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THE DILEMMA OF ADOPTING INNOVATION IN MEDIA: STUDY CASE OF DATA JOURNALISM PRACTICE IN KOMPAS

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ABSTRACT

Using Everett M. Rogers' diffusion of innovations theory, this paper analyzes how an innovation, such as data journalism, which comes out as a result of digital disruption is being adopted in the newsroom of a national media in Indonesia, KOMPAS. The presence of digital disruption which leads to the mushrooming of contents provided by non-journalists creates challenges for journalists. Data journalism with its core of accuracy and fact-based information comes as a solution for providing quality and solutions based journalism as believed by KOMPAS. The case study of KOMPAS involves interviewing its six media practitioners to find out elements of diffusion innovation theory, such as the characteristics of innovation, decisions-making process, and category of adopter, applied at KOMPAS to examine the factors behind the process of adoption of data journalism in its newsroom. This research shows that the adoption of innovation (data journalism) in a mainstream media like KOMPAS is heavily influenced by the decision to adopt the innovation by a powerful individual such as editor-in-chief, the alignment of the innovation with the company's value and needs, the familiarity of its employee with the new method of journalism and a measured output.

1. Introduction

The utilization of data and computers to assist journalists in reporting in Indonesia has been rapidly increasing. The presence of digital disruption has pushed traditional media to adapt and adopt new ways for surviving in the changing environment. Awareness to produce a qualified product of journalistic starts to arise. One of the contributing factors is the mushrooming of content creators and irresponsible information spreading in the digital world. As a result, journalists are obliged to find ways to differentiate themselves.

One of the ways that could help journalists to produce qualified journalism that will outshine them to content creators is to immerse in data journalism. One of the media in Indonesia that decides to pursue that path of data driven storytelling is KOMPAS. This national media, established by P.K. Ojong and Jakob Oetama 57 years ago, created special teams to focus on providing quality journalism to society. As a result, a team specifically focused on data journalism was founded in 2021 (D. Sutta, personal communication, October 10, 2022).

Data journalism is not a new thing in Indonesia. Long before KOMPAS implemented data journalism, the concept of journalism that relies on data has been familiar in Indonesia since the 2010s. In 2016, for example, the Alliance of Independent Journalists, or also known as AJI, along with Indonesian Network for Investigative Journalism (JARING), One Data Indonesia and the Office of the Presidential Chief of Staff (KSP) hosted Indonesia Data Driven Journalism in which journalists were trained to utilize data from government to promote transparency in data (M. Adi, personal communication, September 29, 2022).

Besides AJI and JARING, other organizations like Indonesian Data Journalism Network (IDJN) and Journocoders Indonesia have also been actively participating in providing training to journalists on data journalism (Z., Wan Ulfa Nur, personal communication, October 5, 2022). Journalists, then, learn not only to utilize spreadsheets to analyze datasets and make visualization but also to use other more advanced tools like D3.js, QGIS, and other computer-based programs. Around that period of time, the practice of data journalism can be found in several media in Indonesia, such as Bandung-based printed newspaper Pikiran Rakyat, the online portal Katadata.co.id and Tirto.id, as well as in local media like Zona Utara and Terakota (M. Adi, M. Annisa, G. Irma, personal communication, October, 2022). Data journalism then becomes an innovation for the newsroom especially when facing digital disruption.

Skog et al. (2018) mention that digital disruption happens when the old established environment is challenged or disturbed by the presence of something new in the digital world. This condition leads to a rapid change of the established system through digital process. During a situation of digital disruption, companies or firms often need to respond to the prompt change (Skog, Wimelius, Sandberd, 2018). Digital disruption in media comes in the form of digital platforms. The research of Mutiara and Priyonggo (2019) shows digital disruption in Indonesia has caused a disturbance in printed media in terms of the decline of revenue. As a result, media innovates itself by changing format into digital platforms and adopting other forms of innovations.

According to Rogers (2003), innovation refers to 'an idea, practice, or object that is perceived as new by an individual or other unit of adoption.' Meanwhile, Wani and Ali (2015) argue in their research that innovation is not always 'new or recent in origin, rather it can be an erstwhile idea or object that a user perceives to have an unexampled use'. Related to this case, data journalism can be considered an innovation if it is perceived and accepted as something new by the people in the media.

People create innovations and spread as well as communicate those innovations to others or among members of society, or what is called as a diffusion process (Rogers, 2003). Diffusion creates a modification in 'the structure and function of a social system' as latest ideas are 'being adopted or rejected', as quoted from Rogers (2003). Diffusion of data journalism in the newsroom has caused a change within its editorial structures and function. The change of structures can include the merge of several departments to produce a collaborative data-driven journalistic product. For function, it can be related to putting data journalism as the solution for providing quality and solutions journalism to the public.

