Data in Brief

 Scientists lists available at ScienceDirect

journal homepage: www.elsevier.com/locate/dib

Data in Brief

Article

CLICK-ID: A novel dataset for Indonesian clickbait headlines

Andika William, Yunita Sari*

Universitas Gadjah Mada, Indonesia

A R T I C L E   I N F O

Article history:
Received 26 June 2020
Revised 11 August 2020
Accepted 24 August 2020
Available online 27 August 2020

Keywords:
Indonesian
Natural Language Processing
News articles
Clickbait
Text-classification

A B S T R A C T

News analysis is a popular task in Natural Language Processing (NLP). In particular, the problem of clickbait in news analysis has gained attention in recent years [1, 2]. However, the majority of the tasks has been focused on English news, in which there is already a rich representative resource. For other languages, such as Indonesian, there is still a lack of resource for clickbait tasks. Therefore, we introduce the CLICK-ID dataset of Indonesian news headlines extracted from 12 Indonesian online news publishers. It is comprised of 15,000 annotated headlines with clickbait and non-clickbait labels. Using the CLICK-ID dataset, we then developed an Indonesian clickbait classification model achieving favourable performance. We believe that this corpus will be useful for replicable experiments in clickbait detection or other experiments in NLP areas.

© 2020 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY license.
(http://creativecommons.org/licenses/by/4.0/)

* Corresponding author.

E-mail addresses: andika.william@mail.ugm.ac.id (A. William), yunita.sari@ugm.ac.id (Y. Sari).

https://doi.org/10.1016/j.dib.2020.106231
2352-3409/© 2020 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY license.
(http://creativecommons.org/licenses/by/4.0/)
## Specifications Table

| Subject                  | Computer Science                                      |
|--------------------------|-------------------------------------------------------|
| Specific subject area    | Indonesian Language, Natural Language Processing, Text Classification |
| Type of data             | Text files                                            |
| How data were acquired   | By scraping online news websites                      |
| Data format              | RAW, Analysed, Filtered                               |
| Parameters for data collection | Articles were collected from the website's index pages of online news publishers. The data collected were the headline of the article, source publisher, published date and time, category, sub-category, and content of the article. Published date and time were separated into different columns. When a category or sub-category data is unavailable, it is left as blank. |
| Description of data collection | Articles were collected from a selected set of 12 Indonesian online news publishers with varying numbers. It was collected from each publisher using individual web scrapers. A sample of the articles, where the headlines are to be annotated, were then chosen accordingly from each publisher. In total, 15,000 sample headlines were annotated by undergraduate students into either clickbait or non-clickbait label. |
| Data source location     | Articles were collected at Universitas Gadjah Mada, Indonesia. |
| Data accessibility       | Repository name: Mendeley Data                        |
|                          | Data identification number: doi:10.17632/k42j7kpn.2    |
|                          | Direct URL to data: https://data.mendeley.com/datasets/k42j7x2kpn/1 |

### Value of the Data

- To our best knowledge, the CLICK-ID dataset is the largest clickbait dataset in the Indonesian language. It can provide a basis for further development on clickbait tasks in the Indonesian language.
- The CLICK-ID dataset is available in 3 versions that are based on the level of agreement between annotators which may help researchers to use more reliable annotations.
- In contrast with other clickbait datasets, the CLICK-ID dataset presents analysis on groups headlines based on their categories to give a perspective on how clickbait rates vary in different categories.
- The CLICK-ID dataset compiles headlines from 12 distinct online news media publishers and offers information to the common newsreaders of Indonesian media about which publishers have a higher tendency of publishing clickbait articles.
- The CLICK-ID dataset provides additional properties of the article. It can be extended for usage on various NLP tasks other than clickbait detection, such as text-categorization and training word embeddings.

