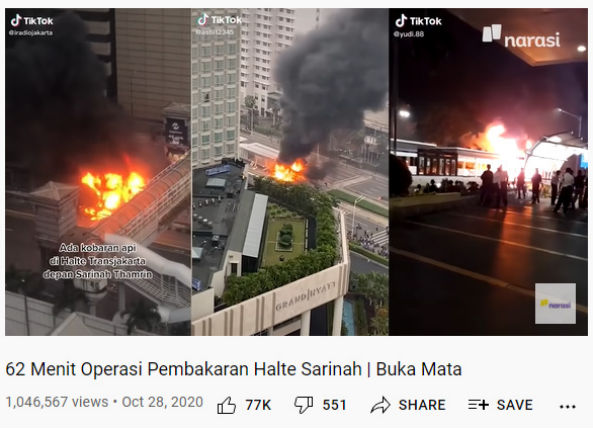

Figure 7. A collection of TikTok videos analyzed and processed by the Buka Mata's team.

Source: Author modification (2021)

To ensure the upload time of the collected TikTok videos, the apprentices also track the video metadata through the inspect element

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feature in a web browser. The upload time is tracked from the metadata because the TikTok application does not display the upload time in detail (only the date and month, without hours). By carrying out this tracking, the team verified that the TikTok user who uploaded the video was at the scene when the bus stop burned. The observation results also show that the team collaborated in creating investigative content. The producer explained that his team collaborated with NGOs, the media, and start-ups. After collecting all data and information according to the storyboard or script, the video editor will edit the video and create graphic images in the post-production stage. Oftentimes, the producer also acts as the video and graphic editor. The Narasi Newsroom Content Manager explained that when video content was almost ready, the manager and editor would conduct a preview to determine whether or not the content was appropriate for broadcast across Narasi platforms.

The presentation of the Buka Mata content

The presentation of digital investigative content in Buka Mata varies, depending on the theme. Content containing GEOINT displays mostly satellite imagery or images of the location of the coverage object. Meanwhile, OSINT content that utilizes open-source documents is presented in various ways. Almost all content contains public images or videos, but some combine public images or footage from these open sources with illustrations or animated images. The producers of Buka Mata stated that their content drew inspiration from the news coverage by various media outlets, such as Vox and The New York Times. Vox is a reference for creating video essay content in Buka Mata.

The majority of content incorporates digital investigative methods that rely on open data, specifically utilizing visualizations derived from a collection of public videos. Most videos used are digital data or information that the public can access. Mainly, the sources of coverage data, whether images, videos, or text, come from public media, government websites, NGOs' white papers, journals, start-ups' publications, and social media content. In addition to videos from open or public sources, Narasi also uses footage from two news agencies it subscribes to, such as Reuters and Antara. In the content of *62 Minutes of Sarinah Halte Burning Operation*, for example, the videos came from TikTok, Balitower CCTV, Instagram, YouTube, Reuters, Tempo, and Polda Metro Jaya's Public Relations. Apart from that, there is also content that utilizes data from applications made by start-up companies. One of them is the video of *Is PSBB Jakarta Successful? Mobile Phone Movement Data Talking!* which uses Lotadata's application as one of the visual materials. To ensure the authenticity and correctness of the images or videos used, Narasi Newsroom always double-checks by comparing images and videos from various sources to prove that the videos being examined are the same as those from other sources.

The Buka Mata's verification practices align with social media content verification principles. There are at least four principles of social media content verification (Monggilo, 2019b). First, the authenticity of social media content must be verified by ensuring it originates from authentic and official figures, groups, or institutions. Second, the sources cited within the content should be directly confirmed through detailed information or specialized software. Third, the time of content publication is crucial, and attention should be paid to the upload date to ensure it is not delayed or outdated. Lastly, the location information associated with the content needs to be checked for accuracy and validity.