The diffusion process within media can be examined by using Everett M. Rogers' diffusion of innovation theory. Furthermore, a French sociologist Gabriel Tarde examined and talked about the theory in 1903 (Toews, 2003, as cited in Kaminski, 2011, p.1) in which he presented the S-shaped diffusion curve. The S-shaped curve shows the different types of innovation adopters such as innovators, early adopters, early majority, late majority, and laggards classified according to time (Kinnunen, 1996). Besides seeing the importance of the S-shaped curve for observing the diffusion of innovation, Tarde (in Kinnunen, 1996) also highlights how the decision-making process is also influential in the process of diffusion.

Rogers (2003) stated in his book entitled The Diffusion of Innovation Theory that research on the diffusion of innovations had been developed before he wrote his book on a similar topic. The previous research had shown findings such as an S-shaped curve that followed the diffusion of an innovation. Those who sit in the innovators' category would also have higher socio-economic status than other adopters in the category of innovation adopters (Rogers, 2003).

Rogers stated that diffusion refers to a process where innovation has been distributed and spread through certain communication channels between members of a social system. The adoption of the innovation then happens when two or more people exchange information about the innovation and persuade others to form actions such as accepting or rejecting the innovation. Meanwhile, innovation refers to 'an idea, practice, or object,' that is recognized as something new by 'an individual or other unit of adoption' (Rogers, 2003).

Rogers (as cited in Kaminski, 2011) explains that the diffusion of innovation happens when people adopt a new 'idea, product, practice, philosophy,' and others. This theory is often used as a valuable change model for an innovation of technology where the innovation would be modified to fulfill the necessity or needs of the adopters. Communications and social networks are considered important during the process of the diffusion of innovation.

The diffusion innovation theory, according to previous research, has been used in many research fields, such as Anthropology, Sociology, Education, Public Health and Medical Sociology, Marketing, Geography, and Communications. The latter field has analyzed news events and used other data collection methods such as survey interviews and statistics analysis for the research on the diffusion of innovation (Rogers, 2003). The results vary from the characteristics of the opinion leaders in the diffusion process, the adopters' category, the stages of the communication channel during the innovation-decision process, to the diffusion networks.

Based on the theory, Rogers (2003) stated four main elements of diffusion of innovation. Those four elements include innovation, communication channels, time, and the social system. The diffusion of innovation theory divides the characteristics of innovation into five, such relative advantage, compatibility, complexity, trialability, and observability. Meanwhile, the communication channels are divided into intrapersonal and mass media. Time consists of the type of adopters, innovation adoption process (innovations-decisions), and rate of adoption. The social system refers to people who deal with innovation. These people could be workers, an environment, or a country (Rogers, 2003). However, this research will limit its scope only to see the diffusion of innovation at KOMPAS according to the innovation (innovation characteristics) and time (innovations adopters, and innovations-decisions making) elements.

Previous research on a similar topic of data journalism and diffusion of innovation was conducted by Shuling Zhang and Jieyung Feng (2018). This research 'A Step Forward?

Exploring the diffusion of data journalism as journalistic innovations in China,' focuses on how the data journalism practice has been applied in the non-western newsroom, like in China. The researchers also examine contributing factors to the diffusion of data journalism practice in newsrooms in China. To achieve their goal, the diffusion of innovation theory was applied. According to the researchers, this theory has often been used as a theoretical framework for a study on technology innovation in newsrooms, such as the usage of computers or the convergence in newsrooms. However, studies on data journalism practice as a part of innovation itself have been lacking.

The research of Zhang and Feng uses the same theory of diffusion of innovation used in this study. However, it does not discuss and explore the category of adopters of the innovations. It only highlights how the diffusion of innovation has been implemented in online media in China and analyzes the limiting or triggering factors of the diffusion of data journalism in China. Meanwhile, the current study focuses on the characteristics of innovations, the decision-making process, and on the category of adopters in one media in Indonesia, which is KOMPAS.

Another study that uses diffusion of innovation theory was also conducted by Cindy Royal (2013) in her paper titled "Interactives of Olympic Proportions: The Diffusion of Data Journalism' in the New York Times". Royal analyzes the diffusion of data journalism practice in one media in the States, which is the New York Times (NYT). NYT has a similar condition with KOMPAS, in terms that this media had been in printed newspapers and due to the digital disruption needs to transform itself into a multiplatform one. In her study, Royal analyzes specifically the data visualization and graphs produced by NYT, especially on three Olympic reportages: the 2008 Beijing Olympics, the Winter Olympics in Vancouver, and the 2012 Summer Olympics in London. Furthermore, Royal uses a quantitative method by analyzing the content of the graphs to answer how far the presentation of graphs at NYT is, the implementation of interactivity, and the usage of data in NYT graphs.

Despite using the same theory of diffusion of innovation, Royal's research limits its study on the diffusion of innovation at NYT's visualization data or graphs products. The theory was used to see the interactivity concept in a media website. Meanwhile, this study focuses on one of the biggest media players in Indonesia, KOMPAS, and intends to see the adoption and diffusion of data journalism practice at KOMPAS. This study will not limit its analysis to the data visualization products but to the implementation of the overall data journalism practice at KOMPAS.

