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Utilization Of Communication Information Technology In The Development Of Smart Villages

Abung Supama Wijaya[1], Pudji Muljono[2], Amiruddin Saleh[3], Dwi Retno Hapsari[4]

[1]Digital Communication and Media Study Program, College of Vocational Studies,

IPB University

[2,3,4] Department of Communication Science and Community Development,

Faculty of Human Ecology, IPB University

[1]abungsupama@apps.ipb.ac.id

[2]pudjimuljono@gmail.com

[3]amiruddin_ipb@yahoo.co.id

[4]retnokpm@apps.ipb.ac.id

Abstract – Literature review research related to the use of Communication Information Technology in developing Smart Villages in Indonesia from the perspective of development communication which has never been done before. The aim of this research is to analyze smart village studies in the 2018-2023 timeframe. The research method that has been used is Systematic Literature Review (SLR) with the PRISMA protocol for all research articles indexed in Scopus, Google Scholar, and Garuda. The search strategy is adjusted to the selection criteria and involves several variables related to publication research trends, education levels, journal indexes, research materials, and the type of evidence studied. The data obtained is presented in a quantitative descriptive manner. The results of this SLR research show that there are many studies on the use of Information and Communication Technology in developing Smart Villages. Still, only a few are related to the Development Communication perspective. The Department of Information Systems, Informatics Engineering, and Computer Science carries out most studies. However, there is still a lack of knowledge in the social humanities field.

Keywords – Smart Village, study of literature, utilization of ICT.

I. INTRODUCTION

The development of increasingly modern Information Communication Technology (ICT) has always been an exciting issue associated with the context of human life. The synergy between humans and technology is believed to solve various problems in sustainable development. The existence and development of ICT have a positive and significant impact on sustainable development [1,2]. ICT plays a role important in pushing development sustainable through several ways, including strengthening access to information and communication for everyone [3], improving efficiency and productivity for businesses and government [4], providing solutions For problem environmental and social [5], facilitating learning and education for everyone [6], and support more government transparent and accountable [7].

Disclosure of information is a demand in technological developments communication following Law No. 14 of 2008 concerning Public Information Disclosure. The Indonesian government is also fully committed to the use of ICT; this is related to the achievement of Sustainable Development Goals (SDGs) through Presidential Regulation (Perpres) number 59 of 2017, attachment to Presidential Decree No. 59 of 2017 concerning SDGs, Ministerial Regulation (Permen) No. 7 of 2018, and the

Corresponding Author: Abung Supama Wijaya

2021-2024 SDGs National Action Plan. The presence of ICT will specifically accelerate the achievement of the SDGs targets in 2030. The implementation of SDGs in Indonesia has challenges, including communication, financing, and preparing regions to adopt and implement SDGs. Of course, in this case, the collaboration of all stakeholders is needed, namely the central government and village government, the community, academics and practitioners, the media and community organizations.

Utilization of ICT is currently not only needed in urban areas but also in rural areas. Several villages have begun to increase the potential of natural and human resources and build capacity to carry out sustainable development with various areas that are the goals of rural development, including tourism, agriculture, agro products, e-village and rural entrepreneurship [8]. The use of ICT in village areas has been mandated by Law No. 6 of 2014 to be fulfilled by the Regional Government and the Central Government. So, ICT and its supporters also need to be prepared to make villages have fast, efficient, transparent governance while adhering to local wisdom. Furthermore, the essence of Law Number 6 of 2014 gives authority to the Village Head to be more independent as an object and a subject of development. Further, the implementation of e-government village administration in information disclosure makes more use of Information and Communication Technology, especially in information services to the public. Villages that already utilize ICT are often called Smart Villages or Smart Villages.

A Smart Village is a village that can manage resources and assets to develop new opportunities both in traditional and digital technology to create better telecommunication, innovation and use of knowledge. The Smart Village program aims to accelerate the transformation of village development that is powerful, independent, prosperous and democratic through the use of technology. The Smart Village concept assumes that social life is combined with technological advances.

The Smart Village concept is a development based on the sustainable use of information technology. If successfully integrated with initiatives, it can create new possibilities to increase income, improve services and strengthen local communities in general, which ultimately increases the community's quality of life to achieve a Smart Village. Will support the SDGs program in the rural area.

