

Data Journalism: How the Data is Visualized

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Abstract— The existence of data in modern journalism is necessary to present the objectivity of reporting to the public. Modern journalistic methods that rely on data obtained from creeping and biometric data allow journalists to write their news. Ensuring the accuracy of data is the main thing that journalists must ensure. The level of journalist literacy in matters relating to obtaining data from reliable sources and journalists' competence in data processing are mandatory requirements that must be met. This research presents one central question: how is data visualization in data journalism?

Keywords— *data journalism, big data, data visualization*

I. INTRODUCTION

The media are the primary source of creating public perceptions of an event that occurs in this world [1], so journalism in a democratic society has the task of not only presenting information but as a watchdog [2] [3] and exercising supervision of the activities of the state or public institutions [4].

The development of information technology has provided an abundance of big data [5] which the media can become a source of information in the form of digital data [6]. The use of big data is one of the main issues in the 4.0 industrial revolution, which connects to all fields of work, including the field of journalists [7]. "Adaptation" is the keyword for journalists to be able to take advantage of big data, and data journalism is born as a new instrument in digital information-based journalistic activities. *Data journalism* is the main ingredient in making stories and helps journalists create attractive visualization of information based on data.

The abundance of big data is a challenge for journalists [8] to take advantage of this, especially the ability to visualize such data in the form of information to the public.

If we have watched *Bandersnatch*, the famous *Black Mirror* series recently, of course, we are contemplating that life is not a free choice that can be determined just like that. The life adage is that choice is no longer the most fundamental right that Stefan Butler (Fionn Whitehead) has, where we as spectators have participated in the decisions he made.

Since the film begins, we begin to determine Stefan's life choices. Starting from the breakfast he eats, the music he wants to hear, and other choices that determine the life of the depressed teenager. Netflix, through *Bandersnatch*, gives us a different viewing experience.

Like Netflix, which provides a different viewing experience [9], data journalism (data-driven journalism) [10] also applies a different approach to enjoying journalism. This approach leads to various options for the audience in enjoying news, such as checking the accuracy of the information and presenting information through data visualization. The same thing is experienced by the journalist when doing news works.

Data journalism allows readers to check and test the accuracy of information. For example, in its application via online media, an article will lead readers to click on the hyperlink of the data used. Not only to verify the writing but also to test claims on developing issues. If the author does not provide a link to the data source, the author will usually list the instances where the data was obtained. The Central Bureau of Statistics (BPS), ministry data, or research results from non-governmental organizations (NGOs) are examples of institutions used as sources for data journalism. The freedom to test this information is the first option.

II. METHOD

The methodology in this study uses a literature review [11] approach that is described qualitatively with the primary source of information from relevant literature and in conclusion using inductive reasoning. Inductive reasoning is used to find out how data journalism works in data visualization. Furthermore, in general, the data collection and analysis methods are based on the concept of grounded theory [12].

III. RESULT AND DISCUSSION

Media errors occur when researching data on a story and visualizing information (presenting inaccurate data) so that the public consumes misleading information.

Based on the PRC report in 2012, the public began to change its trend in consuming news. Mainstream media has decreased the number of enthusiasts. The public is turning to digital sources of information that are easily accessible through their gadgets so that the media responds by integrating the form of its news into the digital realm (based on the online edition).

Not only revitalizing the form of the news, media, especially journalists, are required to be able to design data visualizations to be attractive. Initially, the data was only a set of numbers, then visualized into meaningful and interactive infographics. The types of data visualizations

used are column, line chart, pie chart, hierarchy, statistical, scatter plots, bar charts, bubble charts, and the word cloud.

The choice is not only given to readers in enjoying the news but also to journalists. In the past, in testing claims for information, journalists needed to interview the government or researchers, believe their opinions and quote them in writing. Now, through data journalism and the fast flow of information, journalists can compare the results of interviews with available data. Some newsrooms in Indonesia, such as Tirta, Beritagar, or Katadata, even provide data support to journalists, where journalists who cover in the field are assisted by a data team that provides information for verification.

Good data journalism also gives journalists the option to develop stories or visualize them through charts, maps, scatter plots, and various other visualization types. Some media provide a personal story approach to readers, while others want to present the latest visualization. There is nothing wrong with either approach, and they are both ways of conveying information.

