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The Innovation Breakthrough in Digital and Disruptive Era

Village Open Data Implementation: Lesson Learned from Alang-alang Vilalge, Madura

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Abstract. Alang-alang village is one of the villages in Bangkalan, Madura, near the Suramadu bridge. This village has a vision to be a smart cyber village. However, the application of open data need to be explored, especially in the village area. We just found the implementation of the open data application in Wonosobo and Bantul. Therefore, researching implementing Open data applications at the village level is important. This study aims to capture the open data application 1.0 implementation for the Alang-Alang Village Government. It will explore the richness of the village open data implementation's success factors, challenges, and uniqueness. This research contributes by providing a lesson learned and a novel model for Village Open Data Implementation based on the case study of the Alang-alang village open data application. Moreover, this research also has some implications for knowledge and practice for other villages' governments, researchers, practitioners, and village ministries worldwide, such as the implementation model can be adopted for other contexts and villages. In the body of knowledge, it develops a body of e-Government and smart village knowledge and research fields. Based on this case study, there are some success factors for village open data implementation: Vision and commitment of the village leader, regulation, people's support and participation, infrastructure, and digital literacy.

1 Introduction

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In Indonesia, the open data application has been implemented in many institutions as part of Indonesian electronic government (e-Government) development [1]. The Open Data Initiative in Indonesia has emerged as a transformative force in promoting transparency, accountability, and innovation in the country. With the increasing recognition of the value of data as a strategic asset, the Indonesian government has taken significant steps to open up its vast reserves of information to the public. This initiative aims to foster greater citizen engagement, stimulate economic growth, and drive evidence-based decision-making across various sectors [2].

The concept of open data states that certain data should be freely accessible to the public with no limitations on usage, redistribution, or access. By making data openly accessible, governments and organizations enable citizens, researchers, and businesses to analyze, interpret, and utilize information for the benefit of society [3].

The open data movement has gained significant momentum globally, and Indonesia has been actively embracing this concept in recent years. One of the key drivers behind the open data movement in Indonesia is

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Alang-alang village is one of the villages in Bangkalan, Madura. This village has a young, educated, and visionary leader. However, most of the people in this village are farmers and still have a low-level education background. Therefore, one of the village head programs is "The Langit Scholarship" for some young citizens to continue their education at the university level.

This study will explore the richness of the village open data implementation's success factors, challenges, and uniqueness in the Alang-Alang Village. This village has implemented a mobile application, one card one family, and village regulation about e-Government implementation in Alang-alang village. By this digital initiation, Alang-alang village was categorized as a connected

the desire to enhance transparency and combat corruption. By releasing government data sets, such as budget information, procurement data, and public service performance metrics, the Indonesian government aims to promote accountability and ensure that public resources are utilized efficiently and effectively [4]. Open data empowers citizens and civil society organizations to scrutinize government activities, identify irregularities, and demand greater integrity and responsiveness from their elected representatives [5]

Moreover, the open data initiative in Indonesia recognizes the potential of data-driven innovation to fuel economic growth and improve public services. By unlocking valuable datasets, entrepreneurs, researchers, and developers can harness this information to create new products, services, and insights that drive technological advancements and economic productivity. Open data has the potential to spur innovation in various sectors, including healthcare, education, transportation, and agriculture, leading to improved services, job creation, and economic competitiveness [1].

village by getting 2.25 out of 5.0 from the Digital Village Index (DVI) [7] from the village digitalization in 2021.

This paper has some brief structures as follows: introduction, literature review, research methods, analysis and discussions, as well as conclusions. The introduction section contains the village open data research gap, and the profile of Alang-Alang Village. Furthermore, the second section is a literature review comprising smart village, e-Government, open data, and village open data works of literature. Moreover, the next section is the research method explains the step by steps of the research. Then, the fourth section is a discussion and analysis of the case study, challenges, lessons learned, uniqueness, and the developed implementation model. Lastly, the conclusion section provides a summary and future research.

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businesses to analyze, interpret, and utilize information for the benefit of society [3].

The open data movement has gained significant momentum globally, and Indonesia has been actively embracing this concept in recent years. One of the key drivers behind the open data movement in Indonesia is the desire to enhance transparency and combat corruption. By releasing government data sets, such as budget information, procurement data, and public service performance metrics, the Indonesian government aims to promote accountability and ensure that public resources are utilized efficiently and effectively [4]. Open data empowers citizens and civil society organizations to scrutinize government activities, identify irregularities, and demand greater integrity and responsiveness from their elected representatives [5].