Smart Villages benefits include increasing community awareness, knowledge and skills in utilizing digital technology to create an innovative economy and improving digital infrastructure facilities to achieve smart mobility in villages. The six pillars of a Smart Village are an innovative society, an innovative economy, smart governance, a bright environment, intelligent life and mobility.

This research is relevant to the bibliometric analysis approach, which needs further development using this analytical model. Being able to monitor the development of scientific publications related to smart villages in 5 years (2018-2023), this strategy is to create sustainability in using ICT in building Smart Villages, especially in Indonesia. One form of communication currently being developed for researchers is the publication of scientific journals. This is because scientific journals have indexable data in scientific databases. The analysis is needed to obtain specific information and data related to research topics from scientific journal databases.

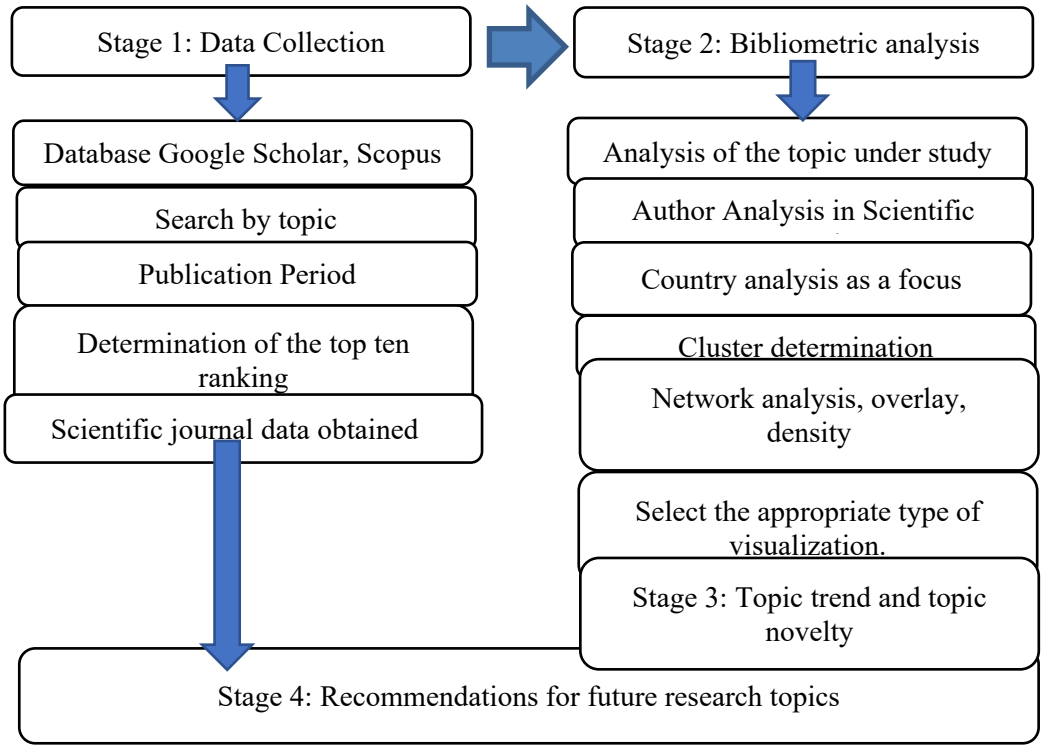
The formulation of the problem developed in this research is how the theme of using ICT in building Smart Villages on any novelty topics obtained in research development. The mapping of knowledge obtained from scientific articles published in scientific journals is expected to be relevant to current needs, especially in the scientific perspective of development communication, so it has a novelty that can be further investigated to support the development of sustainable, intelligent villages in Indonesia.

II. Research Methods

This Study uses Systematic Literature Review. Analysis of large amounts of scientific data in the development of scientific research is currently in the form of bibliometrics. This analysis is through the application of appropriate procedures and techniques in analyzing specific topics helpful in developing science. Scientific publications using bibliometrics are closely related to the growth of scientific research. This analytical method can describe the development of scientific knowledge in specific fields by utilizing bibliometric tools to provide in-depth investigations related to the themes studied qualitatively. The analysis technique in this study used bibliometric analysis using the VOSviewer program based on the theme of Utilization of ICT for village development.

