

## Research Article

# Youth in Pentahelix Collaboration Towards a Smart Village

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**Abstract.**

The industrial revolution 4.0 has triggered significant changes in various sectors, including at the rural level. One response to these changes is the implementation of the Smart Village concept, which emphasizes information technology-based village governance. Realizing a smart village requires human resources with specific skills, which are often difficult to find in villages. Therefore, the involvement of various actors through the pentahelix collaboration scheme, which includes the government, academia, businesses, the community, and the media, is crucial. Youth, as the digital native generation, have a central role in driving this transformation. This research aims to analyze how a pentahelix collaboration works in the development of a smart village in Bira Village, Indonesia, as well as explore the role of youth in the collaboration. Bira Village was chosen as the research location because it has undergone a digitalization process over the past few years. The method used was descriptive qualitative, with interviews and document studies as the main techniques of data collection. The research adopted a framework that includes six smart village dimensions, namely smart people, smart economy, smart environment, smart governance, smart mobility, and smart living, to achieve the research objectives. The results show that a pentahelix collaboration is strongest in the smart people and smart economy dimensions. In other dimensions, collaboration does exist, but it does not optimally involve all stakeholders. The role of youth is highly visible in the smart people, smart governance, and smart economy dimensions, but less prominent in the other dimensions.

**Keywords:** youth, pentahelix collaboration, smart village

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## 1. INTRODUCTION

The industrial revolution has brought changes to the implementation of development towards society 5.0. This concept offers a human-centered society based on technology [1]. According to [2], Society5.0 is a concept where the development of the Internet of Things, Big data, and Artificial Intelligence is oriented towards a better human life. Historically, Society 5.0 is a concept proposed by keidanren, which is a Japanese



business federation. A Japanese government definition of Society 5.0 is “A human-centered society that balances economic advancement with the resolution of social problems by a system that highly integrates cyberspace and physical space”. That is, “a human-centered society that balances economic advancement with the resolution of social problems by a system that highly integrates cyberspace and physical space” [3].

The goal of Society 5.0 as cited by [4] is to create a human-centered society where economic development and solving social challenges are achieved, and people can enjoy a high quality of life that is fully active and comfortable. It is a society that will pay detailed attention to the various needs of people, regardless of region, age, gender, language, etc. by providing necessary goods and services. The first issue to be reviewed in Society 5.0 is Cities and Regions. In this sector, there are several issues that need to be resolved, especially societal issues. In the information age, technological advances support people in urban areas by encouraging increased productivity through the utilization of information technology services. However, rural areas are missing out on these benefits, resulting in a science and technology gap that ultimately also results in a welfare gap [3].

In response to this phenomenon, Carrasco-Saez [5] proposed contextualizing smart cities to solve rural problems. The contextualization gave birth to the concept of smart village. Although there is no single understanding of the smart village concept, in general, a village can be said to be a smart village if the village innovatively uses information technology to achieve improved quality of life, efficiency and competitiveness in economic, social and environmental aspects [6]. In the midst of the onslaught of digitalization in all fields, technological progress will not be perfect if it is not accompanied by preparing superior human resources. One of the steps to create superior human resources in the Society 5.0 era is to build a Smart Village [7].

Smart villages are certainly not an easy thing to realize. This idea requires support from various parties. The penta helix model is very useful for solving multi-stakeholder problems where stakeholders represent various interests in one location [5]. In the Pentahelix Model, there are five elements that become actors building the identity of an area, namely the government, academics, private sector, community, and media [8]. In addition, smart villages require the ability to adapt to technology, which is often not owned by many village officials. Youth as digital natives can take a role in this regard. The role of Indonesian youth is needed to achieve the goals of society 5.0 by collaborating with the penta helix model.

