Integrating Smart City to Smart Village Initiation: Potential and Aspiration

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Abstract. The Smart City concept emerged with the Information and Communication Technology adoption and innovation. The concept can be adapted to village scope. Smart Village can be developed with various characteristic related to the local culture. This study aims to discover the potential and aspiration of Smart Village initiation in Magelang region. The study analyses the critical element of Smart City that support the Smart Village development. The study uses qualitative method with case study approach. The Smart City has provide policy, digital infrastructure and human resources that support Smart Village development. The cultural aspect has significant role for smart governance pillar. The aspiration for Smart Village design are: a) the integration and effectivity of government digital application, b) capacity building, c) the community participation into digital utilization and d) increasing community wellbeing. In conclusion, the Smart Village initiation needs to utilize the village resources based on local aspiration.

Keywords: smart city, smart village, information and communication technology, governance, rural development.

1 Background

The regional development based on Information and Communication Technology (ICT) has brought rapid changes in governance and public services. Smart City is one of the concepts as pioneers of change where the integration of information technology is implemented in various aspects of development [1,2]. Smart City emphasizes integrated development with 6 (six) pillars, namely: a) smart governance, b) smart society, c) smart economy, d) smart living, e) smart environment and f) smart branding [3,4].

Smart City has been adopted by various regional governments in Indonesia. The governments seek to utilize ICT in governance through data integration of various Regional Government Organization and synchronization of local government programs. Smart City program shows positive impact on public services [5]. However, the implementation of Smart City still faces various challenges. One of the issues that should be considered is the representation and

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participation of the village government [6]. The Smart City implemented by the regional government has a salient gap on village role into the program. The regional government has not yet optimally accommodated village development. Several barriers occur to support the village role into the Smart City planning such as infrastructure, connectivity quality, human resources and regulation.

It is argued that the potential of smart city approach to smart megacities and clusters, cities and villages [7]. The Smart Village concept emerged to fill the gap on village government participation in the use of information technology independently [8]. Smart Village is in line with the values and principles of local development in accordance to Village Regulation number 6 year 2014. Smart Village supports village development based on village authority where the village have a position as subject of development. Various Smart Village concepts have emerged to enrich the understanding of how villages can utilize information and communication technology and improve the quality of public services to the community. Smart Village departs from the use of information technology that is able to support community quality of life, effectiveness, and competitiveness of social, economic and environmental dimensions [9].

Smart village development requires a study and analysis of the norms, values and character of the village community [10]. This is important because the community is placed as the actor (user) of information and communication technology. The introduction of the benefits of information and communication technology is not without obstacles. The public needs to consciously understand the benefits and impacts of using information technology. On the other hand, the public has the power to have an opinion (voice), choose (choice) and gain access (access) in using information technology for their wellbeing [11]. Smart villages within the village framework provide space for village communities to build villages according to the needs and potential of the village.

Various constructions related to smart villages were put forward by experts, academics and practitioners in developing definitions and benchmarks for smart villages. This paper analyzes the smart village concept based on the previous studies and field findings. This paper also explores the efforts to initiate smart villages which are not only limited to village administration but also for village development and community empowerment. Furthermore, this paper aims to explore the potential for smart village implementation, aspirations for smart village implementation and important sustainability factors for smart village development.

2 Literature Review

2.1 Smart City

Smart City is a concept to create a city that is able to manage natural resources, human resources, governance, mobility, environment and life that is built intelligently [12]. Smart City or smart city is intended to encourage economic growth, improve the quality of life and participatory governance management [13]. The Smart City concept expressed by Giffinger [12] suggests 5 (five) pillars of Smart City, namely: a) smart governance, b) smart people, c) smart economy, d) smart environment. (smart environment) and e) smart mobility and f) smart living.

Smart Governance or smart government encourages improvements in governance and increases the effectiveness of public services through the use of information and communication technology. A similar concept to smart government is e-government which focuses on electronic-based administrative services. Smart governance has a broad dimension, not only limited to e-government services but also the use of data for proper development and community empowerment. Smart economy aims to improve the community's economy. By utilizing information technology, economic processes from upstream to downstream are expected to overcome the challenges of change. Smart people or smart people emphasize the importance of human resources who have the ability and skills to utilize information technology to improve the quality of life. Smart communities are a substantial component on which the various pillars of smart villages rest. Smart society is not defined only as objects that use technology but also relates to ways of thinking about using technology in a positive way.