The initial step in this analysis is the collection of databases from various sources of scientific journals so that various journals relevant to the proposed theme are obtained. It furthermore, uses the VOSviewer program to manage and display scientific journal analysis. Displaying visualization of data search results, visualizing bibliometric networks composed of publications that have been collected, obtaining visualization of display results that are easy to learn and finally, describing network patterns and density to explain concepts or theories in the database.

Research data searched through the Harzing Publish Or Perish Program with Scopus and Google Scholar coverage was conducted in January 2018-2023. The selected scientific journal database considers various published articles limited to the desired research theme. A search through Google Scholar found several articles that used the keywords "ICT Utilization, Smart Village" and " ICT, Smart Village". The stages are carried out in this bibliometric analysi



The selection process resulted in 2000 journal articles subjected to bibliometric analysis and systematic review. A selection was made to minimize errors and inconsistencies originating from the database of scientific journals obtained, including errors in disbursement. The framework that will be used is a reference in searching scientific articles as primary referring to the stages of analysis and adapted to the flow developed in this research article. Search and search process journal scientific refers to the topic that will be examined, namely the use of ICT in the development of Smart Villages with order step started from data collection, analysis bibliometric, trend and novelty analysis topic that has relevance with researched topics, and recommendations possible topic used for research to come. Framework thought presented own relevance with development stages in do study the literature referred to as the preferred reporting items for systematic reviews and meta-analysis (PRISMA) comprises criteria feasibility, source information, selection literature, data collection, and data selection.

III. Result And Discussion

The concept developed on the theme of using ICT in village development is presented in a visualization. Articles indexed by Google Scholar (n = 2000) with details of 1000 with the keyword ICT Smart Village and another 1000 with the keyword ICT smart village. Publication starts from 2018-2023 over a period of 5 years to see research trends related to the use of ICT in smart villages. the data obtained from Harzing's publish and perish can be seen that there is an average for the ICT Smart Village keyword of 19820 while for the Smart Village ICT Utilization keyword there are 2457 *citations.*

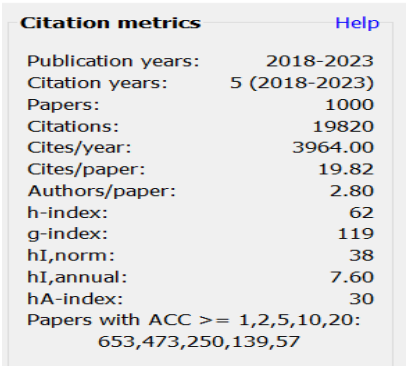


Figure 3. Search results via Google Scholar with the keyword ICT Smart Village

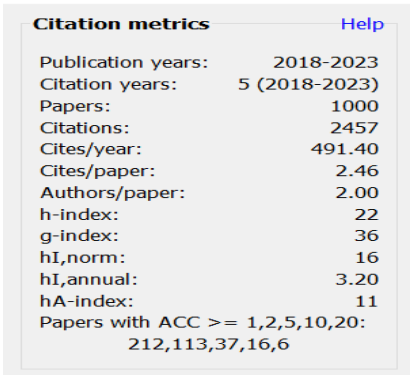


Figure 4. Search results with the keyword Utilization of ICT, Smart Village

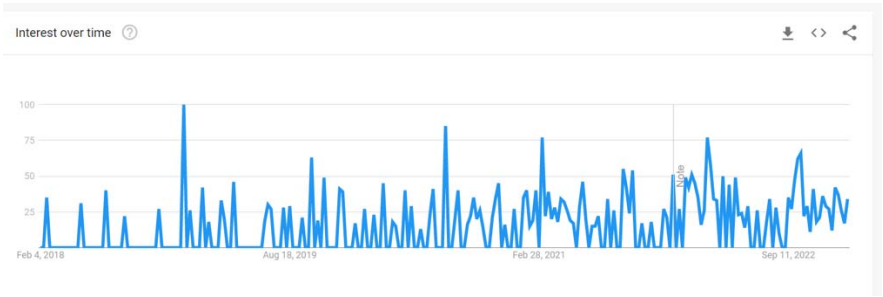


Figure 5. Search results via Google Scholar with the keyword ICT Smart Village

On Google, search trends related to the Smart Village keyword are still high, although they still seem to fluctuate every month throughout 2018-2023.