There are many studies that have been conducted on the role of rural youth in facing the era of society 5.0. One of them was conducted by Widyawati, Ahmad Farouq Mulku Zahari, Firdaus, Maulid, Murni Ratna Sari Alauddin, Sapriyadi, and Muhammad Syaiful in 2022. This research was conducted in Hakatutobu Village, Pomala District, Kolaka Regency, Southeast Sulawesi. This research was conducted in the form of community service, namely providing an understanding to youth in Hakatutobu Village, Kolaka Regency of the important role of youth in development, and providing insight into development in the era of society 5.0. So that with this activity the village youth have an understanding and awareness to support village development towards the era of society 5.0. Through this activity, the village youth were also given input to think more critically, optimize the function of youth organizations, and participate in development activities. The methods used in this activity were lecture and discussion. From the results of the discussion, it was found that the lack of involvement of youth in village development is due to the parents' lack of trust in their abilities. Karang Taruna as a forum to channel the creativity of the village youth, in determining members is not done openly. The selection of members is based more on kinship factors. In addition, the Karang Taruna board has been less active in conducting meetings to discuss activities that must be carried out. The members of the youth organization basically do not understand their duties as members of the organization. Youth in Hakatutobu Village, Pomala Sub-district, Kolaka Regency are less skilled in using laptops/computers.

In addition, research on the collaboration of the penta helix model in realizing smart villages was conducted by Kelvin, Ida Widianingsih, R. Achmad Buchari in 2022. The research was conducted in Pondok Ranji Village, East Ciputat District, South Tangerang City. This research approach uses a qualitative descriptive approach. Data sources in this study were obtained using observation techniques, interviews and secondary data analysis from literature reviews and related agencies. The results showed that the role of each penta helix actor in realizing a smart village in Pondok Ranji Village needs to be optimized. Based on the analysis conducted, the dominant actor in the implementation of Smart Village in Pondok Ranji Village is the community or community actor, but has limited resources so that the role of other actors is needed specifically and systematically. The efforts in realizing the smart village in Pondok Ranji Village will be optimal if implementing a collaborative government with a penta helix model.

Bira Village, Bulukumna Regency, was chosen because this village has carried out a lot of digital transformation, especially in the public service sector. In the process of digital transformation, this village has collaborated with many parties. In addition,

Bira is a village with huge tourism potential. Tanjung Bira in this village is one of the most famous tourist destinations in South Sulawesi. Even so, the village still faces the challenge of economic empowerment, especially for the youth. Many village youth prefer to leave the village to find work. This is certainly a challenge in developing smart villages in the village.

Based on the studies and problems that have been described, this research aims to describe how penta helix collaboration in realizing smart villages in Bira village, Bulukumba district and how the role of youth in the collaboration. this research is expected to provide additional knowledge and input to all penta helix actors (Government, Academics, Community, Businessmen and Media), especially the youth community in Bira Village, Bulukumba Regency.

## 2. THEORITICAL STUDY

According to Soemaryani [9] The pentahelix model is a reference in developing synergy between agencies to achieve goals. The penta helix collaboration model involves 5 (five) actors, namely academics, business, society, government and media [5]. Pentahelix is an innovative model of development from the QuadrupleHelix model that connects Academics, practitioners/businesses, Communities, Government and Media to create an ecosystem based on creativity and knowledge, where what is expected from this concept is a solution for the development of creativity, innovation and technology in the creative industry [10]. The government acts as a regulator and is responsible for planning, implementation, monitoring, budget allocation, licensing, programs, policies, innovative knowledge development, and support for public-private partnership networks. Academics are the conceptors of knowledge sources. The private sector is the entity that runs the business process in creating added value, providing technological infrastructure and capital through corporate social responsibility mechanisms. The community acts as an intermediary between stakeholders to assist the community in the whole process. The media plays a role in supporting publications and carrying out socialization functions to the community as cited by Wahyuningsih et al. (in [11]).