Smart living is defined as a process of improving the quality of life related to health, education, housing and social cohesion [12, 14]. Smart environment is based on the availability of information related to the potential utilization of natural resources, energy utilization and community participation in environmental management. Smart mobility is a pillar based on the availability of infrastructure that supports mobility. Infrastructure that supports mobility can be in the form of physical infrastructure such as buildings, roads or infrastructure in the form of an internet network. Smart people emphasize community involvement in taking advantage of opportunities that exist in the village through information technology. Smart people also see the extent to which people's behavior changes to utilize technology appropriately and provide benefits in their lives.

The European Union defines a smart city as an environment where people can improve their quality of life through innovative use of information and communication technology in all aspects of life such as transportation, education, health and energy efficiency. Smart city is when investment is aimed at human capital, social, communication infrastructure can encourage sustainable economic growth, improve quality of life and appropriate natural resource management through participatory governance [15]. Smart Cities are not only related to hardware and infrastructure but also human resources. Smart Cities also ensure the participation of the community and stakeholders in the development of activities [16]. Partnerships can be built in various aspects such as technological, economic and social. The smart city management model integrates the value of innovation. The smart city sustainability encouraged from the innovative industry and Small-Medium Enterprises (SMEs), for instance the development of smart transportation and smart energy though ICT utilization [17].

2.2 Smart Village

The smart village concept cannot be separated from the smart city concept. the implementation of smart cities is built to reach cities/districts. meanwhile, regional policies will logically be applied to the government structure horizontally. The village government in the context of smart villages has not been able to play a full role because the focus of smart cities is indeed on the city/district government. The smart village concept is the adoption of development, one of which is smart city [18, 7].

The smart city concept was developed by taking into account the different development characteristics of urban areas, namely rural areas. The concept of rural area development which is in line with smart city known as smart rural and smart village has been developed by various countries as an effort to overcome the problems that exist in rural areas. Smart village developed with the typical characteristics of the village community. The smart village concept is seen as the integration of information technology in the life of rural communities [10]. The existence of the village as a community unit is important where the village development process through smart villages is part of the participation of local communities. Smart village is a rural development innovation that encourages knowledge-based development, improves the economy and improves human resources by utilizing technology [6]. The following table shows the difference between the concepts of smart city and smart village.

Table 1.1 Concept between Smart City and Smart Village

Aspect	Smart City	Smart Village
Approach	Top-Down	Bottom-Up
Government Position	Regulator	Facilitator
Development Process	Collectivity and integration on the basic elements of smart city	Strengthening, awareness and participation in smart village elements
Success Requirement	The technological approach is the main basis; every party is encouraged to use information technology as the basis for the success of a smart city	The socio-cultural approach is main basis. There is an identification of the values, characters, norms and problems that being in society is the basis of smart village

Source: (Herdiana, 2019)

The smart village concept is defined as the integration of information technology to provide positive benefits for the lives of rural communities [10]. The smart village dimension consists of resources, institutions, digital services and sustainability [19]. One of the best practices for implementing smart villages in Indonesia has been the Banyuwangi Government by developing Smart Villages through Regional Regulation number 60 year 2017. The Banyuwangi government has developed 7 (seven) criteria, namely a) public services, b) economic empowerment, c) health, education, and cultural services, d) human resource development, e) poverty eradication and f) legal information literacy with the use of information and communication technology [20]. The presence of the smart village program in Banyuwangi is able to bring closer and easier public services by using information and communication technology (ICT) tools.

2.3 ICT Utilization for Village Development

In the era of development 4.0, information technology has become one of the tools in village development. ICT has an important role in development and has increased access to markets, increasing efficiency and competitiveness of the people [21]. Social development can be achieved by utilizing the use of Information and Communication Technology (ICT) which is currently growing. With the proper use of ICT, especially access to the internet, it will be able

to become a key for economic growth, social development, as well as empowerment of the disadvantaged and will foster integration between social development and economic growth [22, 23, 24].

The use of ICT in village development has been implemented by most villages in Indonesia. However, the use of ICT in village development also has a negative impact. The use of ICT can create gaps in accessing social networks and also social capital which will lead to a larger gap in disadvantaged people [23].