Figure 6. Google Trends Smart Village

On Google, search trends related to the Smart Village keyword are still high, although they still seem to fluctuate every month throughout 2018-2023. From the two search trends on Google, it can be concluded that there is still high search interest related to smart villages and Smart Village . In addition to looking at search trends for smart villages and smart villages for indexing purposes, this can help identify themes and trends in various research fields. Through Vosviewer used density and

analyze the keywords used through the database collectively. The results of the research related to the article using VOSviewer contained 6 clusters based on the concepts found identification of the concepts and themes to be studied were expressed by describing the appearance of the cluster density level which could be projected to determine the most influential concept of each cluster. Color codes will help identify themes that are often discussed in various studies that have been published in various scientific journals.

Keywords included in database titles, abstracts and journal publication materials were applied to highlight topics focused on ICT use, Smart Village and smart villages. In the map view, the node size indicates the presence of keywords with a dominant number. The closeness of the nodes and the thickness of the connected lines can indicate the strength of the occurrence of keywords. The color of the nodes that appear on the map represents groups of keywords that contain elements based on occurrence words or combinations of words that can be used as research topics for research. The keywords selected from the network visualization in Figure 7 show that several keywords often appear and are widely used in research. Some keywords are often used when researching a topic.

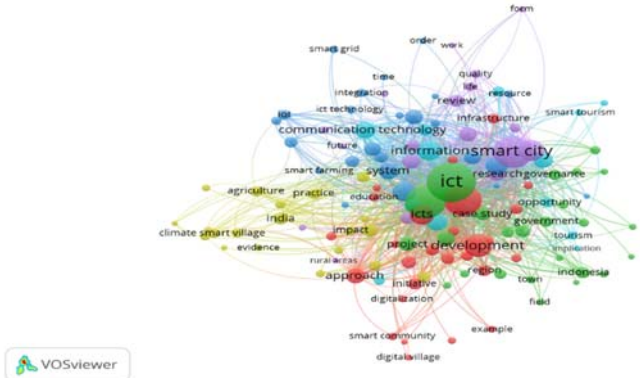


Figure 7. Visualization of the Smart Village network

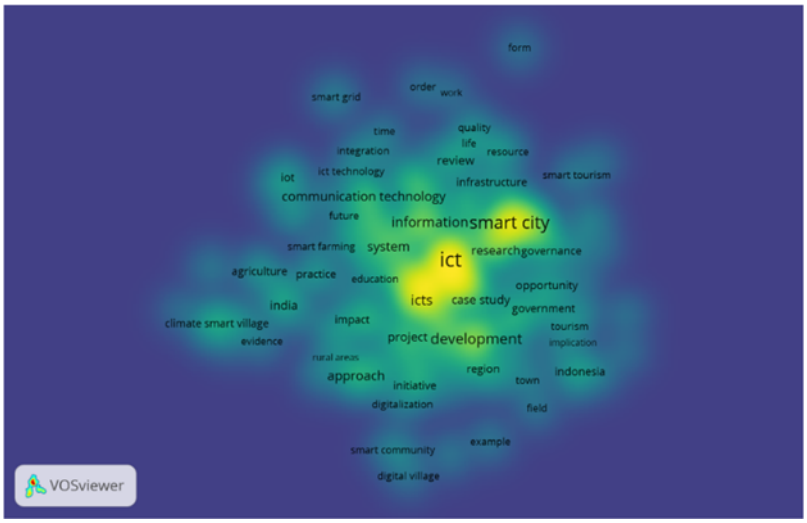


Figure 8. Visualization of Smart Village density

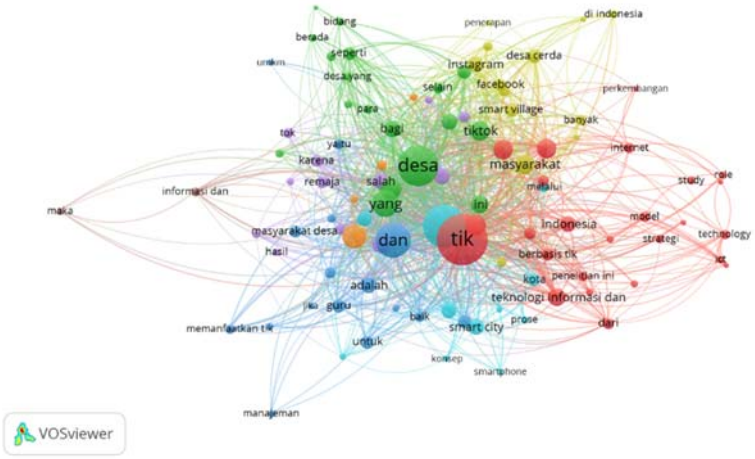


Figure 9: Visualization of the Smart Village Network

