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Implementation of Software-Based Conflict Early Warning and Early Response System (CEWERS) Using Crowdsource Data as a Preventive Effort to Solve Communal Conflict Problems in Indonesia

by Billie Adrian

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Indonesia is the largest archipelagic country in Association of Southeast Asian Nations (ASEAN) which has an area of 1,905 million square kilometres and consists of more than 17,000 islands. The area and the many islands in Indonesia produce a community with distinctive characteristics in each region. These differences include ethnicity, culture, race, and class. Based on data from the Central Statistics Agency (BPS) in 2010, the ethnic groups in Indonesia have almost reached a value of 1,340 which is the range of 300 ethnic groups. Not only that, but this also indicates that Indonesia is a country with a high level of diversity both in ASEAN and in the world.

Diversity can be seen as a double-edged sword. This is because diversity can be used to provide an identity for the Indonesian nation in the eyes of the international community. Conversely, diversity can lead to conflicts between different communities in each region. It is true that conflict can be avoided by cultivating a sense of tolerance among communities. However, the reality is that not all societies have the same level of tolerance. This statement is supported by BPIP data where cases of intolerance continue to increase in Indonesia. Visualization of this case can be seen in the following figure.

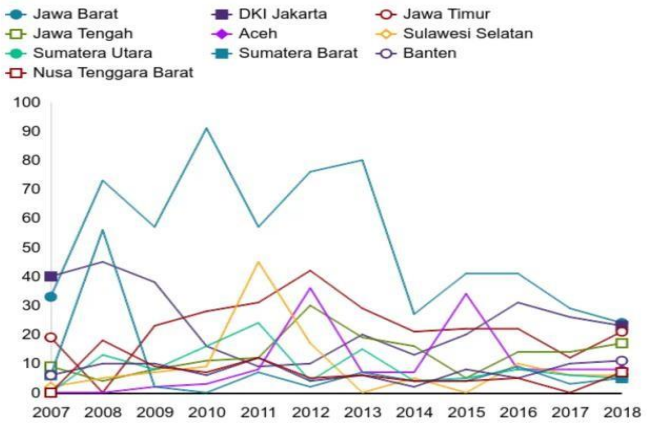


Figure 1. Reports of intolerance cases throughout 2007-2018 in Indonesia, Source: (Sigit & Hasani, 2020)

Figure 1 is a visualization of the graph of cases of intolerance that occurred in several regions in Indonesia in the 2007-2018 period. Some of these areas include West Java, Central Java, North Sumatra, West Nusa Tenggara, Jakarta, Aceh, West Sumatra. East Java, South Sulawesi, and Banten. Based on the graph, the area with the highest cases of intolerance is found in West Java where West Java ranks first compared to other regions. The number of cases of intolerance indicates that the Indonesian people still do not fully accept the diversity in Indonesia. The sense of tolerance that is not shared by every community also produces a new problem, namely communal conflict.

Communal conflict can be defined as violent conflict between non-state groups organized based on a shared communal identity (Sujarwoto, 2016). In principle, the perpetrators of this conflict come from the community itself without interference from the authorities or the armed forces. This conflict is anarchic and destructive which can divide the community and potentially pose a threat to the disintegration of the nation. In Indonesia, communal conflicts tend to occur over time. The following is a map of the distribution of communal conflicts that occurred in Indonesia in 2008.