### 1. Data Description

The CLICK-ID is a collection of Indonesian news headlines collected from 12 local Indonesian news publishers. The 12 publishers chosen are: detikNews, Fimela, Kapanlagi, Kompas, Liputan6, Republika, Sindonews, Tempo, Tribunnews, Okezone, Wowkeren, and Posmetro-Medan. The CLICK-ID corpus consists of 46,517 collected headlines that are divided into 2 groups, (i) 15,000 annotated headlines, and (ii) 31,517 non-annotated headlines. The annotated headlines are annotated with either clickbait or non-clickbait label, with the headline sentence serving as the only basis for judgment. Each headline is annotated by 3 annotators in which the majority is taken as ground truth. To offer a more thorough result of our annotation, we divided our annotated headlines into 3 files; main, all_agree, and does_not_agree. The main file contains the entire annotated dataset, whereas all_agree only contains headlines with annotations that were agreed by all annotators and does_not_agree only contains annotations with disagreements.
The files of CLICK-ID are available in 2 file extensions, comma-separated-values (.csv) and spreadsheet (.xlsx) file. It is stored in different folders with their contents corresponding to their folder names. In the repository, the CLICK-ID folder contains 2 folders; the raw folder and the annotated folder. Raw folders contain the original files that were generated as a result of the scraping process. On the other hand, the annotated folder contains the selected headlines that have been annotated.

All folders contain 2 folders of ‘csv’ and ‘xlsx’ which corresponds to the extension of the file inside. Files between these folders have identical contents. The files in the annotated folder differ in which they have an additional column for labels (‘label’ and ‘label_score’). The ‘label_score’ column in these files represents the same values as the ‘label’ column, where the clickbait label is represented as ‘1’ and non-clickbait as ‘0’. Furthermore, the spreadsheet files in the annotated folder contain 2 sheets. One with the labels and the other with the full details of the article (date, category, contents etc). There is also an additional folder named ‘combined’ in the annotated folder. It contains one main spreadsheet file along with the additional files of main, all_agree, and does_not_agree with (.csv) and (.json) extensions.

The details of the CLICK-ID dataset are highlighted in Table 1, where it was analysed using Microsoft Excel. Table 1 shows all the twelve publishers that were collected. In total, there are 46,119 articles collected (Article column), out of which 15,000 are sampled for annotation (Annotated columns). The 3 columns in the Annotated presents the results of our annotation. In total, our annotation shows there are 8710 non-clickbait and 6290 clickbait labels. Out of this total, annotations that were fully agreed upon (all_agree file) are comprised of 5297 non-clickbait and 3316 clickbait labels. In terms of reliability, our main dataset obtained a “moderate” inter-annotator agreement Fleiss’ K [3, 4] score of 0.42.

Clickbait headlines are detected in all publishers, with varying percentages. The distribution of the non-clickbait and clickbait headlines are visualized in Fig. 1. Here we see the different distributions of clickbait as presented in Table 1, in which it shows that detikNews have the lowest clickbait rate whereas wowkeren have the highest clickbait rate.

To analyze clickbait rates based on headlines’ categories, it is necessary to group the headlines first. However, since publishers use different category names, an attempt to group similar categories from each publisher was done. Namely, the categories from each publisher are grouped into one of the defined 9 Category Groups; News, Celebrity & Entertainment, Sports, Business & Economy, Lifestyle, Science & Technology, Otomotive, Religion & Culture, and Others. The details of which are presented in Table 2. Remaining categories that do not fit into any of these groups are classified into an additional Category Group ‘Others’. The results of this grouping are shown in Table 3 shows the number of clickbait headlines of the combined articles belonging to the category group across publishers. Fig. 2 illustrates the distribution of clickbait headlines and comparison across Category Groups. This shows that the Business & Economy and News cat-