This pentahelix model will be used to look at the roles of actors in all dimensions of smart villages. Smart villages are rural areas and communities that build on existing strengths and assets as well as new opportunities to develop added value and with traditional and new networks enhanced through digital communication technologies, innovation and better use of knowledge for community benefits [12]. The smart village

proposed by Viswanadham [5] pays attention to the urgency of providing public services based on the smart village ecosystem framework. Understanding the dimensions of smart villages is similar to understanding smart cities, smart villages have 6 (six) dimensions, namely smart people, smart environment, smart economy, smart government, smart mobility and smart living [5].



**Figure 1:** Smart city & Smart village dimensions. (Source: [5]).

### 3. METHOD

This research uses a descriptive qualitative approach. Descriptive qualitative according to Mohajan, Haradhan [13] is research that examines natural social action events emphasizing how people interpret, and understand their experiences to understand social reality so that individuals are able to solve their own problems. This research aims to analyze the role of youth in penta helix collaboration in the smart village of Bira Village, Bulukumba Regency, Bonto Bahari District, Bulukumba Regency, South Sulawesi. This research was conducted for 1 (one) month, from July 26, 2023 to August 31, 2023. The data sources used were primary data and secondary data. Primary data is direct data obtained through direct interviews with informants. In this research, the primary data sources are 2 (two) youths of Bira Village (Jeri Wirawan as the administrator

of the Bira Student Association and Andi Ariel Firdani as a high school youth in Bira Village). Furthermore, researchers read various sources that have been collected and critically examined, where various data relevant to the problems studied are then taken, processed and concluded in accordance with the applicable systematics, so that in the end it will produce a research report.

## 4. RESULT AND DISCUSSION

Youth in the penta helix model is included in the community/community group. To find out more deeply the role of youth in penta helix collaboration in Bira Village, Bulukumba Regency, the following results are further discussed by analyzing the role of youth in each of the 6 aspects of smart villages as presented in the literature review section. The results and discussion that researchers get from the results of the research conducted are as follows:

### 4.1. Smart People

Smart people are conditions when cities and districts provide and provide opportunities for improving the quality of human development through formal and non-formal education and opening up spaces for citizen creativity. The work areas of smart people include: 1) education infrastructure, 2) education level, and 3) creativity [1]. Based on the results of the interview on August 15, 2023, the researcher asked the informant about access and quality of education in Bira village, and the informant said that “access to education and the quality of educational facilities and infrastructure in Bira village are quite adequate, we also at KPMB always hold positive activities with students in Bira village, such as holding tartil and recitation competitions, cultural dialogues and many other activities” said Jeri Wirawan, manager of the youth organization Kerukunan Pelajar Mahasiswa Bira (KPMB).

Educational creativity in Bira village is also evidenced by the activities: Fun Day Smart with Forum Anak Bulukumba held by Forum Anak Panrita Lopi Bulukumba on June 26 and 27, 2018. The activities carried out were socialization of children's issues, learning together, sports together, and traveling on Bira White Sand Beach. The activity was attended by Unicef Anti Bullying Facilitators in collaboration with the Office of Women's Empowerment and Child Protection, Alumni from the Panrita Lopi Bulukumba Children's Forum board and several Children's Forum administrators in Bulukumba

District [14]. The activity is a form of non-formal education provided to children in Bira village in a quite creative way. In addition, the Bulukumba District Government launched the Returning Children to School Movement and the Integrated Adolescent Girls Strengthening Program in Bulukumba District, the program is an effort to accelerate the handling of out-of-school children as a form of cooperation between the South Sulawesi Provincial Government and Unicef, the purpose of this program is to encourage out-of-school children to get a second chance to get a proper education through the Out-of-School Children Development Movement and the integrated adolescent girls strengthening program [15].

Based on the results of the study, there is a penta helix collaboration model in realizing smart people in Bira village, starting from the role of government, community/community, business people, academics and also the media. The role of youth in this penta helix collaboration can be seen with the Panrita Lopi Bulukumba Children's Forum which organizes creative educational activities and also the Bira Student Student Association which always supports positive activities in supporting smart people in Bira Village, Bulukumba Regency. Therefore, Bira Village has made various efforts in realizing smart people.

