

The Potential of Crowdsourcing to Advance the SDGs by Fostering Local and Global Collaboration

Yulistina Riyadi*, Dikara Alkarisya*, Deepakshi Rawat

Pulse Lab Jakarta

yulistina.riyadi@un.or.id, dikara.alkarisya@un.or.id, deepakshi.rawat@un.or.id

Abstract

The establishment of Sustainable Development Goals (SDGs) intend to support government to respond the world transformation. Along with the government strives to achieve SDGs, technology cannot be dismissed. Technology has radically shifted human behavior, bringing interconnect-edness among citizens in a way that has never been imag-ined before. It offers the potential to contribute to cheaper and faster collective problem-solving, in particular, to solve big and laborious tasks that are impossible to be done by a small number of people. This collective action, namely crowdsourcing, has been implemented in many areas such as supporting research activities, public administration, as well as social projects. Seeing this potential power from citizens, the main objective of this paper to identify the prospective impact of crowdsourcing for SDGs and bring effectiveness for government works. We have identified 183 crowdsourc-ing projects across the globe that are closely related to the development sector. Crowdsourcing is potential to monitor and support to the achievement of SDGs as well as to im-prove people’s awareness on development issues.

Keywords— sustainable development goals; crowdsourc-ing; generating data; crowdfunding; service delivery; partic-ipatory governance; human computation

1 Introduction

In 2015, the United Nations officially launched the Sustain-able Goals (SDGs); a blueprint to ‘end poverty, protect the planet and ensure that all people enjoy peace and prosperity (UNDP,). The SDGs define 17 goals comprising 169 tar-gets and approximately 232 indicators (Statistics,). Many UN member states are incorporating the SDGs into their na-tional development agendas.

Even though governments around the world have made efforts to provide a better life for their citizens, the cur-rent level of development in various parts of the world re-mains uneven, stemming from challenges such as persistent inequalities, demographic issues, access to resources and environmental degradation (Department of Economic So-cial Affairs,). In addition, the increasing interconnectivity of the world has brought opportunities to many, but also a heightened vulnerability to systemic risks and an increas-ingly complex policy environment for governments. Linked to these challenges of interdependence, the progress towards achieving the SDGs also varies from country to country due to differences in the efficacy of strategies and action plans, coordination within and between government bodies and stakeholder engagement tools (UN,).

Considering the above-mentioned situation, expectations and the role of government is shifting, leading to tensions between bureaucratic operations and the needs of network governance. These challenges are not unique to govern-ments, many organisations in the social and private sectors are also encountering similar tensions between their organ-isation design and the complexity of their operating en-vironments. Some of these organisations have responded by creating platforms for mass collaboration, termed crowd-sourcing. Across various sectors and societies, crowdsourc-ing is increasingly helping to generate new insights, to re-structure finance generation and to deliver what would nor-mally be considered public services.

We look at this trend through the lens of its current and potential contributions to achieving the sustainable develop-ment goals, gleaning examples from journals, publications, articles, and case studies, and constructing a database on crowdsourcing for the SDGs. The objective of this paper is to present five classification of crowdsourcing and identify the impact of crowdsourcing for SDGs. It also addresses

how each classification is able to support the government to work effectively with citizen. We classify the crowdsourcing based on how the project owner utilise crowdsourcing task to achieve their main output. The classifications are: generating data, information and knowledge, generating finance for social causes or crowdfunding, delivering services, participatory governance, and human computation.

2 Methodology

We aim to give an overview on the number of crowdsourcing projects that have been classified into five themes. The methodology of this paper used the methodology of writing narrative that has been described and applied by (Chassignol et al., 2018) and (VanLehn et al., 2002).

2.1 On Overview

In order to give information on the overview section, we begin the selection of project collection by citing information from journals, publications, articles and case studies related to crowdsourcing and SDGs. We utilize search engine to find relevant information on crowdsourcing and information in English related to the development sector, more specifically on the SDGs indicators and targets¹. Several sample of keywords that we use are “crowdsourcing for development”, “crowdsourcing AND (each goal of the SDGs or type the indicators or targets)”. We also build our search method from the project list or database, where we search more information from the journals or articles that mention information on crowdsourcing projects. We categorize the information on journals, publications, articles, and case studies by understanding the method of each crowdsourcing project and which SDGs that relevant to the project.