| Publisher | Articles | Non-annotated | Annotated (total, non-clickbait, clickbait) |
|-----------|----------|---------------|------------------------------------------|
| detikNews | 5468     | 4468          | 1000 890 110                              |
| fimela    | 788      | 88            | 700 306 394                               |
| kapanlagi | 1006     | 6             | 1000 603 397                               |
| kompas    | 3243     | 1743          | 1500 1157 343                             |
| liputan6  | 4581     | 3081          | 1500 613 887                               |
| okezone   | 4664     | 3164          | 1500 741 759                               |
| posmetro  | 307      | 7             | 300 71 229                                |
| republika | 5782     | 4282          | 1500 1267 233                             |
| sindonews | 3572     | 2072          | 1500 1215 285                              |
| tempo     | 4026     | 2526          | 1500 1118 382                              |
| tribunews | 9662     | 8162          | 1500 451 1049                              |
| wowkeren  | 3020     | 1520          | 1500 278 1222                              |

| Total     | 46119    | 31119         | 15000 8710 6290                           |

*posmetro-medan is referred as posmetro
to analyze clickbait headlines based on their categories, they first need to be grouped. Since publishers have different category names for similar topics, the CLICK-ID dataset groups headlines into 9 general categories.

### Table 2.

Publishers that have categories grouped into the Category Groups; News, Celebrity & Entertainment, Sports, Business & Economy, Lifestyle, Science & Technology, Otomotive, Religion & Culture, Others. To analyze clickbait headlines based on their categories, they first need to be grouped. Since publishers have different category names for similar topics, the CLICK-ID dataset groups headlines into 9 general categories.

| Publisher         | Celebrity & Entertainment | Sports | Business & Economy | Lifestyle | Science & Technology | Otomotive | Religion & Culture | Others |
|-------------------|---------------------------|--------|--------------------|-----------|----------------------|-----------|--------------------|--------|
| detikNews         | ✓                         | ✓      | -                  | -         | -                    | -         | -                  | -      |
| Fimela            | -                         | -      | -                  | ✓         | -                    | -         | -                  | -      |
| kapanlagi         | -                         | ✓      | ✓                  | ✓         | ✓                    | -         | -                  | -      |
| kompas            | ✓                         | ✓      | ✓                  | ✓         | ✓                    | ✓         | ✓                  | -      |
| liputan6          | ✓                         | ✓      | ✓                  | ✓         | ✓                    | ✓         | ✓                  | -      |
| okezone           | ✓                         | ✓      | ✓                  | ✓         | ✓                    | ✓         | ✓                  | -      |
| posmetro          | ✓                         | ✓      | ✓                  | ✓         | ✓                    | ✓         | ✓                  | -      |
| republika         | ✓                         | -      | ✓                  | ✓         | ✓                    | ✓         | ✓                  | ✓      |
| sindonews         | ✓                         | ✓      | ✓                  | ✓         | ✓                    | ✓         | ✓                  | -      |
| tempo             | ✓                         | ✓      | ✓                  | ✓         | ✓                    | ✓         | ✓                  | -      |
| tribunnews        | ✓                         | ✓      | ✓                  | ✓         | ✓                    | ✓         | ✓                  | -      |
| wowkeren          | ✓                         | ✓      | ✓                  | ✓         | ✓                    | ✓         | ✓                  | -      |

### Table 3.

Headline distribution per Category Group. Based on the categories that were grouped into the Category Groups, the distribution of clickbait headlines are calculated to be measured.

| Category Groups              | Clickbait | Clickbait percentage |
|------------------------------|-----------|----------------------|
| News                         | 6379      | 30.1%                |
| Celebrity and Entertainment  | 3009      | 66.4%                |
| Sports                       | 1727      | 35.9%                |
| Business and Economy         | 1463      | 26.0%                |
| Lifestyle                    | 1315      | 66.8%                |
| Science and Technology       | 411       | 43.6%                |
| Otomotive                    | 321       | 45.5%                |
| Religion and Culture         | 194       | 46.9%                |
| Others                       | 181       | 44.2%                |
| Total                        | 15000     | 41.9%                |
egory groups have the lowest clickbait rates, while Celebrity & Entertainment and Lifestyle have the highest clickbait rates.