3 Method

Research on smart villages emphasizes the issue of using information and communication technology at the village level in accordance with the pillars of smart villages, namely government, economic, social and environmental aspects. Research on smart villages was carried out through qualitative research with an analytical descriptive approach. The research conducted with field study from September 2021 to October 2021. Analytical descriptive approach helps researchers explore the object of research in depth. Analytical descriptive approach describes the findings through narrative [25]. The focus of the research looks at the development of smart villages related to the village development process. This research approach helps to find various relationships or relationships between actors involved in village development both structurally and culturally. The study use snowball sampling to find the key actor in the development. There are 15 informant that participate in this study. The study gathered information through Focus Group Discussion, semi-structure interview and documentation. The study starts with the interview process to village local government in Pucungrejo village, Sumber Village and Menayu village. The interview expanded informant to village community, stakeholder and private actor for instance Internet Service Provider. Focus Group Discussion held with Magelang regional government and village government. There are documentation process where the study try to find legal document that related to the ICT development in Magelang. Smart village research analyzes the facts of the implementation of smart villages that are connected with the existence of local governments, village governments and related parties including village communities. The research also examines dimensions that support the development of smart villages such as infrastructure, regulations, governance and village community participation.

4 Result and Discussion

4.1 Smart City in Magelang

Magelang Regency has implemented a smart city program starting in 2018. In its implementation, Magelang Regency already has a smart city master plan as a guideline. The vision of implementing a smart city is the realization of SEDAYA AMANAH (Prosperous, Competitive and Trustworthy). Department of Communication and Information (DISKOMINFO) is the smart city management agency. All programs related to smart cities have been included in the RPJMD (Regional Medium-Term Development Plan) so that each program has a budget allocation and is implemented by all Regional Government Unit.

Magelang Regency collaborates in smart city implementation by involving elements of academics, all Regional Government Organizations (RGO) and related stakeholders in the preparation and implementation of the Smart City Masterplan. The Magelang Regency Smart City Masterplan is a roadmap for the implementation of a smart city which consists of various RGO programs that are encouraged to support smart cities. In addition, there are contributions from regional and village forums that support activities such as JOGO TUK, Destana, Pokdarwis (Tourism Awareness Group), Tourism Village, Magelang Go Organic, Paseso (Paseduluran Seso)/Sister Village and TP PKK (Family Welfare Empowerment). Magelang Regency has supporting factors including:

Infrastructure. Magelang Region already has adequate infrastructure. First, the availability of 4G/3G networks: 5 cellular operators, 241 telecommunication towers, 391 BTS 4G/3G. Second, the availability of broadband access. There is a local government fiber optic cable of 10 km for 18 regional government unit. Third, internet and intranet networks are connected for 60 regional government unit and villages. Fourth, centralized internet access by Diskominfo with a bandwidth capacity of 2 Internet Service Providers of 350 Mbps and 320 Mbps distributed through Fiber Optic and Wireless Radio networks. Fifth, hotspots are available in every regional government unit room and 23 public locations. Sixth, the Magelang Regency Regional Government Data Center is centralized and located at Diskominfo. Seven, there are other supporting infrastructure such as command center facilities, CCTV, VOIP (Voice over IP), Video Conference and Call Center 112 Services.

Policies and Institutions. Regional Regulation Number 3 of 2019 concerning the implementation of communication and informatics, Regional Regulation Number 5 of 2019 concerning the medium-term development plan of the Magelang Regency for 2019-2024, Raperbub on governance of information and communication technology, Raperbup master plan smart city.

Human Resources. The number of local government employees is 7,783, with 85 ICT backgrounds and 525 with master's degrees and above.

The implementation of smart cities in Magelang Regency reached 92.75% of the total program activities. This can be seen from the table below.

Table 2. Smart City Implementation

Pilars	Number of Program	Implementation 2020	Percent
Smart Governance	24	24	100,00
Smart Economy	3	2	66,70
Smart Branding	8	7	87,50
Smart Society	19	18	94,74
Smart Living	7	7	100,00
Smart Environment	8	6	75,00
Total	69	64	92,75

Source: (Diskominfo, 2021)

Although Magelang has support the infrastructure for connectivity, the regional government still faces various obstacles. First, the digital infrastructure owned by the village cannot be utilized properly due to limited assistance. Some villages are even confused about what to do

with the digital infrastructure and how to implement a smart city. This issue shows the lack of socialization for village government and community. Second, the topography in the form of mountains makes the network in the village sometimes disrupted and lost. Third, not all villages in Magelang Regency have used SID. Fourth, Human Resource Capacity in the village. The Magelang Regency Government has provided training for IT managers in the village but often changes people at each training session. The training should be followed by the same person until the material is finished so that the village IT manager can comprehend the material.