If two previous studies analyze media in China and States, the third research conducted by Muhammad Badri (2017) focuses on the innovation (data journalism) happening in media in Indonesia. The paper, which entitled 'Inovasi Jurnalisme Data Media Online di Indonesia' or the innovation of data journalism at online media in Indonesia, highlights on how the innovation of data journalism is being done in three online media in Indonesia. This study uses content analysis method and analyzes 15 news from three online media (Katadata.co.id, Tirto.id, and Beritagar.id) as a sample to measure the data journalism concept (data source, data visualization and writing) applied in the news. Despite analyzing the implementation of innovation (data journalism) in media in Indonesia, Badri's study does not use the diffusion of innovation theory which is explored in this paper.

All in all, the purpose of this research is to analyze the adoption of innovation (data journalism) at KOMPAS media, as one of the biggest media in Indonesia, based on Rogers'

diffusion of innovation theory. The diffusion will be examined under elements of innovations (characteristics), and time (category of adopters, and decisions-making process).

2. Method

This research uses a descriptive qualitative method approach where the researcher conducts interviews to several informants to gather the data and applies the information using the theory chosen for the research. According to Bungin (2010), descriptive qualitative research is used to describe and summarize conditions in all situations or various phenomena of social reality within society. Furthermore, this method will turn the reality into a characteristic, nature, model, signs or portrays of specific conditions, situations or phenomena.

In a descriptive qualitative research, the researcher will use a case study method. Bungin (2010) explains that the case study aims to focus the observation of the phenomena on a specific unit so it will result in an in-depth research. The case study, in a descriptive qualitative research, can be applied to a very small amount of data sources (e.g. one person, one family, one neighborhood, one village, one district, one province, one country and one continent). In this research, the researcher chooses KOMPAS, as one of the biggest media in Indonesia with enormous modality, as the single unit to apply the case study method.

To gather information, the researcher will use a gradual interview method. According to Bungin, this method of interview allows researchers not to engage in the life of the informants. Furthermore, the interview can be done in an in-depth model or not, depending on the core problems that will be asked by the researcher. The informants for this qualitative research include the Editor-in-Chief at KOMPAS daily, Sutta Dharmasaputra, the General Manager of Litbang division at KOMPAS, Ignatius Kristanto, the head of the investigative and data journalism teams at KOMPAS Billy Khaerudin, the coordinator of the data journalism team at KOMPAS Puteri Rosalina, the data journalist at KOMPAS Satrio Pangarso Wisanggeni, and the visual manager at KOMPAS Pandu Lazuardy Patriari. Meanwhile, for the data analysis technique, this research will follow Yin's pattern matching model. According to Yin (2018), a researcher will come up with a proposition created before the data collection. Descriptive qualitative research can match with this technique when the proposition precedes data collection (Yin, 2018). The proposition in this research is created based on Rogers' diffusion of innovation's theory and it is matched with the interview findings from the informants.

3. Results and Discussion

a. Dominant Characteristics of Innovation that is Influential to the Adoption at KOMPAS

Data journalism, refers to the term coined by Rogers, is included as an innovation in KOMPAS daily. Journalists have started to use data driven approaches in storytelling for only one year (D. Sutta, personal communication, October 10, 2022**)**. A consistent application of data-driven storytelling can be found in KOMPAS daily after the formation of a special team of data journalism in 2021. Before this year, KOMPAS had not produced any data driven journalistic products. Thus, the application of data driven storytelling and the formation of a special team of data journalism can be considered as innovation as it is something new that has never been practiced before in the KOMPAS newsroom.

According to Rogers (2003), the rate of adoption of innovations are influenced by several variables, including characteristics of innovations, type of innovation-decisions, communication channels, nature of the social system, and extent of change agents' promotions efforts. The first variable which influences the adoption of an innovation have five characteristics which include relative advantage, compatibility, complexity, trialability, and

observability, that are useful to predict the rate of adoption of an innovation. Relative advantage is the variable related to whether the innovation is perceived to be more advanced than the used method. This variable is not always counted from the economic factor, but could also be considered from other factors, such as prestige, social, comfortability, and satisfaction (Rogers, 2003).

At KOMPAS, the practice of data journalism is valued as superior to the previous method of journalism being implemented in the newsroom. Thus, its editor-in-chief, Sutta Dharmasaputra, decided to form a special team of data journalism in 2021. There are several reasons why the practice of data-driven storytelling is considered more advanced. First, the data journalism method of combining reportage with the utilization of data, especially real-time data, is different from the method of data collection that KOMPAS has done so far (D. Sutta, personal communication, October 10, 2022). Before fully implementing data journalism in the newsroom, KOMPAS founded a research division called Litbang in 1981 as the demand from the editorial team to have more archives and documentation (K. Ignatius, personal communication, October 7, 2022).