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2. Literature Review

The Indonesian government has taken concrete steps to advance the open data agenda. In 2014, the Ministry of Communication and Information Technology established the National Open Data Portal, an online platform that serves as a central repository for open government data. This portal provides a single point of access to a wide range of datasets, including demographics, environmental data, and socioeconomic indicators. Additionally, the government has implemented policies and regulations that promote the release of open data across different ministries and agencies [2].

However, challenges still exist in realizing the full potential of the open data initiative in Indonesia. These include technical barriers, such as data quality and interoperability issues, as well as legal and privacy concerns surrounding the release of sensitive information. Government, civic society organizations, and the commercial sector must work together to overcome these obstacles to develop robust data governance frameworks, ensure data protection, and build capacity for data utilization [8].

There are some works of literature related to smart village dan Open data, such as Wang et al (2022) found that the society, services, and cultural dimensions are less dominant than technological factors. Therefore, a human-centric, community-led, and knowledge-based rural society is important

in developing a smart village ecosystem [9] Furthermore, a revitalization tool and spreading information and communication technologies in rural areas are important for rural Poland [10].

Moreover, this study generated data from various literature and online survey about rural development policies. Six different EU Member States, including eleven regions, all from the Alpine Space, conducted the survey. Are 114 policies captured in this review paper, along with policy projects, programs, and actions.

that smart rural development must be applied with a place-based approach[14].

This research focuses on evaluates the applications of IoT in the village areas to improve the quality of life in villages. Smart Villages design and development are important for the public service, village to village connection as well as connected to the whole world through information and communication technologies (ICT) and internet [15]. This study points out smart village governance in Tongke-tongke Village, East Sinjai Sub-district, Sinjai Regency, from June to August 2019. The

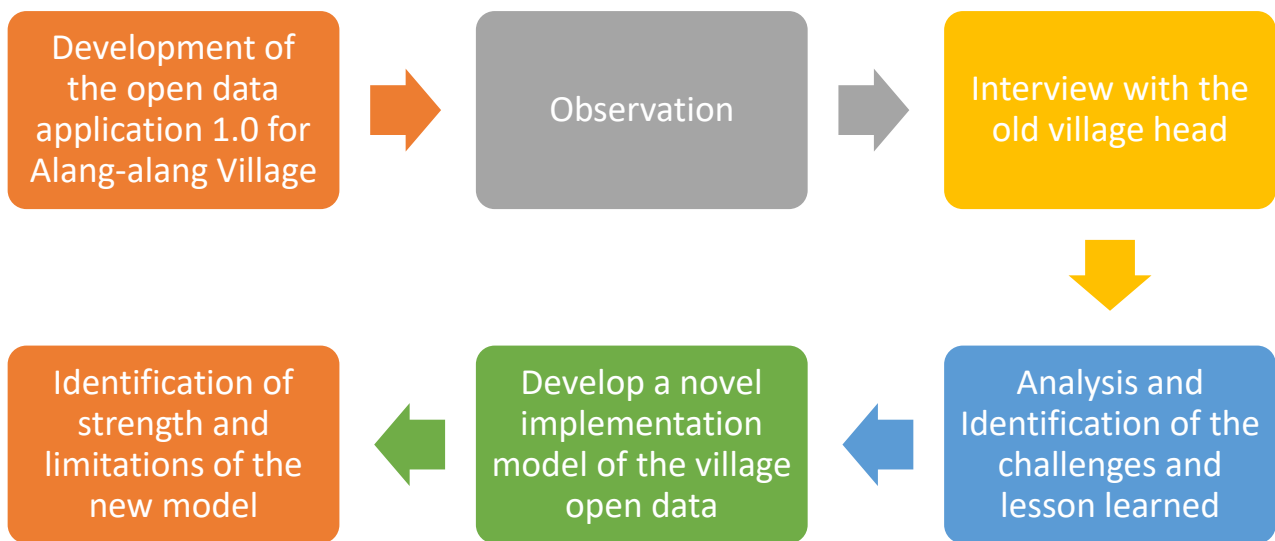


Figure 1. Step-by-step of the research

The research provided key policy and future recommendations about rural development for policymakers at the local, regional, national and EU levels [11]. The research points out the development of a smart village. To create a better society, it emphasizes resource efficiency, local self-government, access to ensure basic utilities, and responsible individual and communal behavior. Smart decisions using smart technologies and services are essential for a smart village [12].