While still containing public video footage, the visual theme of Buka Mata's content varies. Journalists must think creatively in creating audio-visual content, especially OSINT coverage which makes journalists

think and work extra (Utomo, 2020). The video *Di Balik Prosedur Pengesahan UU Ciptaker* used Among Us game visuals, which was popular from mid until the end of 2020. This video traces the documents of the House of Representatives (DPR) meeting on the DPR's official website (dpr.go.id). Apart from that, the team also interviewed several DPR members. After collecting and conducting interviews, all data is packaged in visuals inspired by the game Among Us. A video entitled *Mengapa Data dan Angka Kasus Positif di Indonesia Diragukan?* on September 19, 2020, published a combined report, both on-site and open data coverage. The team conducted a report from the Pondok Ranggon Public Cemetery, Jakarta. This report also contains Narasi research results from various sources, data from the Ministry of Health on death rates from COVID-19, interviews with the WHO Director for the Southeast Asia region Prof. Tjandra Yoga Aditama, and the spokesperson for the COVID-19 Task Force Team, Prof. Wiku Adisasmito. Data visualization uses bar graphs, line charts, and illustrations of people and analogizes the number of deaths due to COVID-19, equivalent to the capacity of Maguwoharjo Stadium.

Even though the visual presentation differs, every content always contains a voice-over. Reporters read scripts or scripts compiled by producers. The producers try to show the footage according to the text or narration in the script so that the information presented is accessible to the audience. The practice carried out by the team aligns with the visual storytelling concept written by (Radü, 2018) in the book Digital Investigative Journalism. The multimedia era has changed how journalists work, especially digital TV journalists. In the past, almost all young TV journalists were taught to show, not tell, or the jargon is "show, do not tell," but in the current multimedia era, the realization of this rule has changed to "show and tell," because there is an opportunity for online journalism to make

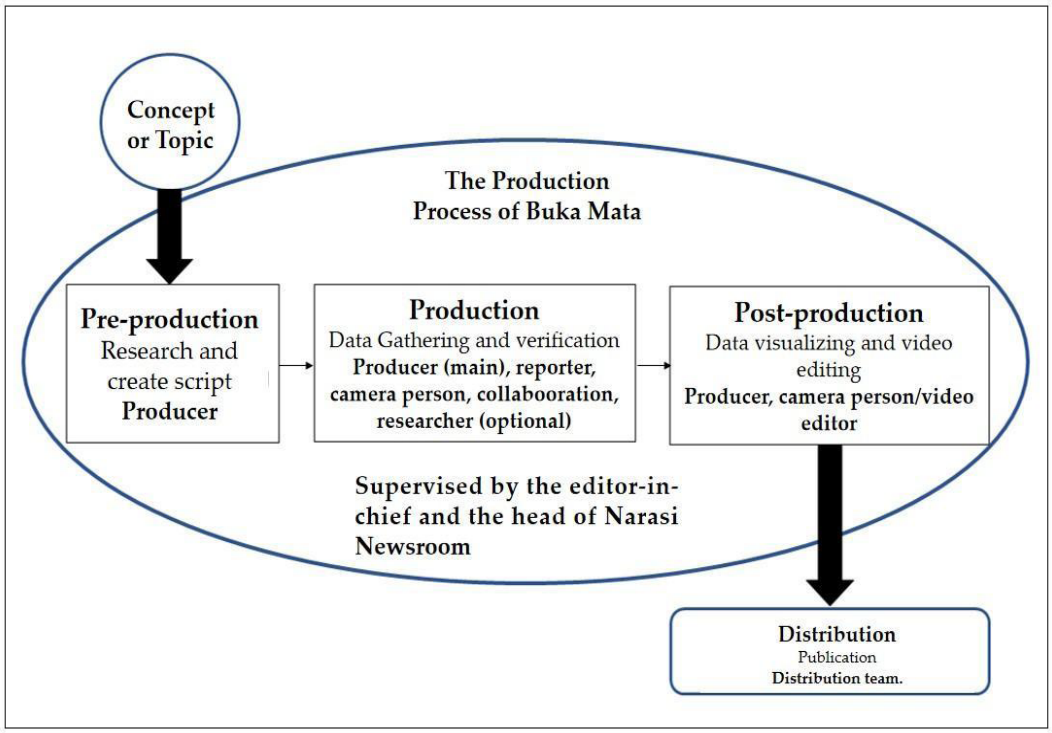

Figure 8. "Buka Mata" Production

Source: Author modification (2021)