> *When the demands from the editorial started to be increasing, Litbang was founded in 1981 by Pak Widodo. Litbang recruited several initial researchers who helped the newsroom by providing some research. But the team was so small, only a few people. The first publication that this department produced was related to a research project with a university in Taiwan.*

Litbang is also in charge of KOMPAS' research center, which focuses on creating a database based on phone surveys from respondents all over Indonesia. Litbang publishes three articles for the research column at KOMPAS.id, an online version of KOMPAS printed newspaper, every day (K. Ignatius, personal communication, October 7, 2022). Though using data for research, Litbang does not produce data-driven reportage. Thus, the formation of the special team of data journalism provides something new and with better reporting techniques as it is combined with the utilization of data as said by Dharmasaputra (2022).

> *KOMPAS already has Litbang which plays with data…but I told our colleagues that big data and real-time data have emerged. In the future, survey based data probably will be disrupted… . I see that data journalism combines newsroom, journalists, and researchers. Data journalism has a big role to see problems and predict the future…. And so, it would be better if we create one small unit of data journalism.*

Second, KOMPAS was trying to find ways to face the ongoing digital disruption, especially in the form of the mushrooming content creators on the internet. Utilizing data journalism which focuses on accuracy and facts or data based stories can differentiate journalistic products from other non-journalistic products (D. Sutta, personal communication, October 10, 2022).

Thus, the relative advantage of data journalism is related to its superiority with the previous practice of journalism in the editorial team.

Besides this relative advantage, another variable of innovations influences the rate of adoption including compatibility. Compatibility is related to whether the innovation is consistent with the existing values, past experiences and the needs of the potential adopters (Rogers, 2022). The more aligned the innovation with the existing values and norms, the faster the innovation is being adopted. At KOMPAS, the dominant factor causing data journalism to

be implemented is that data journalism can be a tool for journalists to produce an added value, which is quality, as KOMPAS at the same time wants to elevate its journalistic products to be more qualified (D. Sutta, personal communication, October 10, 2022). Compatibility of its adoption, thus, is aligned with KOMPAS current needs to produce a Quality Journalism.

> *If data journalism methodology is being developed to its full capacity, journalism will strengthen its roles and we [Kompas] have product differentiation, in the form of Quality Journalism.*

To produce qualified data-driven journalistic products, journalists need to have the skills and knowledge of data and computer tools. The implementation of data journalism in KOMPAS newsroom is also supported by its journalists' existing abilities and knowledge on data and computer programming tools. In terms of complexity, the members of the data journalism team have been familiar with data-driven reportage. The adoption of data journalism at KOMPAS runs well (low complexity) as the journalists in the data journalism team have either used data for research or tools to analyze data. The data journalism team consists of three people: Puteri Rosalina the coordinator of the data journalism team, and two data journalists named Satrio Pangarso Wisanggeni and Albertus Krisna. Before joining the data journalism team, Rosalina worked at the research division or Litbang KOMPAS. However, she had done reporting and written features for the Metro and Humaniora desk (R. Putri, personal communication, September 12, 2022). Meanwhile, Wisanggeni has an education background majoring in English Literature and Information Technology so he has been familiar with using computer programming tools and languages like *R Studio*, *ArcGIS* and *API* to analyze various kinds of data (P. W. Satrio, personal communication, September 14, 2022). As for Krisna, his Linkedin profile shows that he had worked previously, before joining with KOMPAS, as a researcher and Geospatial Information System (GIS) analyst, roles that are relevant and beneficial to be a data-driven journalist. Khaerudin (2022) mentioned that the idea to combine journalists and researchers to be in the data journalism team came from the current editor-in-chief.

> *Mas Sutta (editor-in-chief) thought that data journalism should have support not only from the editorial but also from Litbang. Therefore, two Litbang researchers joined the data journalism team.*

To produce a data-driven journalistic product, the data journalism team needs to collaborate with the graphic team. Pandu Lazuardy Patriari, the visual manager at KOMPAS visual department, said that the graphic team had been familiar with infographics long before data journalism was being implemented at KOMPAS. Though the previous products of infographics are different with data visualization as it stresses more on the mixture between texts, illustrations and data not graphs, Pandu claimed that the visual team had been used with creating diagrams and graphs.

> *All desks have programs to do special reportage or regular reportage. They (the journalists) used to ask us to make infographics for them…. We are used to reading data stories and are familiar with the rules for making diagrams and graphs, the do and don'ts.*

However, the data journalism team also faces some challenges in terms of familiarity. First, each member of the data journalism team has never produced data-driven storytelling before the creation of the team. Thus, they have to find and explore the collaboration dynamics among each other as well as finding the appropriate format of the data journalism product as stated by Rosalina (2022). Besides that, the graphic team needs to elevate their skills in reading data and to transform them to appropriate graphs (Patriari, 2022).