## 4.2. Smart Living

Through Smart Living, the internet can be transformed to help create a more decent life, including access to good health and housing facilities [16]. Based on the results of interviews conducted by researchers, informants said that "there is a tourist health center provided for tourists and doctors are provided every Sunday, besides that health services can also be accessed via the internet network" said Jeri Wirawan, Bira Village youth (Interview August 15, 2023). Based on data from the Central Bureau of Statistics in 2020, Bira Village has 1 (one) auxiliary health center, 1 (one) Poskeslu, 1 (one) Polyclinic/Medication Center and 4 (four) Posyandu. In addition, the Bira Village Government has conducted training for community health cadres related to the role of posyandu and KPM in Bira Village on August 01, 2023. During the training, Ms. Andi Dewi Ratu as the head of the institutional and social culture of the community said that each Posyandu must have complete and standardized equipment such as digital scales and a tool to measure blood pressure [17]. Meanwhile, to discuss stunting in Bira Village, the Bira Village Government conducted a Village-level Stunting Meeting in 2023 which was attended by the Head of the Community Institutional and Socio-Cultural



Division of the Village Community Empowerment Service A. Dewi Ratu S.STP, M. Si, Village Facilitator, PMD TA Andi Nurhayati, Head of UPT DP2KBP3A Darman, P3MD TA Hamzah, Nutritionist of Puskesmas Bontobahari Nuridah, Village Midwife, Village Nurse, Posyandu Cadres in Bira Village, KPM Cadres, Village Officials and Staff and mothers of toddlers on July 25, 2023. In this activity, the Head of UPT DP2KBP3A said that there needs to be stunting handling activities in the village such as construction / rehabilitation of Poskesdes / Polindes and Posyandu, counseling and provision of healthy food to improve toddler nutrition, health care for pregnant and lactating mothers, construction of sanitation and clean water, construction of MCK, training and development of cadres[18].

Meanwhile, the Bulukumba Health Office assigned the Public Safety Center (PSC) Team to post at Tanjung Bira over the weekend. The presence of the PSC Team is to provide emergency services if there are visitors or local residents who need medical help. For your information, the Bulukumba Regency Government continues to improve services to the community. One of them is PSC which is the spearhead of emergency services in Bulukumba Regency. PSC is ready to serve the community for 24 hours. Accessing it is now very easy, just press 119 on the cellphone screen, and the community can be directly connected [19]. The Bira Village Government also collaborated with Telkom to carry out Technical Guidance (Bimtek) to all Posyandu cadres from four Posyandu in Bira Village regarding the Introduction of Posyandu Features in Sempel Desa. The four Posyandu include Posyandu Rabbit (Pungkarese Hamlet), Posyandu Kancil (Birakeke Hamlet), Posyandu Rusa (Tanetang Hamlet) and Posyandu Kerapu (Liukangloe Island Hamlet), on Friday, December 16, 2022. Through the zoom application, Mr. Iwan as the resource person at the activity explained and taught all Posyandu cadres present how to use the posyandu features in Sempeldesa. Some of the features are first the posyandu profile data feature which functions as a posyandu database which includes posyandu list data, targets, dasawisma, to posyandu activities including stunting reports. Second, the information system feature is used to record posyandu activities and data that can replace the function of the KIA book. Third, the stunting report feature which functions as data for posyandu performance reports including Human Development Cadres (KPM), Family Data, Stunting Data. With this application, he hopes that in the future Posyandu cadres will no longer record manually because everything must be digital and of course by using the Sempel Desa application [20]. Based on the results of this research, there are government efforts to realize smart living in Bira Village, namely by providing a Tourism Health Center, adequate health facilities, and health services that are also based on digital technology. Penta helix



collaboration has also been found, namely the village government working together with various other government agencies, but the role of village youth has not been optimized in supporting the realization of smart living in Bira Village.