2. Experimental design, materials, and methods

In this section, the procedure of collecting, as well as pre-processing, of the CLICK-ID dataset is discussed. Furthermore, we discuss the experiment of using the dataset to develop an Indonesian clickbait classification model.

By the nature of the dataset, primary data is collected directly from published articles. Specifically, we focused on articles that were published in the Indonesian language. Several datasets have been compiled for the studies of clickbait in the English language [1, 5–7]. The procedure of data collection for the CLICK-ID dataset is modelled based on these previous works, in particular Chakraborty [6]. We also improved and used the sources that have been implemented from previous works on compiling an Indonesian clickbait dataset by Maulidi and Ayilillahi [8, 9].

Since there is a large number of Indonesian publishers and it is not practical to collect from them all, only a selected few are chosen. The criteria are mostly based on popularity since the aim of the dataset is to best represent Indonesian articles. Nine of the publishers chosen are on the top 50 most visited websites in Indonesia based on Alexa’s [10] ranking in September 2019, as shown in Table 4. From every publisher, all news categories were scraped from the publishers’ website. Only in the case of detik.com where only the ‘detikNews’ category group was scraped.

Other considerations include the availability of data (some publishers only keep a limited number of past articles). Furthermore, to create a balanced dataset, several assumptions were made by the authors on how likely a publisher is to publish a clickbait based on their recent articles. Publishers that are assumed to be more likely to have clickbait articles are then also included. These considerations then made up into the final selection of the 12 publishers.

3. Scraping

Collection of the articles from the 12 publishers were done by scraping their respective websites. Specifically, the publishers’ index pages, where published articles from the past are kept, were scraped from. For efficiency, a specific range of date was targeted for all publishers. The
articles that are scraped are the ones that were published during the dates of 10th–21st September 2019. For each publisher, there is an individual scraper assigned. In cases where a publisher does not have an index page, as in the case of Posmetro-Medan, random available articles on the website are retrieved without regards as to the date it was published. Since publishers publish articles at different rates, the limited range of date results in different amounts of headlines scraped from each publisher.

The open-source Python web scraper library Scrapy [11] was utilized to extract data from the websites. Individual spiders are designed producing a (.csv) file for each publisher. Moreover, we conducted our scraping by following each website’s ‘robots.txt’ scraping guideline to scrap within the allowed protocol of each website.

In general, the procedure of the spider follows the algorithm as laid out in Algorithm 1 with slightly different modifications to accommodate the different index page structures. First, it begins by navigating to the publisher’s index page and parsing all the article URLs in the given page. The articles’ data are then collected from these article URLs. After all the articles data on an index page is collected, it then moves to the next page and the procedure is repeated. For each article, the spider collects 6 information regarding the article: headline, publisher name (source), date and time the article was published, category and sub-category of the article, the content of the article, and the URL of the article page. During this process, preliminary preprocessing was done to the data by removing irrelevant symbols such as html tags. In cases where the data is not provided by the publisher, it is left with the symbol ‘-‘. This procedure applies for most of the scraping process, except in cases where the publisher does not provide an index page. Finally, the scraping results in 12 distinct files each belonging to a publisher. In total, we collected 46,119 articles data from the 12 publishers.

**Algorithm 1.** Scraping Procedure

```
Input: U - Url of publisher’s main index page
Parameter: N - Number of days to scrape
Output: D - Article Dataset containing: Title, Source, Date, Time, Category, Sub-Category, Content

1: Generate list of per date index URL pages L by concatenating main URL U with number of dates range N
2: for every index page link in L do
3: procedure ParseIndexPage():
4: Generate a list of article links AL in page
5: for every article link in AL do
6: Collect all necessary article data A from an article page
7: yield article data A to D
8: if next page exists then
9: Navigate to next page
10: call ParseIndexPage()
11: Generate dataset file D
```
Table 5.
Sample of the annotation file given to the annotator.