2.2 Description of five classification

Based on the project list of crowdsourcing that we collected, we found that there are five types of crowdsourcing that mostly adapted for SDGs. The projects of generating data, information and knowledge aims to fill the data gap using informal social networks. By collecting reports from citizens, the project can generate a map of an event based on volunteer’s report from the field about the area’s condition (Heipke, 2010). Generating finance for social causes or crowdfunding showed activities from crowd which aim to collect funds for one purpose such as for social project

with freewill contribution (Kim and De Moor, 2017). Delivering services refers to action which implemented due to lack of resources or manpower that might lead to gaps in the state’s welfare policies which crowdsourcing efforts could fill. Crowdsourcing can be one of the strategies to provide services in areas beyond the reach from the public sector. Human computation refers to employing human intelligence or distributed-human-intelligence (Brabham, 2013) (Salganik, 2018) to help them get a quick result to classify data from large datasets. Most of human intelligence project is microtask which easy for humans but it cannot be done by computer (Salganik, 2018). Participatory governance includes activities such as budgeting, strategy and law-making process that help the government to determine policy (Aitamurto, 2012).

3 Five Ways to Explore Crowdsourcing for Sustainable Development Goals

Crowdsourcing is a type of participatory online activity in which a group of people combine their efforts and wisdom for problem solving (Wazny, 2017). For our research, we define crowdsourcing as problem-solving through online collaboration with the aim of generating data and knowledge; sourcing for funds; providing beneficial services through distributed efforts (sometimes known as co-delivery); participatory governance; and human computation. We find that these five themes are useful in analysing the means through which crowdsourcing can help achieve the SDGs.

3.1 Generating data, information and knowledge

Sourcing relevant data, information and knowledge can help governments and other organisations in sense-making, decision-making and enabling effective action, especially during moments of crisis. In some circumstances, collecting data is a challenging task due to the need for speed, lack of resources, as well as an absence of tools and methods.

A project called Katrina PeopleFinder was set up in 2005 to collect information on the safety of people affected by Hurricane Katrina. The project was established along with the establishment of KatrinaHelp Wiki by volunteers. The project progressed rapidly as volunteers entered 15,200 records marking victims as missing or safe within 24 hours. This activity could not have been done without the col-