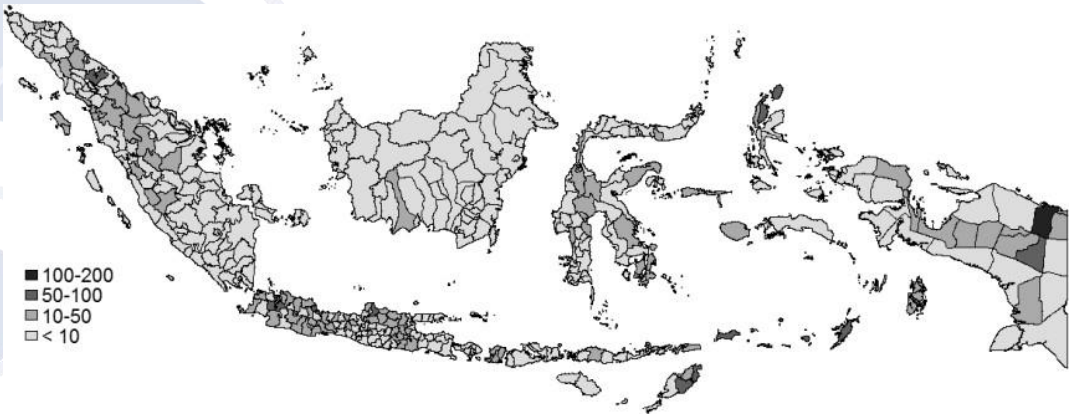


Figure 2. Map of the distribution of communal conflicts that occurred in Indonesia in 2008, Source: (Sujarwoto, 2016)

In Figure 2, communal conflicts can arise in every region in Indonesia. The highest frequency of conflict can be seen in Papua, especially in districts in border areas such as Jayapura, Mappi, Mamberamo Raya, and Supiori. Meanwhile, other areas such as North Sumatra and Aceh. In fact, this conflict often occurs in the capital city of Indonesia, namely Jakarta. Conflicts that occur also cause losses both material and life. Communal conflicts in 2008 resulted in loss which can be seen in the following figure.

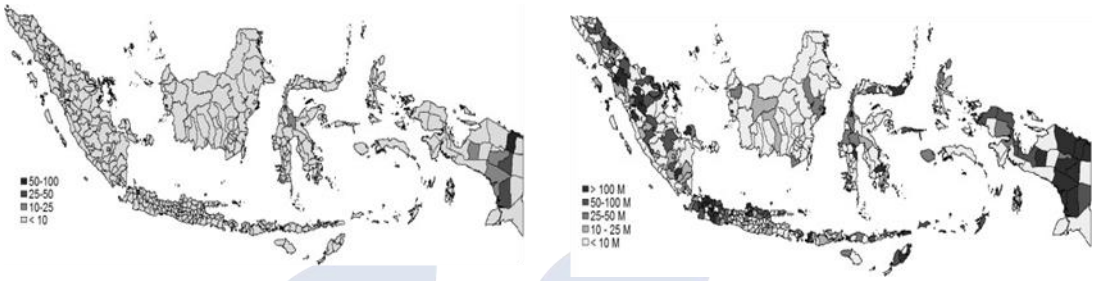


Figure 3. (a) The amount of loss of life due to communal conflict and (b) material damage due to communal conflict in 2008, Source: (Sujarwoto, 2016)

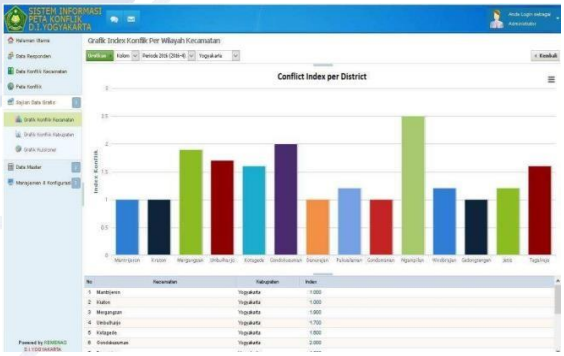
Communal conflicts that occur in an area need to be resolved quickly because the resulting losses have a major impact on the development of a country. Not only that, the development of infrastructure in the area will be hampered and even destroyed. Figure 3 shows that the losses caused by communal conflict are casualties that reach hundreds of people to hundreds of millions of rupiah in material. This condition continues to worsen over time from 2008 to the present. Therefore, prevention efforts are needed that must be developed to prevent the possibility of communal conflicts in other areas.