| Headline (Original)                                                                 | Non-Clickbait | Clickbait |
|-------------------------------------------------------------------------------------|---------------|-----------|
| Truck Hilang Kendali di China, 10 Orang Tewas (Truck Loses Control in China, 10 People Died) | 1             |           |
| Iniilah 3 Lokasi di Kota Medan dengan harga Rumah yang Fantastis! (These are the 3 Locations in Medan City with Fantastical Home prices!) | 1             |           |

4. Pre-processing

During the scraping phase, pre-processing was done only in removing unwanted characters from the data that were collected. This includes metacharacters and tags used for HTML such as `<n>` and `<t>` that should not be in the headline string. This is done through Python functions and regex operations. There was no additional pre-processing that was done to the headlines. Headline structure is preserved as it is collected (with symbols and Uppercases) for annotation.

The (`.csv`) files that were generated from the scrapers are then converted into .xlsx using a separate python module. Both files are also concatenated with other respective files from other publishers to generate a combined version file. We provide this pre-processing result in the raw folder.

5. Annotation

Following the results of the scraping and pre-processing of 46,119 articles, we selected a limited number of articles to be annotated. From most of the publishers, 1500 articles are chosen for their headlines to be annotated as shown in Table 1. Other publishers with fewer articles, such as Fimela, Posmetro-Medan, and Kapanlagi are taken appropriately according to their numbers. Since detikNews is comprised of only one category (news) only a limited number is selected to avoid unbalancing the dataset.

The annotation process is done manually through spreadsheet applications such as Microsoft Excel and Google Spreadsheet. Twelve individual spreadsheet files with a total of 15,000 headlines are distributed among 17 undergraduate students, who are all native Indonesian speakers. Each file is distributed to 3 different annotators, with some annotators receiving more than one file. The spreadsheet files used for this process are modified to have extra columns for the labels: ‘clickbait’ and ‘non-clickbait’ column. The sheets are then replicated to have 3 more copies with each sheet reserved for an annotator. Annotators were instructed to enter the value ‘1’ on the column label which matches their judgment, as shown in Table 5. A headline would have a value of ‘1’ on the column ‘clickbait’ if it is judged as a clickbait, and vice versa. Labels were determined based only on the headline of the article, which follows the standards of other clickbait datasets [1, 5, 7].

Before the files are distributed, the participating annotators were gathered for a briefing. The purpose is to establish a single idea of what constitutes as a clickbait. This include discussions on the definition of a clickbait continued with a review of random samples of headlines. Each sample is annotated together with the author as the final determiner. If there is disagreement on the label, the reasons are discussed until a full agreement is reached. Annotation is then conducted on participants personal computer through spreadsheet applications. After it is done, the file is then reviewed by the author. If there are blanks or duplicate labels, the files are returned to the annotator for review. The results of the annotation are available in the annotated folder.

6. Experiment

Using the annotated headlines from the CLICK-ID dataset, we developed an Indonesian clickbait classification model. The model was developed based on the works of English clickbait
classification model [5–7]. In particular, we approached the problem to replicate the results of Agrawal [6], which indicated the favourable results of using Bi-LSTM architecture and the CNN architecture. Only in this case, we implemented the model using the CLICK-ID dataset.

The Bi-LSTM (Bidirectional LSTM) model is an expansion of the LSTM architecture first proposed in 1997 [12]. It belongs to the family of Recurrent Neural Networks which are suited for analyzing sequential data [13]. The Bi-LSTM model is similar to the LSTM model, with the difference that it processes sequential data both forwards and backwards. On the other hand, the CNN architecture is originally an architecture suited for image classification that has been shown to also work well on text data [14].

First, we implemented further pre-processing by lowering casing all the headline inputs. We then use different pre-processing with the data resulting in 3 different data. One with symbols, one without symbols, and the other with stemmed words. We then processed our main and all_agree dataset into these 3 pre-processing methods, resulting in a total of 6 datasets. Using these 6 datasets, each is used as input for the 2 models, Bi-LSTM and CNN. For comparison, Chakraborty’s [5] dataset is also used as input. We then performed a 5-fold Cross-validation on the dataset, shown in Table 6. Accuracy is used as the evaluation metric in which it is defined as the number of Correct Predictions divided by Total Predictions.