¹<https://unstats.un.org/sdgs/metadata/>

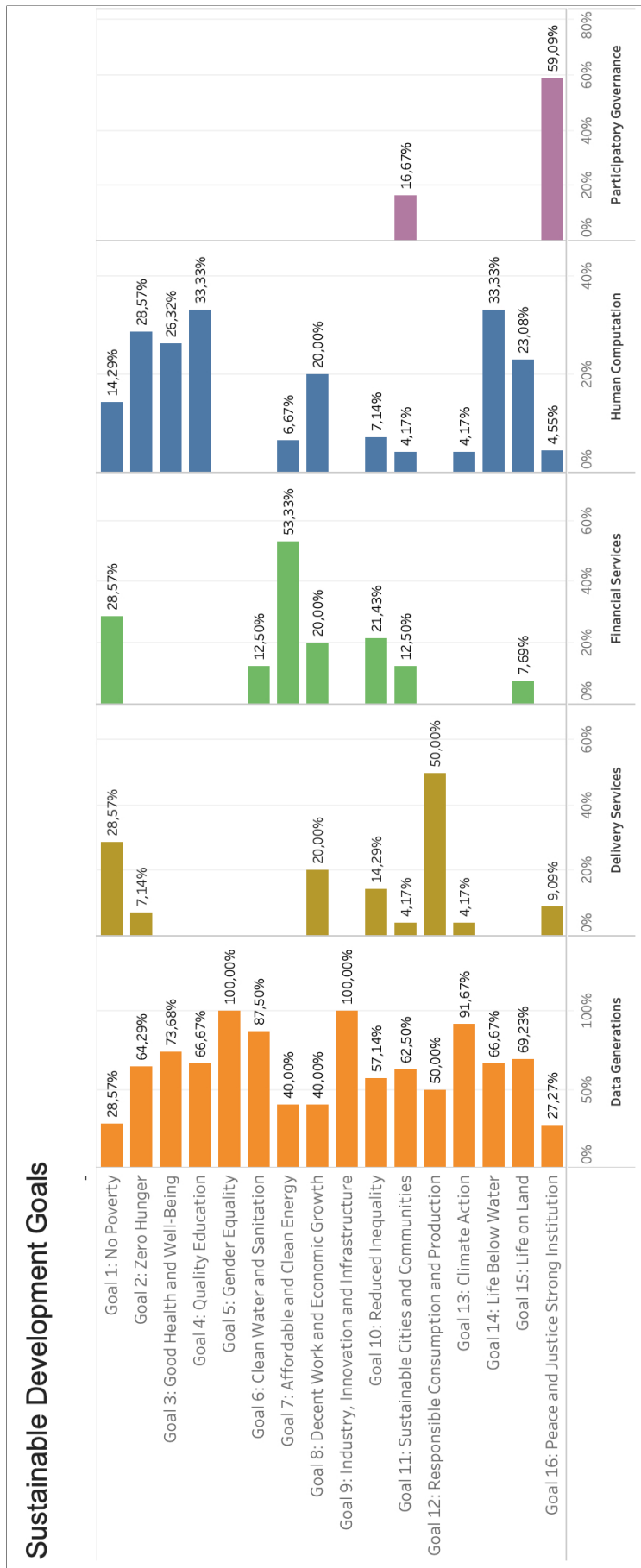


Figure 1: The percentage of crowdsourcing projects based on classification for each SDG

lective effort of the crowd/volunteers. Another example is a translation project called Translator Gator by Pulse Lab Jakarta which crowdsourced translations of disaster-related keywords in 29 languages used across the ten ASEAN member states and Sri Lanka (Riyadi and Vacarelu, 2012). The translations are used as keywords to extract disaster-related information from social media, as there are no readily available disaster-related keywords in regional languages. By having these translations, non-English speakers can be better 'heard' by social researchers and disaster responders.

3.2 Generating finance for social causes

Crowdsourcing also has the ability to generate finance by restructuring and channeling local and global resources. Crowdfunding sources finance from the crowd to advance social causes or support the pursuit of new businesses opportunities (Kim and De Moor, 2017). Relevant to the SDGs, some platforms help connect people in search of funding with people who are willing to channel their funding for a social cause. For example, Kitabisa.com², is a crowdfunding website that facilitates raising funds for various philanthropic causes such as medical expenses. iGrow³ and Gandengtangan⁴, are also crowdfunding platforms where farmers can meet potential investors. These platforms help farmers, who are otherwise unable to get loans from traditional financial institutions such as banks.

3.3 Delivering services

Lack of resources or manpower might lead to gaps in the state's welfare policies which crowdsourcing efforts could fill. Crowdsourcing can be one of the strategies to provide services in areas beyond the reach from the public sector. Another effective project was performed in Indonesia year 2014. In the immediate after the presidential elections in Indonesia, Kawal Pemilu was launched to guard the election within the country (Graft et al., 2016). The aim of the project is to provide transparency and tackling corruption during the election. The project starts after Indonesian volunteers across the world create a website that allows citizens to compare official vote tallies with the original tabulations of polling stations that had been made by the Elections General Commission (KPU) (Graft et al., 2016). Kawal Pemilu works by inviting volunteers to manually digitize 500,000 scanned C1 forms on the KPU website. Kawal Pemilu has been recognised by Election Supervisory Agency (Bawaslu)

²<https://kitabisa.com/>

³<https://igrow.asia/>

⁴<https://gandengtangan.org/>

and not affiliated with other institutions⁵. There are several aspects why Kawal Pemilu can be acknowledged as a successful crowdsourcing project as well as an impressive example of "public-service startup". First, in terms of public engagement, the project was successfully assembling 700 volunteers and enable citizen participation to monitor the election results. These affected public trust improvement as well as assisting the democratic transition. Second, the project did not require an expensive budget as overall it only cost USD 54 whereby it is only for purchasing the website's domain. Third, in the midst of corruption and exclusive issues, Kawal Pemilu was able to encourage the government to commit towards openness and transparency (Graft et al., 2016).