every reporter a broadcaster, publisher, even a radio station since the advent of smartphones (Radü, 2018). Audiences are used to discovering events in a multidimensional form, so the combination of text, film, photos, graphics, or 360-degree videos becomes one multimedia experience (Radü, 2018). Once the video is edited, the Content Manager and Editor-in-Chief will review the video before distribution. The content will be uploaded after obtaining the manager and editor-in-chief's approval.

Based on the results of data collection and analysis, a chart of the general Buka Mata content production process can be drawn as follows:

Discussion

Even though Narasi TV has implemented data journalism practices in making the "Buka Mata" news video, there are several challenges Narasi Newsroom faced in optimizing data journalism coverage. The first is the limited number of human resources. Second, Narasi still needs to maximize audience participation. The third is the issue of press freedom in Indonesia.

Narasi TV has conducted data journalism practices using various tools and data sources, collaborating with international media or start-ups to produce in-depth and investigative news coverage. However, from the content production side, the program still needs more human resources. According to the producer, one of the problems in Buka Mata's team is that data journalism reports rely on producers. Meanwhile, reporters must have adequate ability or skills in compiling data journalism reports, primarily digital investigations. This condition sometimes causes delays in the production of the data-based digital investigation video of Buka Mata. Even so, Narasi Newsroom has proven that Indonesian journalists can apply the OSINT method inspired by the investigative practices of Western media. Narasi Newsroom demonstrates the potential for adopting international media publications in the context of local news to enhance the visualization of data journalism in Indonesia.

Another challenge is the need for more audience participation in the Buka Mata's news video production. In this context, audience participation entails providing input for coverage ideas and contributing to the collection of open data. Some of the data in Buka Mata still uses secondary data, such as the results of surveys from other institutions and images or videos that were used as footage. Buka Mata had previously networked with the Mata Kita community to make coverage, but the content was canceled (A. Hanifan, personal communication, Juni 6, 2021). The team can utilize networks, communities, NGOs, and the public to create crowdsourcing-based coverage. This way, Narasi TV can obtain raw data to increase media credibility. Crowdsourcing is a collaborative data collection method that involves large audiences, whether paid or not. Crowdsourcing journalism is an act that explicitly invites a group of people to participate in making news reports through various contributions, for example, voting, testimony, personal experience, unique expertise, etc. (Onuoha et al., 2015). To do this, the media can also work with NGOs by creating a crowdsourcing interface (Bounegru et al., 2012).

Another problem in data journalism in Narasi Newsroom is press freedom, which has yet to be achieved in Indonesia. Journalism coverage of digital investigative data can risk the freedom and safety of journalists in Indonesia. On multiple occasions, authorities in Indonesia have classified in-depth news coverage and investigations published by the media as hoaxes or fake news (Parahita & Monggilo, 2021). In addition to being labeled as hoaxes, journalists and media organizations have also been subjected to cyber-attacks. (Monggilo, 2020). Narasi TV journalists also experienced

simultaneous hacking and attempted hacking in September 2022. The hacking occurred from logging in to social media accounts to creating clone accounts using the victim's identity (Fajarlie, 2022). Although the exact reasons for the simultaneous hacking incidents targeting Narasi TV workers remain unclear, these incidents prove that press freedom in Indonesia is not safeguarded.