### 4.3. Smart Environment

Smart Environment aims to overcome various environmental problems. The environmental problems in question are sanitation problems, air cleanliness, garbage, global warming, carbon emission problems, availability of child-friendly public spaces, availability of parks, and so on [21]. Based on the findings of researchers, environmental conditions, especially in the Bira Port area, still lack of greenery in the port area and the unkempt marine environment in the dockside area, causing air circulation to be disrupted because the exchange of oxygen with CO<sub>2</sub> in the port area is very unhealthy. This is also able to reduce the attractiveness and comfort of the visitors themselves due to environmental conditions that are not maintained and not well organized [22]. In addition, the beauty of Tanjung Bira Beach was damaged by the large amount of garbage that was piled up due to an increase in visitors during the Lebaran 2022 holiday, the garbage that was piled up was due to public awareness to dispose of garbage in its place was still very low [23]. In Bira Village, there is also the Bira Berdaya Community-Based Water Supply and Sanitation (PAMSIMAS) program, which aims to improve clean and healthy living practices in the community.

Based on the results of the study, the environmental conditions in Bira village have not supported the realization of a smart environment because the air circulation around Bira Port is disrupted due to the lack of greenery. In addition, the accumulation of garbage at Tanjung Bira also reduces Bira Village's efforts in realizing a smart environment. From the findings, the penta helix collaboration model and the role of village youth have not been maximized in Bira Village in realizing a smart environment.

### 4.4. Smart Government

Smart government is synonymous with the implementation of e-government, which is electronic-based government management by utilizing technology. For example, the creation of a village government website in order to realize village transparency, electronic-based village services, utilization of social media to provide information and public openness [21]. Based on the results of research that has been conducted, Bira

village has a website, namely <https://www.desabira.com>, the Bira village website shows a form of intelligence and transparency from the local government. In addition to the website, the government also has a social media account as a platform for disseminating information about Bira village, namely Instagram, Facebook and YouTube accounts managed by the Bira village government IT team. Based on the results of interviews with informants on August 15, 2023, that the website was originally created by the village youth, “the website was originally created by our village youth who volunteered, which was originally only for storing data like a blog but now it is developed and managed by IT” said Bira village youth, Jeri Wirawan.

The researcher also asked the informant about the form of service provided by the Bira village government to the community that was digital-based or not, and the informant said that “the services provided by the village government are in the form of a website service system, which can make letters through the website, cover letters, etc. The signature is also available digitally on the website, the service is completed in approximately 24 hours. The signature is also available digitally on the website, the service is completed in approximately 24 hours. However, it is not entirely online, there are also services that require offline “said the administrator of the Bira student student harmony organization (KPMB), Jeri Wirawan (Interview 15 August 2023). In addition, the Bukukumba Regency Government supports Bira village as a smart village, this can be seen with the launching of the SIJAWARA application (Sistem Informasi Jaga Warga Ta), this application is an android-based application, so that residents only need to press the red triangle-shaped button if they need help [20]. Based on this, Bira Village is ready to face the era of society 5.0 by using digital technology in providing services to the community.

The form of penta helix collaboration has not been found in this research, there is only triple helix collaboration between the government, the community and the media. The form of collaboration carried out is that the village government provides the budget for website development needs, to collaborate with the social service office. Then the role of Bira village youth in supporting smart government, according to the results of the study, it can be seen that village youth are very enthusiastic in helping the village government in making village websites as volunteers, and this has shown the readiness of Bira Village youth in facing the era of society 5.0.

#### 4.5. Smart Economy

Smart economy refers to several indicators including an innovative, creative economy, the ability of the community to see economic opportunities, take advantage of opportunities that exist at the local level but are globally oriented, good economic management ranging from management, marketing, and so on [21]. Based on the research results, community income in Bira village comes from several sectors, including fishermen, sailors, laborers, police, tourism, and so on. The way the villagers earn income is by utilizing Facebook social media in promoting their sales and also selling in traditional markets.