As a result, Kawal Pemilu can give a piece of evidence that the result was very similar to the official KPU result. In fact, the election result was taken to court as one of the presidential candidates argued that the KPU result was not valid. Kawal Pemilu holds an important role in the court hearings and its testimony that had been provided by KPU officials and other expert witnesses was really powerful to influence the court's decision to proof that KPU results were valid (Graft et al., 2016).

3.4 Participatory governance

Most of the crowdsourcing projects of this classification include budgeting, strategy and law-making process (Aitamurto, 2012) that contribute for the government to determine policy. The local government in Chicago, United States, conducted a budget preparation through crowdsourcing. The activity was supported by the Mayor especially to implement transparency in the city (Aitamurto, 2012). To achieve the goal, the city needs citizen participation to give feedback on what should the budget prioritize on and cut the budget for unnecessary needs. In the beginning, the city must create a platform to accommodate citizen ideas. After citizens submitted their ideas, the official city government can review all comments, whereas citizens are also able to follow the progress. Another method to submit ideas is through social media such as Twitter, Youtube and Facebook by using hashtag AskChicago (Aitamurto, 2012). The project is nominated as a successful crowdsourcing project as a pioneer in the United States. Budget preparation project has been followed by other cities, for instance, Cook County.

⁵<https://kawalpemilu.org/tentang/>

3.5 Human computation

Many research institutions employed human intelligence or distributed-human-intelligence to help them get a quick result to classify data from large datasets (Brabham, 2013)(Salganik, 2018). Most of human intelligence project is microtask which easy for humans but it cannot be done by computer. Crowdsourcing human computation is appropriate if the data is available and known (Brabham, 2013). Prior doing the tasks, participants needs to follow training in order to understand the methods. The training is important as the crowds will identify the data that already break down into microtask and not all the volunteers are familiar with the given data. Since human computation crowdsourcing is relatively least creative and relatively less intellectually demanding, the project owner faced several problems to maintain the volunteers consistency to do the task. To overcome this challenge, a rewarding is important to motivate participation, such as monetary compensation, merchandise, and other benefits (Brabham, 2013).

4 Discussion - Implications in the public governance

From above mentioned classifications, we have demonstrated that crowdsourcing is really powerful to the achievement of SDGs. The goal 17 of Sustainable Development, which covers the point of building partnership between government and other parties especially with private sectors or citizen, reflects the meaning of crowdsourcing itself. Since SDGs are very broad and various, the topic of crowdsourcing projects would vary according to the needs. The implementation scheme of crowdsourcing itself would be vary depends on the goal of the project.

We have outlined five broad ways in which crowdsourcing can help to achieve the SDGs as well as some insights from our mapping exercise. Based on 183 crowdsourcing project list we have, the most popular classification is generating data. While the SDG number that having the most crowdsourcing project is goal 11, Sustainable Cities and Communities. In this goal, the main idea of the project that we categorised into this are related to disaster response and city development. On disaster relief, it is inevitable that disaster can bring negative effects such as economic damage, homeless, insecurity and health. A quick delivery response for those in need is getting important particularly for people who live in a country with extreme political and economic struggle as well as under poverty (T. Riccardi, 2016).

As technology evolves, any response towards disaster operation must evolve to take advantage of these new opportunities. The most used classification on disaster management is generating data since giving a real time information such as electricity, communications, food, water, damage, road conditions, and other information is vital for disaster relief organization and government.

The providing information later increased the speedy recovery efforts. Thus, crowdsourcing allows NGOs, government, and other disaster managers to collaborate and coordinate across agencies, expertise, and volunteers who are potential to share valuable information (Yates and Paquette, 2011). An effective way to involve everyone in disaster preparedness is through crowdsource updates in order for mapping that will be used for emergency managers (T. Riccardi, 2016). The Federal Emergency Management Agency under the Department of Homeland Security of the United States government, acknowledged that the concept of community collaboration on preparedness is a shared responsibility, it calls the involvement of everyone and not only the government (Vivacqua and Borges, 2012).