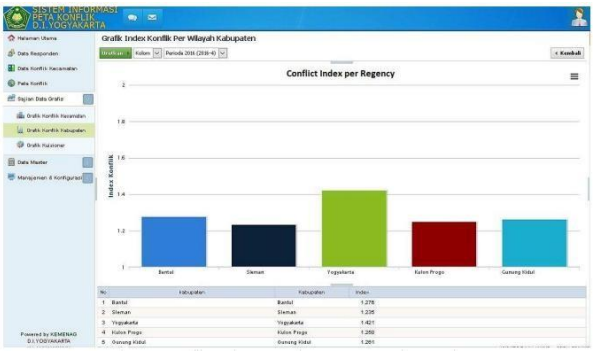
In this era of globalization, life will not develop as fast as it is now without the help of technology. Technological developments have revolutionized human life in all fields. Starting from the internet that can connect people from various worlds to smartphones that are almost owned by all people around the world. In fact, technological developments have been focused on developing a new world called virtual reality that can allow people to interact with each other in a virtual world. Some of these technologies are proven helpful to humans in all fields.

Conflict early warning systems and early response systems are systems used to identify and trigger action to reduce the duration, intensity, and effects of various forms of communal violence or direct war (Muggah & Whitlock, 2022). Utilization of this system is focused on timely and appropriate prevention initiatives, usually carried out during the dormant stages of a perceived potentially violent conflict. Data is the most important component in the conflict early warning system (Kelly, 2019). This is due to the working principle of the system consisting of data collection, risk analysis, and providing information with recommendations to targeted stakeholders. One example of an early warning system that already exists in Indonesia but has not maximized its potential is in the Yogyakarta region.

Figure 4. The early warning system in the Yogyakarta area, Source: (Ali, 2019)

Figure 4 is an early warning and response system located in the Yogyakarta area. The conflict map information system consists of four main menus in the form of the main page, respondent data, sub-district conflict data, and conflict maps. Each menu of this information system design is built with a bottom-up approach (Heyden et al., 2017). This means that conflict data is collected from the social unit under each sub-district office which also functions as an admin. In maintaining the originality of the data, this system requires conditions before keying in and being processed by the system. The condition is that every admin must upload a supplement file on the system, namely an integrity pact that must be signed by an authorized official.





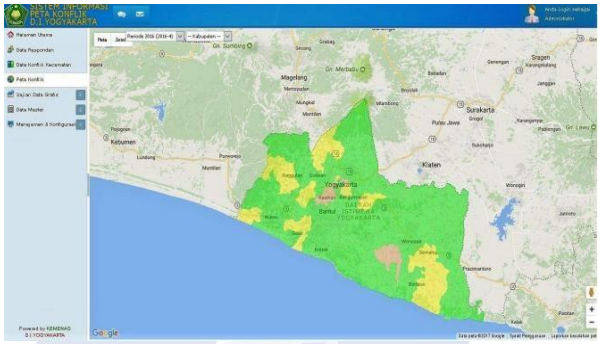


Figure 5. (a) Graphical visualization of the conflict index per district (b) Visualization of the conflict index graphic per district (c) Visualization of the conflict index map in Yogyakarta, Source: (Ali, 2019)

Each menu contained in the information system shows conflict index data from each region in Yogyakarta in the form of graphs and map visualizations. In graphical form, each region can have a different conflict index. Each index contained in the system follows the conflict range table where the conflict scale can be seen as follows.

Table 1. Range of Conflict Index (Jatmika, 2016)

Range	0.1-1.0	1.1-2.0	2.1-3.0	3.1-4.0
Degree	Zero	Low	Medium	High

Table 1 can assist the system in categorizing conflict levels within an area based on a conflict index. With this table, the handling of a conflict can be differentiated according to its level. Not only that, in Figure 5.C there is a conflict distribution map with different colours for each region. These different colours represent the conflict index for each region, which is very useful for mapping the extent of conflict in the region. This conflict information system also displays a comparison of conflict indices in each sub-district to district, which allows decision makers at the district and provincial levels to act based on conflict patterns.

With this technology, larger communal conflicts can be prevented by reducing the conflict index to an acceptable level (zero) or low (low). Handling must be done when the system has given a warning that the level of conflict has increased to a medium or even high level. Conflict management can also be done to prevent communal conflicts between Indonesian people. Not only that, but this system is also proof that the development of technology for humanity can have a real big impact on the people of Indonesia. Thus, technology can become a powerful weapon to maintain peace in Indonesia.

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