> *Because some data stories have many variables that are quite confusing. Some others are not. (Sometimes) we have difficulties in reading and translating stories that have many variables into visualization. So, we need to have a discussion first with the journalists.*

Related to trialability, Dharmasaputra (2022) said that before the formation of the data journalism team, he had asked the investigative team to use data for their reporting on water pollution. He claimed the result of that tryout was used as a vindicating factor to form a data journalism team. However, trialability does not have a big impact on the rate of adoption of data journalism at KOMPAS. The adoption is more influenced by the decision-making process, which will be discussed further in the next section. The editorial acceptance of the trial of data journalism is considered low as the journalists in the editorial team were taking a wait-and-see approach to data journalism practice. They also expected to see the outcome first from readers (D. Sutta, personal communication, October 10, 2022). Some factors that contributed to this include the feeling of unfamiliarity with the data analysis method and the tools and the uncertainty of readers' acceptance (K. Ignatius, personal communication, October 7, 2022).

b. Decision Process in Adopting Data Journalism Practice in KOMPAS

In the process of adoption, decision-making has become one important variable in impacting the speed of innovation adoption (Rogers, 2003). Rogers (2003) divides the decision-making process into three types, such as optional, collective, and authority. Optional innovation decisions are influenced by independent individuals as the unit of decision making, collective is related to decisions of a group of people, and authority refers to the decisions made by individuals with 'power, status or technical expertise'. In authority decision-making, individuals who adopt the innovation act only as the doers of the adoption. At KOMPAS, the decision to employ data-driven storytelling is made solely by the editor-in-chief, or in other words, the type of innovation decision is authoritative and a must-do. In this case, the individual who decides and implements the decision of practicing data-driven storytelling in the editorial team is the editor-in-chief.

Sutta Dharmasaputra is now in charge as the editor-in-chief of KOMPAS daily's editorial team. He decided that KOMPAS created a small data journalism team in 2021 not long after he was appointed as the chief-in-editor. The team acts as the adoption unit which performs the decision made by the decision unit or the editor-in-chief. This small team of three people has an obligation to produce in-depth articles heavily based on data on one topic per month. Furthermore, the team usually creates up to eight data-driven articles per topic (R. Putri, personal communication, September 12, 2022). So far this data journalism team has produced several varied topics, such as college tuition fee, COVID-19, prices of houses, floods, fires, food waste, and transportation. Rosalina (2022) said that the team considered several factors to choose a topic to be further explored. One of which is proximity value. To know which topic is the most discussed by the public, she said the team relied on social media to observe the ongoing discussed topic by the public.

> *The issue is always something relatable and discussed by the public. To know, three of us (the data journalism team) often observe Twitter and other social media accounts to observe the currently discussed topic. Then, we will discuss the availability of the data related to that topic.*

Kristanto (2022) explained that the adoption of innovation was heavily dependent on the decision-maker, or the editor-in-chief.

> *It depends on the interest of the editor-in-chief as the decision maker. Mas Sutta (Kompas current editor-in-chief) has been newly appointed in 2021 but he already changes everything. (This huge change) It is his approach to face the massive disruption happening in the field of journalism. We need a new innovation and he sees that as the solution for that disruption.*

Dharmasaputra's decision to create a small unit of data journalism to produce consistently data-driven storytelling, in the beginning, did not invite good appraisal and acceptance from the editorial team. However, Kristanto (2022) said after the editorial team saw that the public response was huge to the data-driven products, there was a shift in attitude and perception from the editorial team (low level of observability). The low acceptance of the adoption from the editorial team is caused by the doubt of whether the journalists are able to do statistical analysis, data reading, and use computational tools in producing data-driven storytelling.

> *It was a bit of a compulsory thing to do (into data journalism) as ordered by the editor-in-chief. It's a must. The backbone (of the team) is from the Litbang team. Some researchers from Litbang were transferred to the data journalism team. It is okay… And it's true, the public's attention is huge and so it makes others (journalists at KOMPAS) become fascinated, too.*

Dharmasaputra (2022) said that this decision to create a small team of data journalism was taken due to the current challenge faced by the journalism industry. Data journalism, he believed, was 'a power that the newsroom can use' to differentiate journalism products from other non-journalistic products. The decision is a huge and bold move as KOMPAS is currently also impacted by the financial crisis experienced by the media industry especially during the pandemic. The 2020 survey released by the Union of Newspaper Publishers (SPS) as cited from Dewanpers.or.id shows a declining revenue (40%) of 71 pct media companies during the pandemic. As a result, media companies had to make strategic decisions ranging from reducing the income of its employees, reducing papers pages, to firing workers. Dharmasaputra explained the same condition was also experienced by KOMPAS. However, his vision to find solutions to the ongoing digital disruption experienced by the newsroom encouraged him to move forward and adopt the innovation.