This research examined the development of smart villages using technology and adapted PRISMA. Five smart village development fields are energy and water management, tourism, health, agriculture, and education. Energy management is the highest percentage of research numbers at 34%, and health is the lowest percentage at 3% [13].

This research reviewed the existing implementations of the SmartVillage concept and digital transformation for rural areas. This paper focused on EU policies as the existing framework for understanding the case study of Slovenian pilot practices and proposing the FabVillage concept. The research showed that rural areas are not uniform and

research utilized a qualitative research method with a phenomenology methodology.

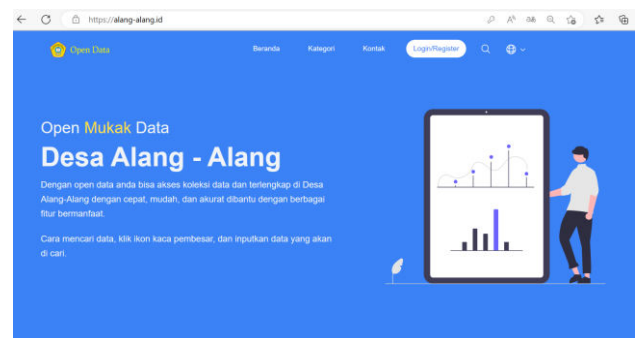


Figure 2a. Open data application for Aang-alang village in Bahasa.

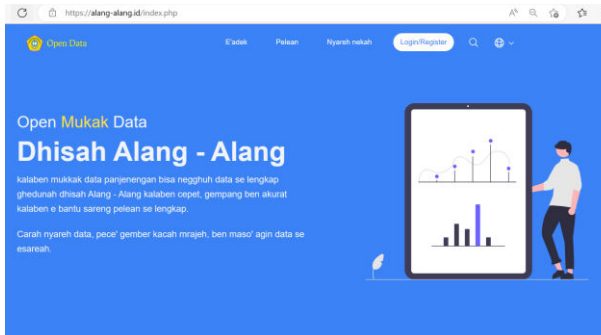


Figure 2b. Open data application for Alang-alang village in Maduranese language.

The research result found that the governance of Tongke-tongke village is still in progress towards a smart village implementation, especially in the smart mobility dimension. However, the village has a good commitment from the officials to implement good governance. Also, the village government provides funding to develop information technology and human resources to achieve a smart village vision [9].

This research was proposed the model of a smart village based on the case study in Banyuwangi. The developed smart village model consists of 6 dimensions as follows: (1) Governance, (2) Technology, (3) Resources, (4) Village Service, (5) Living, and (6) Tourism. Hopefully, the results of his research can be applied to other villages [16].

This research captured the implementation of Digital Village Projects (DVPs) in Kenya. Information and Communication Technology for Development (ICT4D) were implemented to empower the community economically. The project was assessed using the ICT4D assessment framework and its elements. Furthermore, the elements were tested using questionnaires, interviews, and observation data. The study's findings point to a number of issues that need to be addressed before this project can be implemented, including a lack of information literacy, awareness, DVP branding, service costs, and the lack of reasonably priced bandwidth. The study presented that adopting the framework for the projects could improve the project's beneficiaries [17].

3. Research Methods

There are some research stages, as presented in Fig 1. below. First, we developed and implemented the open data application 1.0 for Alang-alang village. After that, we observed the application's development and deployment. We also interviewed and discussed the open data implementation in the Alang-alang village, smart village, E-Government, and its challenges. Furthermore, we analyzed and identified the challenges and lessons learned from the case of Alang-alang village. Then, we developed a novel village open data implementation model based on the Alang-alang village case study. Moreover, we

identified the strengths and limitations of the novel model.

4. Analysis and Discussions

An open data application 1.0 in the Alang-alang village was developed and implemented in 2022. It is part of Alang-alang as a smart cyber village implementation as one of the old village head visions. Furthermore, it aims to publish data and documents about the village to improve transparency, and Alang-alang village can be known by the public.