While on city or urban development, crowdsourcing is seen as something that can increase community engagement or public participation and to influence local government decision making (Marzano et al., 2017). Public participation is a key priority in public planning whereas crowdsourcing is considered as the suitable approach to engage citizens especially to facilitate open dialogue between citizens and urban planners (Bugs et al., 2010). The applications of crowdsourcing for urban development has been applied for (1) urban planning and public participation, (2) city maintenance and personalized maps, (3) emergency monitoring which also related to disaster management, (4) mobility, (5) socialization, and (6) guiding technology appropriation. The use crowdsourcing in urban socialization is important for understanding the behaviour of urban communities especially to collect opinions and attitude (Marzano et al., 2017). In a nutshell, connecting citizens with information can improve and enhance public services so the government can address the problem quickly (Idzalika et al., 2018).

5 Conclusion

It is important to highlight that crowdsourcing is not a silver bullet for all development challenges. Despite its benefits, crowdsourcing requires prerequisite factors, such as connectivity, ownership of gadgets, and technological literacy to get involved. Also, achieving the SDGs will require a big in-

crease in the allocation of resources. In this context crowdsourcing can help with policy and programme design, and ensure more effective delivery; it is part of the solution, but not the full solution itself.

6 Acknowledgements

Pulse Lab Jakarta (PLJ) is grateful for the generous support from the Government of Australia. The lab is a joint initiative of the United Nations and the Government of Indonesia, via United Nations Global Pulse and the Ministry of National Development and Planning (Bappenas) respectively.

References

- Aitamurto, T. (2012). *Crowdsourcing for Democracy: New Era in Policy-Making*.
- Brabham, D. C. (2013). *Crowdsourcing*. The MIT Press essential knowledge series. MIT Press.
- Bugs, G., Granell, C., Fonts, O., Huerta, J., and Painho, M. (2010). An assessment of public participation gis and web 2.0 technologies in urban planning practice in canela, brazil. *Cities*, 27:172–181.
- Chassignol, M., Khoroshavin, A., Klimova, A., and Bilyatdinova, A. (2018). Artificial intelligence trends in education: a narrative overview. *Procedia Computer Science*, 136:16–24.
- Department of Economic Social Affairs, U. N. World economic and social survey 2013.
- Graft, A., Verhulst, S., and Young, A. (2016). Indonesia’s kawal pemilu - elections: Free, fair and open data.
- Heipke, C. (2010). Crowdsourcing geospatial data. *ISPRS Journal of Photogrammetry and Remote Sensing*, 65:550–557.
- Idzalika, R., Pramestri, Z., Amin, I., Riyadi, Y., and Hodge, G. (2018). Big data for population and social policies.
- Kim, H. and De Moor, L. (2017). The case of crowdfunding in financial inclusion: A survey. *Strategic Change*, 26:193–212.
- Marzano, G., grewinski, m., and Lizut, J. (2017). Urban crowdsourcing: Potential and challenges.
- Riyadi, Y. and Vacarelu, F. (2012). Phase 2 of translator gator wraps up.
- Salganik, M. (2018). *Bit by Bit*. Princeton University Press.
- Statistics, U. N. Global indicator framework for the sustainable development goals and targets of the 2030 agenda for sustainable development.
- T. Riccardi, M. (2016). The power of crowdsourcing in disaster response operations. *International Journal of Disaster Risk Reduction*, 20.
- UN. The sustainable development goals report 2018.
- UNDP. What are the sustainable development goals?
- VanLehn, K., Jordan, P. W., Rosé, C. P., Bhembé, D., Bötner, M., Gaydos, A., Makatchev, M., Pappuswamy, U., Ringenberg, M., Roque, A., Siler, S., and Srivastava, R. (2002). The architecture of why2-atlas: A coach for qualitative physics essay writing. In Cerri, S. A., Gouardères, G., and Paraguaçu, F., editors, *Intelligent Tutoring Systems*, pages 158–167, Berlin, Heidelberg. Springer Berlin Heidelberg.
- Vivacqua, A. S. and Borges, M. R. (2012). Taking advantage of collective knowledge in emergency response systems. *Journal of Network and Computer Applications*, 35(1):189 – 198. Collaborative Computing and Applications.
- Wazny, K. (2017). Crowdsourcing ten years in: A review. *Journal of Global Health*, 7(2).
- Yates, D. and Paquette, S. (2011). Emergency knowledge management and social media technologies: A case study of the 2010 haitian earthquake. *International Journal of Information Management*, 31:6–13.