> *KOMPAS' revenue is declining. One sure thing is that we cannot afford to be luxurious like we used to be. In the past, we had a lot of ads in line, but now it's not the same. New journalist recruitments are currently postponed and so the numbers of journalists are getting less and less. Senior journalists are retired but no new young journalists are hired. Looking at that situation, there is a question, if we produce data journalism and create this small unit, how will it be? But I believe that if we do not do this, we will do the same as what has been done by content creators.*

c. Data Journalism Adopter Categories in KOMPAS

Rogers (2003) stated that type of adopters have been divided into five categories, such as innovators (venturesome), early adopters (respectable), early majority (deliberate), late majority skeptical), and laggards (traditional). Each adopter has different attitudes and perceptions towards innovation.

Based on the categorization above, KOMPAS places the category as follows. First, in terms of adoption time, KOMPAS belongs to the late majority category. The adoption time is highly dependent on the highest decision maker or in the hand of the editor-in-chief. The appointment and formation of the data journalism team was done after KOMPAS' new editor-in-chief, Sutta Dharmasaputra, was appointed in the same year of 2021. Meanwhile, looking at the adoption year, the timeline for KOMPAS to adopt data journalism is considered as slow and late compared to other newsrooms in Indonesia. For example, the practice of data journalism has been found in the newsroom of Pikiran Rakyat newspaper in 2010, Katadata in 2012, Tirto.id in 2016, Beritagar in 2015, Zona Utara in 2017, and Terakota.id in 2017. Meanwhile, KOMPAS is considered as a big and mainstream media in Indonesia with more resources, better equipped technologies and modality but the adoption of data journalism in its newsroom has just started in 2021. Kristanto (2022) said that the term of computer-assisted reporting (CAR) and precision journalism had been introduced at KOMPAS in the 1990s. At that time, KOMPAS sent two researchers from Litbang to learn and study more about CAR and precision journalism in the Philippines and USA. None of the journalists were sent to study those new (at that time) methods of journalism.

> *All of them did not know how to do the new methods and did not have an interest in data analysis. They (the editorial team) often tried but the capabilities were not that strong. They need to have the passion to be able to do it (data analysis).*

When data journalism was implemented in the newsroom in 2021, it was more because of the decision of the editor-in-chief. Next, in terms of KOMPAS attitude to risk, this media fits with the late majority category. The newsroom has not been able to accept innovation in a fast manner especially when the output has not been measured. There is a sense of careful consideration when applying and adopting the innovation. It is shown by the acceptance from the editorial to the practice of data journalism after the data-driven products received a good response from the public (K. Ignatius, personal communication, October 7, 2022).

> *It's true after several times publishing (the data journalism articles), the public attention was so massive and it made other journalists get interested.*

Next, related to the view on technology, the nature in KOMPAS is to implement proven technology and innovation. This could be seen from the statement made by the General Manager of Litbang, Ignatius Kristanto. The enthusiasm from the editorial appeared when seeing the response of the public to the product of data journalism. After receiving good response and increasing interest from the editorial members, KOMPAS is currently planning to develop its data journalism team by adding one more team to increase the quantity of the data driven stories (K. Ignatius, personal communication, October 7, 2022).

> *Now, the team will be expanded. Currently, the data journalism team produces data driven reportage once a month. Our editor-in-chief suggested the team produce two times a month and thus will create one more new data journalism team due to the amazing response to the products.*

Meanwhile, Dharmasaputra (2022), said that KOMPAS could implement technology as it had equipment to develop the technology. However, challenges come from the human resources. He said that overall, the resources were not ready yet to utilize the technology.

> *So far we have done data analysis. For technology, it is still lacking. … For implementing technology only, it could be done to be honest. However, we haven't prepared the organization (the resources) to focus on utilizing and maximizing the utilization of technology. We are preparing one more step to go there.*

One of the data journalists at KOMPAS, Wisanggeni (2022) said that compared to the data journalism found in newsrooms outside KOMPAS, the implementation of data journalism at KOMPAS had yet to be advanced. Several factors became the reasons for this, such as the usage of conventional data rather than big data, the conventional methodology of analyzing data and the utilization of static data visualization rather than the interactive ones. He hoped that someday he could elevate his skills in coding; thus, analyzing more alternative and non-conventional data to differentiate KOMPAS' data driven storytelling products with other media companies. Related to the static graphs, Patriari (2022) said that static graphs were chosen due to the medium of the news, which is paper and electronic paper. Furthermore, readers, according to him, did not have the capacity to understand pure data visualization.

> *Space for visualization is limited for the printed pages, meanwhile making the interactive visualizations in the digital platform needs more effort and time. … . We tried to use the pure data visualization (without illustrations and only graphs) and it was approved (by the editorial team). However, along the way, sometimes graphics like that were not selling when being placed on the first page of the newspaper and so we often remake it again to be more interesting.*

If the problem with the utilization of the technology comes from the readiness of KOMPAS human resources, in terms of budget allocation, KOMPAS is prudent in nature. It means that KOMPAS is careful in allocating specific budgets for the improvement of technology and innovation. Based on the interview with several people, there had not been equipment especially provided for elevating the products of data journalism. Laptops sometimes could experience error when using specific applications for data analysis, data journalism workshops had been given but basic ones (data analysis and data visualization, no coding skills) and the journalists felt the need to learn more about non-conventional and programming based data analysis. Dharmasaputra (2022) said so far KOMPAS allocates a specific budget for the data journalism team, which covers the journalists' salaries, budget for reporting and budget for doing collaboration projects with others.