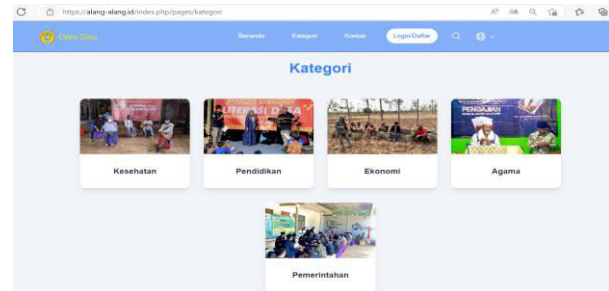


Figure 3. Data categories in the open data application

This application can be accessed at <https://alang-alang.id>, as shown in Fig 2. This open data application can also be accessed using Madura Language, as shown in Figure 2. This application contains data and documents about the economy, health, government, religion, and education as shown in Figure 3.

In the development stages, we interviewed and discussed the system requirements with the village head of Alang-alang, Bangkalan, Madura, and the village government staff related to the public service. We also presented and validated the system with the Smart Village Nusantara (SVN) unit of Telkom Group, e-Government experts from Universitas Negeri Sebelas Maret (UNS), and Information Technology (IT) practitioner from Life Media Yogyakarta to get more insights for the system improvements. The village head and the staff have fully supported implementing the open data application. However, it seems the people of the village still do not understand the importance of the application yet. Probably, it happened because of the educational background of the people.

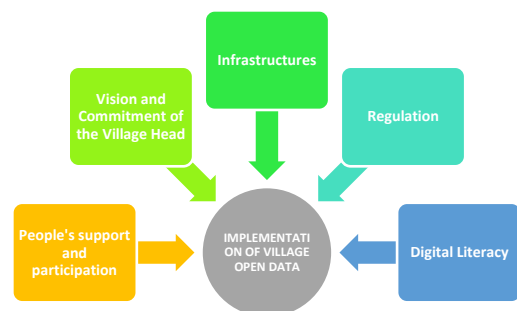


Figure 4. Success factors of the Village Open Data Implementation

Furthermore, there is controversy about the publication of village finance data. Therefore, the old village head did not run anymore for the village head election. Even though the old village head is one of the best village heads in Bangkalan, Madura. The Alang-Alang village was one of the leading smart villages in Madura and was well-known during his administration. The old village head was invited to many discussions on campus, on television, and in other forums to share about the village's governance.

The Figure 4 points out that the implementation of village open data needs some success factors as follows: Vision and commitment of the village head, it is important to direct and support the implementation of the village open data. Regulation is the product of the village head's commitment. As the law umbrella or law base, it is important for the village head or government to implement village open data through information technology.

A village can create and publish E-Government or Smart village regulations open data implementation is one of the points inside. People's support and participation. The people can be village citizens, village government staff, or the village empowerment body of the regency government. If the people support and participate in the village open data, the implementation will succeed.

Table 1. Strengths and limitations of this study

Strengths	Limitations
Based on the case study c the village Generic model	Based on the case study c Alang-alang village
Based on the last year implementation research	Bangkalan, Madura: an Indonesia
	Based on the one-year implementation of th village open data at th Alang-alang village Bangkalan, Madura: Indonesia
	Based on the Madura' people ethnic and culture
	Based on the Bangkala context and culture

Infrastructure, which can be IT, power supply, and internet, is important for the village open data implementation. Digital literacy, the village citizen needs digital literacy to access and understand about the open data application and implementation.

Currently, the village has a different person for the village head. We still do not know his vision of smart village, E-Government, and Village Open Data. However, the new village head has agreed to continue the second year of the research project to develop the open data application 2.0 for the Alang-alang Village.

5. Conclusions

In conclusion, the open data initiative in Alang-Alang Village represents a significant step towards promoting transparency, accountability, and innovation. By opening up government data, Alang-Alang Village aims to empower citizens, stimulate economic growth, and drive evidence-based decision-making. While challenges persist, the commitment of the government and stakeholders to overcome these obstacles signifies the transformative potential of open data in shaping the future of the village development. Open data promotes transparency by making government information and operations more accessible to the public. It enables citizens of Alang-Alang Village to scrutinize government activities, monitor public spending, and hold officials accountable for their actions. By providing access to datasets related to budgets, contracts, and public services, the Village Open Data initiative fosters a culture of openness, reducing opportunities for corruption and malfeasance. Future research will develop the open data application 2.0 for Alang-alang village as well as analyse the uniqueness, lesson learned, and challenges.

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