4.2 Smart Village Potential

Implementation of Smart City has provided facilitation to support smart village development. Utilization of information and communication technology to support smart villages should adjusted to village potential and needs. The villages have the potential to develop a smart village. In supporting this development, there are several basic needs, namely regulation. It is crucial to encourage smart village development and provide a framework for implementing integrated and structured ICT utilization activities. There are targets and goals that can be achieved together, for instance budget allocation that supported through the regulation. The smart village potential in Magelang explores:

Sumber Village. Sumber Village has adequate digital infrastructure. The available Internet signal is 4G strength. There is an internet network at the village office and it has been transmitted to the remote location in the village. Village development partners are the Universities for ICT development and consultation. The village has a Paseso Activities (sister village) with Pucungrejo village in the context of natural disaster mitigation.

The potential of Sumber village is agriculture which is developed into live-in tourism and violin crafts. The human resources of the Sumber village are also quite adequate. Village officials have ICT capabilities. There are also youth groups who are enthusiastic about village development. Youth groups are involved in developing village promotional video content. In developing the capacity of human resources, the village does not provide special IT training, but the village apparatus takes the initiative to learn together with other villages regarding the use of digital technology and existing applications.

The applications that are actively used by the village are Village Information System (VIS) and SISKEUDES applications for village financial system. The source of VIS funding comes from the Village Budget Allocation. The village currently has a multimedia room and there are plans to develop a pavilion room as a digital space that can be used by the community. The village government has also have a self-service machine for mail services. The services is expected to be more effective in helping the community. The village wants to develop ICT towards the economy. For example, the plan to develop a vegetable marketplace with the SIDIO application.

Pucungrejo Village. Pucungrejo village has adequate digital infrastructure. The available Internet signal is 4G strength. There is an internet network at the village office and it will be broadcast to the Dusun. Internet development partners in the village are Telkom and local Internet Service Provider. The development of infrastructure using a tower to transmit internet signals. Infrastructure facilities available at the village office include a computer and a set of teleconference tools. Pucungrejo Village also procures laptops every year for the Head of

Section. The development status index of Indeks Desa Membangun of Pucungrejo village is Independent.

The potential of Pucungrejo village is agriculture and stone carving crafts. There are also youth groups who are enthusiastic about village development. Youth in the village have ICT skills. There is a Tourism Group (Kelompok Sadar Wisata) and there are village ICT cadres who start making videos for the village, tourism and home industry. Local tourism group is a local champion to do productive activities. Utilizing digital media, the Village also provides training for village officials. The village has 26 applications from the Central Government and Local Government. There is a complaint from the village about the ineffective data application because they have to input the same data repeatedly in different applications. The village government wants data integration or the implementation of Satu Data (One Data) so that the village does not need to input data many times. The applications that are actively used by the village are Siskeudes and Prodeskel related to the citizen database.

Currently the village has a community space that included art, sports, disaster mitigation room and ICT facilitation in the village. The function of this room is for public use and government teleconference. This space was built using village funds as a form of smart city implementation. Currently the village is developing the use of technology in the field of service to the community. This is done by the process of making an independent mail service machine. e-KTP is the basis data for letter purposes. In the future, the village will also plan a request several citizen letter from home. Moreover, villages have provided budget allocation to support smart village program.

Pucungrejo Village has a resilience program against natural and non-natural disasters to maintain the safety of its citizens. During the COVID-19 pandemic which was a non-natural disaster, Pucungrejo Village also participated in implementing the "Jogo Tonggo" program which is an innovation program in handling the regional-based Covid-19 pandemic in Central Java Province. In Governor's Instruction No. 1 of 2020, the Joko Tonggo task force was formed which empowers residents to the Rukun Warga area. This program prioritizes the active participation of citizens to protect each other from the transmission of Covid-19. If someone is infected with the corona virus, residents can take care of each other by providing assistance and attention and not giving a bad stigma to those who are infected. In addition to the Jogo Tonggo program, Pucung Rejo Village also implements the Sister village program for disaster. Sister Village is a program that is a form of cooperation in the context of the Merapi Volcano disaster crisis. If a disaster occurs in one village, the other village functions to assist residents in the affected village, for example in providing shelter and assisting in the evacuation process. Pucungrejo Village has a Sister Village with Sumber Village which is located right at the foot of the disaster-prone Mount Merapi. If the activity of Mount Merapi increases to a dangerous level, then Pucungrejo Village is obliged to help Sumber Village as its sister village.

Menayu Village. Menayu Village has a telecommunication network with 4G strength. There is an internet network at the village office but it has not been transmitted to the Dusun. Internet development partners in the village are Telkom and Indihome. The only infrastructure available at the village office is a computer. The development status index of Indeks Desa Membangun of Menayu village is Advanced.