> *The coverage of eight data driven articles is so expensive, and also we spent money for collaborations with other institutions like Drone Emprit for data analysis. If we look closer, we spend a lot of money but it is not in line with the impact it creates. Subscribers and page views are still behind the in-depth stories. However, we still allocate money and see this as an effort to do data journalism literacy to the public.*

Next, related to attitude towards innovation, KOMPAS wants to implement an innovation with a measurable and certain output that could be seen physically by the editorial team. Dharmasaputra (2022) explained that data journalism had a huge role in spotlighting problems and predicting the future. However, since the competencies of journalists in producing data-driven storytelling is yet prepared for the new skills, the editor-in-chief decided to make a team of three first as an exemplary model. The acceptance came after the team showed that its data journalism products received good response from the public as well as from the government.

The wait and see attitude found in KOMPAS puts this media in the category of early majority in terms of its position in the media industry. The movement of data journalism implementation in KOMPAS is considered slow. When other media in Indonesia were already experimenting and using data journalism in their newsroom in the 2010s, a big and mainstream media like KOMPAS just started to launch its data journalism unit in 2021 and now is planning to use big data for analysis (K. Ignatius, personal communication, October 7, 2022). The result of the qualitative analysis on KOMPAS' type of adopter can be seen on Table 1 below.

Table 1. Summary of KOMPAS' type of adopter

Criteria	Description	Category
Adoption time	adoption time highly dependent on the hand of editor-in-chief (authority decision making) adopt data journalism in 2021, which is way behind other media that already started to implement data journalism in the 2010s adopt data journalism as an answer to find new ways to face the ongoing digital disruption (pressures)	late majority
Attitude to risk	do not accept and adopt innovation in a fast manner esp. when the output has not been measured (practical) have a careful consideration when applying and adopting the innovation	late majority

View on technology	implement proven technology and innovation resources (majority) are not ready to use the technology technology and methodology of data journalism is not advanced enough (non-coding skills, not interactive data visualizations)	early majority
Budget allocation	prudent in nature careful in allocating specific budgets to develop and adopt innovation allocate budget for data journalism team salaries, coverage and collaboration projects with other institutions	early majority
Attitude to innovation	wants to implement an innovation with a measurable and certain output **n**ot prepared with the innovation as the journalists' competencies skill need to be developed	early majority
Position in similar industry	the implementation and adoption of data journalism in KOMPAS newsroom is considered slow and steady	early majority

Source: personal communications

4. Conclusion

This qualitative research reveals the data journalism practice in mainstream media in Indonesia like KOMPAS is adopted by a careful and considerate approach as shown by the category of adopters. Based on all of the criteria in the category of adopters, which include adoption time, attitude to risk, view on technology, budget allocation, attitude to innovation, and position in a similar industry, KOMPAS never fulfills the requirements for innovators nor early adopters. The findings show KOMPAS positioned either in the early majority or late majority as the adoption is implemented due to pressures (challenge of digital disruption), adopting in a practical manner and not a risk taker nor wanting to popularize the trend of data journalism, utilizing innovation that is already proven and measured (reliable) output, prudent in nature in terms of budget allocation, and not in leadership in producing innovative data journalism products. Furthermore, the stage of diffusion is impacted mostly by compatibility, relative advantage, and complexity factors. The findings reveal data journalism is being adopted because of its compatibility with the company's need of producing quality journalism and facing the ongoing digital disruption, its low complexity in terms of the media already have the potential resources who have been familiar with data or tools in analyzing data, and the data journalism's relative advantage of being superior to the regular method of journalism and KOMPAS previous data and research division. Meanwhile, the trialability of data journalism does not influence the that much for the adoption unless the output has been measured. Despite the familiarity with data-driven products from the members of the data journalism team, other journalists are not familiar with this new method of reporting. This condition causes practicing data journalism to become challenging for other journalists in the editorial team (low observability). Furthermore, in mainstream media such as KOMPAS, the decision to adopt an innovation is heavily influenced by the decision maker. In this case, the decision maker at KOMPAS needs to be someone with a position or power to order the adoption of innovation (e.g. the editor-in-chief).

The limitation of this study is that it only uses several variables like type of adopters, innovation-decision making, and characteristics of innovation to analyze the adoption of data journalism practice in KOMPAS and it is done in a qualitative method. Thus, further study could be developed by using quantitative methods to measure the rate of adoption of innovation and could expand the variables in determining and finding the factors of the adoption of innovation.