Economic activities in Bira village are also assisted by BumDes and MSMEs as suppliers, “in Bira village there are sarong craftsmen, where village youth also help in making the sarong, but until now there are still few young people who help and mostly old people” said Jeri Wirawan, Bira village youth (Interview August 15, 2023). The economy in Bira village is also supported by the existence of a tourist village, where the tourism, youth and sports office organizes digital tickets at the entrance. The tourism village is also assisted by the village government, namely holding a collaboration with PT.Telkomsel Makassar with the aim that Bira village can be better known by the public, with digitalization of the Bira village community can access at any time and increase the potential for visits to Bira village. The collaboration was marked by a joint signing between the head of Bira village Murlawa and the General Manager of PT Telkomsel Makassar Nuryadin at the Hall of the Bulukumba Regent’s office on October 28, 2022 [24]

Based on the results of the research conducted, it can be seen that there is a pentahelix collaboration, namely the village government collaborating with the Tourism, Youth and Sports Office. PT Telkomsel as a businessman who supports digitally integrated tourism villages, Social Media as an information dissemination platform, youth/community and academics who help disseminate information about Bira village to the Public. The development of smart economy, Bira village youth are quite enthusiastic in supporting the economy in Bira village, it’s just that the sarong craftsmen are still minimal youth who do it.

#### 4.6. Smart Mobility

Smart Mobility is an environmentally friendly and high-tech transportation system. Therefore, smart mobility can be defined as the use of a transportation system using high technology in the form of electronic, computer and telecommunications technology so that its use can provide convenience and efficiency, both in terms of time, cost, or energy and is environmentally friendly [25].

Based on the results of interviews on August 15, 2023, researchers asked what types of transportation are often used by the people of Bira village, “here still use private vehicles, if public transportation such as gojek, mamminasata buses do not yet exist, but there are transportation services for shipping goods, and there are also regional cars that can be ordered via WA” said Jeri Wirawan, Bira Village Youth. In addition, the Bira Crossing Port is the lifeblood of transportation between the islands of Selayar and between provinces, and plays an important role in improving the economy and regional growth. However, in its implementation there is still a lack of Port facilities such as the unavailability of bus stops that function as intermodal links between public transportation users and ferry transportation and vice versa [26].

Based on the results of the research conducted, the transportation of the Bira Village community has not used smart mobility transportation, while the inter-island transportation used by the Bira Village community has not provided optimal service to the community. The role of village youth and penta helix collaboration has also not been found in Bira Village in realizing smart mobility, so that the efforts made in facing the era of society 5.0 in the aspect of smart mobility in Bira Village have not been found by researchers.

### 5. CONCLUSION

Pentahelix collaboration, including the role of youth, has not been fully optimized in supporting smart village development in Bira Village. In the smart people aspect, there is collaboration between government, community, business people, academics and media. Youth are involved through the activities of the Panrita Lopi Bulukumba Children's Forum and the Bira Student Student Association, which support social activities and creative education. On the other hand, in the smart living aspect, government efforts through the provision of digital-based health services and health facilities are adequate. However, pentahelix collaboration has not been optimized, especially in realizing the

smart living concept. On the smart environment aspect, the main obstacle comes from the disrupted air circulation in Bira Port due to the lack of greenery as well as the problem of waste accumulation in Tanjung Bira, which hinders the implementation of smart environment. The pentahelix collaboration model and the role of youth have also not been fully utilized in this area. The smart government aspect in Bira Village has not shown a clear form of pentahelix collaboration, only a triple helix between the government, community and media. Nevertheless, the youth voluntarily participated in the creation of the village website, showing their readiness to face the era of society 5.0. In the smart economy aspect, pentahelix collaboration has started, especially between the village government, tourism office, PT Telkomsel, social media, and academics. However, youth involvement in village economic activities, such as sarong crafts, is still minimal. In the smart mobility aspect, transportation that supports smart mobility is not yet available in Bira Village, both for local and inter-island needs. Pentahelix collaboration and the role of youth in this aspect are also yet to be seen.

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