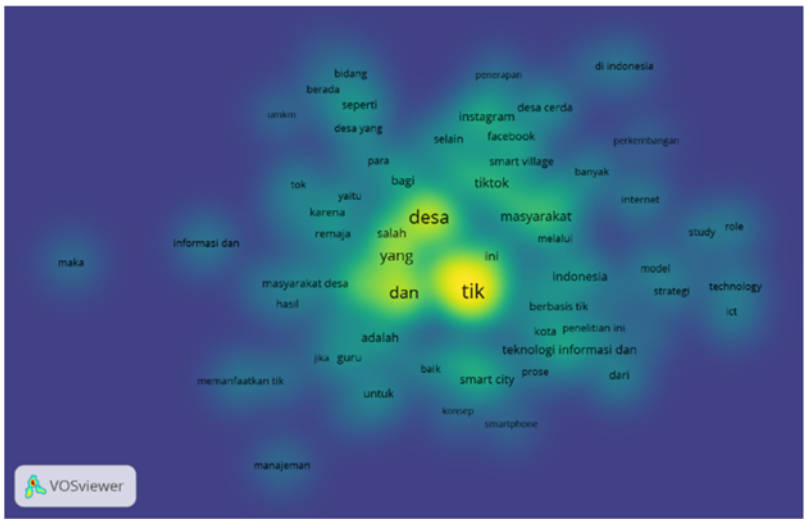


Figure 10: Visualization of of Smart Village density

Density visualization elements are known to have color nodes that indicate the density level of the element. The color sequence that describes the visualization of density from low to high density starts from blue to green then yellow. The higher the number of items and the heavier the item, the closer the color tends to be yellow. Conversely, the smaller the number of goods and the lighter the weight of the goods, the bluer the color. Figure 3 shows a visualization of the density of many items and several high-weighted items or keywords, such as ICT, technology, smart village and ICT, Village, community. by VOSviewer can show the distribution of research and knowledge. Several items with yellow knots mean there are many

Table 1. Smart Village cluster topics (International article)

Cluster	Topic concept	Total items
1	Access, approach, development, digital village, ict infrastructure, rural development, smart village, sustainability	27
2	Case study, communications technology, ICT, Indonesia, governance, government, smart city development, smart economy, smart governance, smart village model, village.	26
3	Application, big data, concept, data effort, framework, ict technology, internet, smart farming	24
4	Adoption, agriculture, climate change, climate smart agriculture, climate smart village, evidence, impact, smart village concept	20
5	Analysis, citizen, city, future, management, quality, rural area	18
6	Challenge, communication technology, community, definition, implications, smart technology, smart tourism	13

Table 2. Smart Village cluster topics (national article)

Cluster	Topic concept	Total items
1	ICT-based, ICT, Indonesia, Information, internet, technology development, strategy	25
2	Village, field, tiktok, use	18
3	Village community, utilizing ICT, sub-district	16
4	Tiktok, smart village, Indonesia, facebook, instagram, village apparatus, smart village, youtube	13
5	Teens, results, smart tiktok	13
6	Technology-based, smart, district, smart city, smartphone	11
7	Tech-capable village	4
8	Information	2