A medium may produce in-depth data-based reports, which, of course, feel very personal to the reader. However, this type of report certainly takes time to process. The level of difficulty of the issues addressed also determines the length of time the report is processed. Furthermore, in-depth reports with robust data and personal stories do not appear every day.

Media companies also have another option, namely to raise the issue through another column. Hard news and mild articles can be an option. It is like the entrance to a big issue. In these two rubrics, the report processing does not take a long time and does not require a very personal approach.

Another option that is the reason for the updating of data journalism is the visualization of the data itself. Displaying the latest in visualization and technology is also an option in the storytelling process. Either they are using graphics, maps, gifs, animation, and other types of technology available. Then, just like newsrooms that emphasize a story approach, those who focus on visualization certainly have their own timeline and workflow. How many times do you want to create a visual story in a week, what type of writing is shown, and how many graphics are shown?

IV. CONCLUSION

The presence of new media has had a positive impact on two parties. First, for the media, creating new ways and techniques for presenting old-fashioned information towards digital information as well as a wider public/audience coverage because the dissemination model is online-based. Second, for the public/audiences, easy access to information anywhere and anytime. Another finding is that the data processed in visual form is an important concern for the editorial staff. Reliable data sources, careful sorting of data, and visual design skills are important parts of data journalism. A news or research result published through printed and electronic mass media requires an infographic not only as news exposure but also as an attraction of the media. The use of color, composition and other visual elements considers the uniqueness and uniqueness of a medium.

Through the infographics created, the printed and electronic mass media will be more easily recognized. Infographics are a creative way to clearly and quickly communicate information with graphs. Not only graphics but some compelling infographics also use diagrams, symbols, and illustrations. Infographics also function to provide pause. After being filled with a series of words, the reader is expected to be relieved for a moment when all of these can be represented by pictures. Infographics are viral because they help people get a message across. The message is illustrated with creative and attractive images, so the resulting infographic will be more eye-catching and easy for readers to understand. In a hectic era, fast and effective communication is, of course, advantageous.

From a business perspective, one definition of an infographic resonates above all. British graphic designer, writer, and information design theorist Nigel Holmes refers to them as "graphic explanations." Ultimately, data journalism makes us think, much like Bandersnatch's ideology. Who determines the trends and approaches of journalism in the future, whether the wants and needs of readers or journalists as story makers.

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REFERENCES

- [1] W. Lippmann, *Public opinion*, vol. 1. Transaction Publishers, 1946.
- [2] S. Coronel, "The role of the media in deepening democracy," *NGO Media Outreach*, pp. 1–23, 2003.
- [3] W. L. Bennett and W. Serrin, "The watchdog role," *Press*, vol. 169, p. 188, 2005.
- [4] M. Schudson, "The news media as political institutions," *Annu. Rev. Polit. Sci.*, vol. 5, no. 1, pp. 249–269, 2002.
- [5] R. Kitchin, "The real-time city? Big data and smart urbanism," *GeoJournal*, vol. 79, no. 1, pp. 1–14, 2014.
- [6] S. Kaisler, F. Armour, J. A. Espinosa, and W. Money, "Big data: Issues and challenges moving forward," in *2013 46th Hawaii International Conference on System Sciences*, 2013, pp. 995–1004.
- [7] A. Christin, "Algorithms in practice: Comparing web journalism and criminal justice," *Big Data Soc.*, vol. 4, no. 2, p. 2053951717718855, 2017.
- [8] S. C. Lewis and O. Westlund, "Big data and journalism: Epistemology, expertise, economics, and ethics," *Digit. Journal.*, vol. 3, no. 3, pp. 447–466, 2015.
- [9] M. Pittman and K. Sheehan, "Sprinting a media marathon: Uses and gratifications of binge-watching television through Netflix," *First Monday*, 2015.
- [10] Y. Zhou and Z. Zhou, "Towards a Responsible Intelligent HCI for Journalism: A Systematic Review of Digital Journalism," in *International Conference on Intelligent Human Computer Interaction*, 2020, pp. 488–498.
- [11] P. Cronin, F. Ryan, and M. Coughlan, "Undertaking a literature review: a step-by-step approach," *Br. J. Nurs.*, vol. 17, no. 1, pp. 38–43, 2008.
- [12] B. G. Glaser, "Conceptualization: On theory and theorizing using grounded theory," *Int. J. Qual. methods*, vol. 1, no. 2, pp. 23–38, 2002.