Table 6.
5-fold Cross-Validation performance.

| Dataset                  | Avg Acc  |            |
|--------------------------|----------|------------|
|                          | CNN      | Bi-LSTM    |
| MainWithSymbol           | 0.7639   | 0.7697     |
| MainNoSymbol             | 0.7579   | 0.7779     |
| MainStemmedWords         | 0.7112   | 0.7270     |
| AGWithSymbol             | 0.8576   | 0.8832     |
| AGNoSymbol               | 0.8781   | 0.8678     |
| AGStemmedWords           | 0.7958   | 0.8125     |

*AG = all-agree*

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships which have, or could be perceived to have, influenced the work reported in this article.

Acknowledgments

We would like to thank the publishers detik, Fimela, Kapanlagi, Kompas, Liputan6, Republika, SindoNews, Tempo, TribunNews, Okezone, Wowkeren, and Posmetro-Medan for providing their articles publicly available. We also would like to thank the volunteers who have participated in the annotation of this dataset.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.dib.2020.106231.

References

[1] M. Potthast, S. Köpsel, B. Stein, M. Hagen, Clickbait detection, in: ECIR: Advances in Information Retrieval, 2016, pp. 810–817, doi:10.1007/978-3-319-30671-1_72.

[2] H.-T. Zheng, J.-Y. Chen, X. Yao, A.K. Sangaiah, Y. Jiang, C.-Z. Zhao, Clickbait convolutional neural network, Symmetry 10 (2018) 138, doi:10.3390/sym10050138.
[3] J.L. Fleiss, Measuring nominal scale agreement among many raters, J. Psychol. Bull. (1971), doi:10.1037/h0031619.

[4] J.L. Fleiss, J. Cohen, The equivalence of weighted kappa and the intraclass correlation coefficient as measures of reliability, J. Educ. Psychol. Measur. 10.1177/001316447303300309.

[5] A. Chakraborty, B. Paranjape, S. Kakarla, N. Ganguly, Stop clickbait: detecting and preventing clickbaits in online news media, in: Proceedings of the IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM), 2016.

[6] A. Agrawal, Clickbait detection using deep learning, in: Proceedings of the 2nd International Conference on Next Generation Computing Technologies (NGCT), 2016.

[7] A. Anand, T. Chakraborty, N. Park, et al., We used neural networks to detect clickbaits: You won’t believe what happened next!, in: J.M. Jose, et al. (Eds.), Advances in Information Retrieval, Springer International Publishing, Cham, 2017, pp. 541–547, 10.1007/978-3-319-56608-5_46.

[8] R. Maulidi, M.F. Ayilillahi, Penerapan neural network backpropagation untuk klasifikasi artikel clickbait, Seminar Nasional Sains dan Teknologi (SENASTEK), 2018.

[9] I. Habibie, Identifikasi Judul Berita Clickbait Berbahasa Indonesia dengan Algoritma Long Short Term Memory (LSTM) Recurrent Neural Network', Skripsi. Fakultas Ilmu Komputer dan Teknologi Informasi, Universitas Sumatera Utara, Medan, 2018.

[10] Alexa Internet. 2019.

[11] D. Kouzis-Loukas, Learning Scrapy, Packt Publishing Ltd., Birmingham, 2016.

[12] S. Hochreiter, J. Schmidhuber, Long short-term memory. Neural Comput. (1997), doi:10.1162/neco.1997.9.8.1735.

[13] I. Goodfellow, Y. Bengio, A. Courville, Deep Learning, The MIT Press, 2016.

[14] Y. Kim. Convolutional neural networks for sentence classification. Proceedings of the Conference on Empirical Methods in Natural Language Processing. 10.3115/v1/D14-1181.