Mapping identification through cluster topics can help researchers to start research that can be tailored to research needs. Efforts to find interesting topics can be done by reading various articles related to the desired topic by looking at the identification developed in the research being carried out. Cluster 1 explains concepts related *to access*, *approach*, *development*, *digital village*, *ICT infrastructure*, *rural development*, *Smart Village*, *sustainability*, while cluster 2 explains *case study*, *technology communications*, *ICT*, *Indonesia*, *governance, government*, *smart city development*, *clever*. Furthermore, in the case of cluster 3, the concepts developed include *application*, *big data*, *concept*, *data effort*, *framework*, *ICT technology*, *internet, smart farming*, and for cluster 4, *adoption*, *agriculture*, *climate change*, *climate smart agriculture*, *climate smart village*, *evidence*, *impact*, *Smart Village concept*. In more detail, cluster 5 focuses on *the concepts of analysis*, *citizen*, *city*, *future*, *management, quality*, *rural area* while cluster 6 focuses on the *concept of Challenge*, *communication technology*, *community*, *definition*, *implications*, *smart technology*, and *smart tourism*.

Table 3. Ranking of articles discussing Smart Village (International article)

Article title	Researcher	Journal Source	tc	CPY
What makes a smart village smart? A review of the literature	[9]	https://www.emerald.com/insight/content/doi/10.1108/TG-07-2021-0126/full/html	6	6.00
How Do Smart Villages Become a Way to Achieve Sustainable Development in Rural Areas? Smart Village Planning and Practices in China	[10]	https://www.mdpi.com/2071-1050/12/24/10510	36	12.00
The Smart Village Model for Rural Areas (Case Study: Banyuwangi Regency)	[11]	https://iopscience.iop.org/article/10.1088/1757-899X/722/1/012011/meta	54	18.00
Systematic Review and Meta-Analysis of Proposed Smart Village Conceptual Model: Objectives, Strategies, Dimensions, and Foundations	[12]	https://ieeexplore.ieee.org/abstract/document/8696029	39	7.8
A Trend on Smart Village and Implementation of Smart Village Platform	[13]	https://koreascience.kr/article/JAKO201927561417766.page	20	5
Defining smart city, smart region, smart village, and techno polis as an innovative concept in Indonesia's urban and regional development themes to reach sustainability	[14]	https://iopscience.iop.org/article/10.1088/1755-1315/202/1/012047/meta	70	14.00
Development of Smart Village for Strengthening Smart City and Smart Regency	[15]	https://apic.id/jurnal/index.php/jsc/article/view/9	59	11.80
Smart Villages in the EU and Beyond	[16]	Emerald Publishing	42	10.50
Developing a Smart Village Model for Village Development in Indonesia	[17]	https://ieeexplore.ieee.org/abstract/document/8549973	42	8,4
Smart Village Initiatives: An Overview	[18]	https://link.springer.com/chapter/10.1007/978-3-030-37794-6_1	13	4.33

Table 4. Ranking of articles discussing Smart Villages (national article)

Article title	Researcher	Journal Source	tc	CPY
The Smart Village Model for Developing Indonesia	[19]	Shia kuala university Press	8	4.00
Going to Village Smart: Study Village Development Case tile on Sumedang, West Java, Indonesia	[20]	Society	0	0
Development of the Indonesian Smart Village Model: Systematic Literature Review	[21]	Journal of Information Systems, Graphics, Hospitality and Technology	0	0
Development Village Based on Smart Village (Study of Smart Governance on Village Prime Services Talagasari Karawang Regency)	[22]	Moderate: Scientific Journal of Governance	16	5.33
Initiation Development of a Smart Village Based Model Wisdom Local And Community Empowerment	[23]	Proceedings of Semnas LPPM Unsoed	0	0
Village Model: A Case Study in the Kotayasa Village and Karanggintung Village, District Donate, Banyumas District	[24]	Proceedings of Semnas LPPM Unsoed	0	0
Dissemination and implementation of the smart village program in the Benai District, Kuantan Singingi Regency	[25]	Unri Conference Series: Community Engagement	1	0.25
Technology, Sustainability Neighborhood, and Village Tourism in Indonesia	[26]	Journal of Islamic economic law research	1	0.50
Socialization and Introduction The Smart Village Concept in Sungai Pinang Village, Rambutan District, Banyuasin Regency	[27]	Independent Service Journal, Bajang Journal	0	0