References

Aitamurto, T., & Varma, A. (2018). The Constructive Role of Journalism: Contentious metadiscourse on constructive journalism and solutions journalism. *Journalism Practice*, *12*(6), 695–713. https://doi.org/10.1080/17512786.2018.1473041

Alvian Dwi Putranto, & Irwansyah. (2022). Mobile Journalism on News Production in Kompas TV. *Jurnal Spektrum Komunikasi*, *10*(3), 206-214. https://doi.org/10.37826/spektrum.v10i3.231

Arief, M., & Muthmainnah, A. N. (2022). Data Journalist : One Data Indonesia (SDI) Weak of Data. *Jurnal Spektrum Komunikasi*, *9*(2), 195-202. https://doi.org/10.37826/spektrum.v9i2.220

Audinovic, V. (2021). The Existence of Private Television in Convergence Media Era. *Jurnal Spektrum Komunikasi*, *9*(2), 140-151. https://doi.org/10.37826/spektrum.v9i2.160

Badri, M. (2017). Inovasi Jurnalisme Data Media Online di Indonesia. *Tren Pola Komunikasi Media Di Indonesia Tahun 2017*, 356.

Bungin, B. (2011). *Penelitian kualitatif: Komunikasi, Ekonomi, Kebijakan Publik dan Ilmu Sosial Lainnya* (Second edi). Kencana.

David Bornstein, T. R. (2021). *If We Can Report on the Problem, We Can Report on the Solution*. https://www.nytimes.com/2021/11/11/opinion/fixes-solutions-journalism-lessons.html

Rogers, E. M. (2003). *Diffusion of Innovations, 5th Edition*. Simon and Schuster.

Howard, A. (2014). The Art and Science of Data-Driven Journalism. *Tow Centre for Digital Journalism - a Tow/Knight Report*. http://towcenter.org/the-art-and-science-of-data-driven-journalism/

Kaminski, J. (2011). Theory in Nursing Informatics Column. *Canadian Journal of Nursing Informatics*, *6*(2), 1–7.

Kinnunen, J. (1996). Innovation diffusion research. *Scandinavian Sociological Association*, *39*(4), 431–442.

Martinisi, A., & Lugo-Ocando, J. (2020). *Statistics and the Quest for Quality Journalism*. Anthem Press. https://doi.org/10.2307/j.ctv17rvxf9

Mutiara, F., & Priyonggo, A. (2019). *Digital disruption in print media: challenges of convergence and business models*. *308*(Insyma), 206–209. https://doi.org/10.2991/insyma-19.2019.53

Olsen, G. R. (2018). *A new platform for quality journalism ? March*, 420.

Pers, D. (2020). *Wajah perusahaan pers cetak di masa pandemi Covid-19 pendapatan turun drastis, hingga merumahkan karyawan*. https://dewanpers.or.id/berita/detail/1581/Wajah-Perusahaan-Pers-Cetak-di-Masa-Pandemi-Covid-19-Pendapatan-Turun-Drastis,-Hingga-Merumahkan-Karyawan#

Sewchurran, A., & Hofmeyr, B. (2020). A critical reflection on digital disruption in journalism and journalism education. *Acta Academica*, *52*(2), 181–203. https://doi.org/10.18820/24150479/aa52i2/10

Skog, D. A., Wimelius, H., & Sandberg, J. (2018). Digital Disruption. *Business & Information Systems Engineering*, *60*(5), 431–437. https://doi.org/10.1007/s12599-018-0550-4

Vallance-Jones, F., & McKie, D. (2017). *The Data Journalist: Getting the Story*. Oxford University Press.

Vehko, J. (2010). What Is Quality Journalism and How It Can Be Saved. *REUTERS INSTITUTE for the STUDY of JOURNALISM*, 82.

Wani, T. (2015). Innovation Diffusion Theory Review & Scope in the Study of Adoption of Smartphones in India. *Journal of General Management Research*, *3*(2), 101–118.

Wu, S. (2022). Asian Newsrooms in Transition: A Study of Data Journalism Forms and Functions in Singapore's State-Mediated Press System. *Journalism Studies*, *23*(4), 469–486. https://doi.org/10.1080/1461670X.2022.2032802

Robert K. Yin. (2018). *Case Study Research and Applications Design and Methods Sixth Edition* (L. Fargotstein, E. Wells, C. Neve, K. DeRosa, & G. Dickens (Eds.); Sixth edit). https://doi.org/9781506336169

Zhang, S., & Feng, J. (2019). A Step Forward?: Exploring the diffusion of data journalism as journalistic innovations in China. *Journalism Studies*, *20*(9), 1281–1300. https://doi.org/10.1080/1461670X.2018.1513814

Zhang, X., & Chen, M. (2022). Journalists' Adoption and Media's Coverage of Data-driven Journalism: a Case of Hong Kong. *Journalism Practice*, *16*(5), 901–919. https://doi.org/10.1080/17512786.2020.1824126