The Alliance of Independent Journalists recorded at least 14 digital attacks against journalists and media cases from 2020 to May 2021, consisting of eight doxing cases, four hacking cases, and two distributed denial-of-service (DDoS) cases (Manan & Ningtyas, 2020). Journalists can use big data to uncover crimes that affect the lives of billions of people worldwide, for example, organized corruption or criminals who have access to certain information (Bounegru et al., 2012). Investigative journalists must expose crimes and stop corrupt and criminal acts (Bounegru et al., 2012). Nevertheless, numerous media outlets in Indonesia, including Narasi TV, have faced limitations in exposing crimes and effectively combating corrupt or criminal acts.

The condition of press freedom in Indonesia also causes data journalists to be less flexible in working on investigative reports. Vast amounts of data are currently accessible by anyone connected to the Internet. However, at the same time, corrupt officials in government or organized crime groups do their best to hide information that could expose their wrongdoing or criminal acts and stir conflicts or crises in society (Bounegru et al., 2012). Hence, it becomes imperative for investigative journalists to uncover these mistakes, disrupting corrupt and criminal mechanisms (Bounegru et al., 2012). Several media in various countries have even collaborated with or employed hackers in their newsrooms to make investigative reports (Bounegru et al., 2012). This view is reflected in the following statement.

> "Not all journalists agree with that (OSINT method -ed). Because OSINT sometimes crosses legal limits, too, because that is what it was developed for. Narasi can do that (hacking to get data secretly). Even though it will never be done because the Press Law still makes it difficult to publish it." (F. Kurniawan, personal communication, Agustus 14, 2021)

The Narasi's team is also capable of collecting closed data on the Internet. However, according to the Narasi Research Coordinator, achieving this objective remains challenging due to the limitations imposed by the Press Law, which prohibits data collection through hacking or unauthorized access to closed sources.

Conclusion

The research findings show that Narasi TV has created data-based in-depth news videos in social media format using the OSINT method called Buka Mata as a sign of data journalism practice in digital media in Indonesia. However, this research found that the investigative data journalism news produced by Narasi Newsroom adapted to the conditions of press freedom in Indonesia and local audiences. The producers of Buka Mata employ the OSINT method of data journalism to create in-depth reports that include investigative processes based on digital data. Buka Mata contains an explainer type of writing and an essay video format. The Buka Mata's team operates independently, choosing themes beyond the scope of major editorial meetings, and devotes their focus to producing the Buka Mata report. The producers have qualified research experts, enabling them to handle dense and rich structured and unstructured data derived from big data sources akin to video essays. Most of the data used in the content is open data that can be accessed by the public and sourced from social media and official government websites.

However, some of the data is also the result of the team's collaboration with other institutions, such as the media, NGOs, and the community. The journalists also collect independent data, such as web scraping or collecting hundreds of videos on social media for processing. As explained in the conceptual framework and theoretical basis of this research, journalists who make data journalism reports must search, collect, monitor, analyze, and present data in a format that is easy for the audience to understand. All the aforementioned aspects were done to make a Buka Mata investigation coverage. The main strength of data journalists in the program is research. Although many tools are available, the journalist's curiosity and sensitivity are the primary keys to reporting data journalism. Journalists for the program are not only required to be able to collect, verify, and process data but also visualize the data that has been processed so that the public can easily understand the overall narrative and form. Several challenges, both internal and external, have caused the practice of data journalism in Narasi Newsroom to be suboptimal. From an internal perspective, Narasi Newsroom, especially the Buka Mata program, still needs more human resources. In addition, the abilities or skills of journalists in Buka Mata are not evenly distributed. From the external side, freedom of the press in Indonesia does not allow journalists or the media to produce investigative reports or data journalism, which is ideal for exposing criminal acts and pinpointing perpetrators. This issue needs to be resolved so that investigative coverage by the media in Indonesia, including the coverage of Buka Mata produced by Narasi TV, can genuinely carry out the function of the press as the fourth pillar of democracy, i.e., watchdog.

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