In table 3, the discussion in the ranking of scientific articles in the database with the keywords smart village and ICT research explains how the current definition and characterization of a smart village is shaped by disciplinary background and geographical context. Smart Village is often seen as a rural version of a smart city or an innovative model for rural development [9]. In its division, the Smart Village System consists of five subsystems that perform different functions, namely strategic subsystem, social subsystem, economic subsystem, resource subsystem power and environment, and the information subsystem [28]. Smart Village refers to concepts developed in rural areas that provide solutions to problems that occur and improve the quality of life. The main problems faced by rural areas include poverty, low levels of education, and limited access to technology by sight It is hoped that the smart village trend abroad will learn about the smart village platform that manages Smart Villages efficiently through the necessary technology for Smart Villages [29]. The proposed Smart Villages model is categorized into six dimensions including 1) Governance, (2) Technology, (3) Resources, (4) Village Services, (5) Life, and (6) Tourism. It is hoped that this research can be applied to villages in other districts by adjusting the characteristics of each region [30].

In table 4 the discussion in the ranking of scientific articles in the database with the keywords Smart Village and ICT explains that the proposed smart village model is categorized into six dimensions including 1) Governance, (2) Technology, (3) Resources, (4) Village Services , (5) Life, and (6) Tourism. It is hoped that this research can be applied to villages in other districts by adjusting the characteristics of each region. (Fatimah et al., nd-a) then some database search results explained that publication articles related to smart villages were the output of community service carried out by academics in building smart villages in several village areas.

The arguments in this article explain that rural areas are not uniform, and that smart rural development must be implemented in combination with a place-based approach. Several other articles explain how to implement a smart village in an area so that it can be concluded that the implementation of a smart village in each village cannot be uniform, this is related to village conditions, and also local wisdom in the village. Table 6 shows that many of the articles cited are scientific articles originating from community service activities, so there are very few articles from Indonesia that discuss smart village development. Most of the articles are from informatics science and information systems. In the analysis of all the articles above, novelties that can be researched in the social field can be taken, including:

Figure 11: Novelty of research in the field of development communication

Six new topics were generated in this study in the development of the Smart Village theme including Leadership, Communication Media, Community Empowerment, Culture, Social Change, Community Participation. The novelty of the topics that were discovered became an important part of the development of science, especially in the study of development communication.

IV. CONCLUSION

Based on review related scientific articles with databases smart village and smart village in context development Village Intelligent experience a number of problem including : 1) Access limited information: a lot public still rural own access limited to information and sources power, so difficult in communicate in a manner effective benefits and opportunities development about village Intelligent [31,32]; 2) obstacles culture and language : barriers difficult culture and language message communication development for understood and acted upon by the community rural [33]; 3) Limited participation: No good communication, maybe difficult for involve public local in planning and implementation development Smart Village, which causes lack of ownership and sustainability public [34]; 4) Limited understanding about draft Village Smart: People who live in rural areas Possible own limited understanding about draft Village Smart and useful for they [20], [35]; 5) Limited budget For activity communication and improvement awareness: developing and implementing an effective communication strategy can be expensive, and funding is limited can limit ability for in a manner effective communicate benefit development Smart Villages [36]. Obstacles the can minimized even overcome with use of communication media proper development. Selection of the right development communication media will help facilitating government programs to develop Smart Villages in various regions of Indonesia. Media and ICT, if used with right, can used in a manner effective for help development [37].

Analysis bibliometric is one method scientific with approach capable retrospective analyze various factor in a manner complex with wide data coverage. Profit utilization analysis bibliometric as effort for get scientific data through development scientific can done relatively more easy although use large amount of data and have level high complexity. Publication analysed articles with utilise method bibliometric conclude that draft Smart Village development must be supported by smart people who can understand the concept of using ICT which can improve life in the economy, social, governance, environment, life and smart mobility.

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