The potential of Menayu village is fisheries (Kampung ulam – fishing, fish breeding). Menayu Village has proclaimed to be a Mina Wisata Village since 2013 related to fisheries. Moreover, the Menayu Village BUMDes was only formed in 2020 whose business units will be directed to the fisheries business. Menayu village human resources are also support the village development. IT training is held by the village once a month. However, community digital literacy is low linked to education background and economy background. The villages use several applications such as Siskeudes, Siks-NG, VIS and Prodeskel. Villages have a plan to provide budget allocation to encourage smart village implementation.

The village support the data integration/One Data. The applications that are actively used by the village are Siskeudes and Prodeskel related to the citizen database. The source of VIS is from the Village Fund, Telkom Assistance and APBDes. The obstacle faced by villages in implementing smart cities is that the village government is still confused on how they can participate the smart city program from the Magelang government. The facilitation of teleconference is available and can be used by village officials but the utilization is quiet low. It is because they seldom do teleconference with the regional government.

4.3 Smart Village Aspiration

The aspiration of smart village development concerns the basic aspects related to village needs. One of important vision is to develop the village to be independent in utilizing information technology. It is also encourage the development of smart villages with special characteristics and values of local culture. The aspiration of smart village development are:

Improving the efficiency and effectiveness of governance. The local government said that the development of ICT and the various applications from central government is actually burden the work process of the village data processing. Applications did not work as its purpose to help the village government because the staff should do the data input repeatedly. This is an inefficient and effective work process.

Increase community participation in utilizing ICT which has a positive impact on welfare. The challenge that is most often encountered in the village is the direct participation of the community in using information technology. Some people think that they do not have the ability to use information technology as a medium for economic business. Meanwhile, youth are generally enthusiastic to utilizing information technology. In addition, community involvement in utilizing information technology is necessary and should written into village vision. The community should have a role and experience to get the benefits of using information technology such as increased income, access to information and opportunities to develop skills.

Increase community capacity in using information and communication technology independently. The existence of information technology in the smart village concept by the community is to improve the capacity of village human resources which is not limited to government officials but also youth, women leaders and community groups in the village. The community hopes to be able to improve skills in utilizing information technology in the village. Training activities and digital literacy are examples that can be implemented as a form of intervention for the smart village program.

Support to improve the quality of life of the community. Information and communication technology has a major role in facilitating services and access to health, education and environment. The Magelang application *Jelajah Magelang*, for example, can help the public to obtain information related to the tourism potential that exists in Magelang such as heritage tourism locations. The Regional Government also provides the *Amongrasa Monograph* application for Village. It is Village Service features and the Village Information System. This feature supports village data management. The *Amongrasa Monograph* service feature builds a database in the village such as data on health facilities (e.g. Posyandu and Polindes), number of residents, information on uninhabitable houses, energy sources, homestays. The data is provided in village website and the community can access the website.

4.4 Important Factors in Maintaining the Sustainability of Smart Village Development

In addition to the smart village initiation aspirations above, the implementation of the smart village program should be sustainable. There are many examples where the village development program related to ICT deal with poor condition and challenge [27]. For example, the community did not utilize ICT facilities such as computer and internet access for income generating activities because they tend to use the facilities for entertainment reason. The weak vision drive programs without sustainable principles. The principle of sustainability is very important to encourage activities in long term condition, increase community participation, and provide impactful benefits to the community [28]. Sustainable program would bring positivity for community mindset and behavior [29]. Several example in village development such as ecovillage development, smart farming and technology based on renewable energy show the essential value of sustainability [30]. The community will have a sense of ownership to develop the program. Therefore, the sustainability aspect is needed to develop the smart village implementation. There are significant factors to encourage sustainability for smart village development:

Leadership. The leadership factor has a very important role in order to support local governance and led to community participation. Leadership from local government play significant role to manage governance for village development. The Smart Village program needs strong leadership, bottom-up commitment and awareness. Government leadership plays a role in managing the government for village development for instance public intervention and an local policy innovation [31]. Smart Village activities is one of the strategies to foster innovation based on technology for community welfare. Leadership in smart village activities is reflected in the village head, community leaders, youth leaders and stakeholder leaders who are involved in joint activities. In addition, the leadership of the local government also supports the smooth process of developing smart villages. Village heads in Pucungrejo and Sumber villages showed how the Paseso (Paseduluran Deso) program was able to provide solutions in disaster management. Leadership by the Village Head and community leaders has a big role in moving the community, innovating and creating innovative solutions in dealing with problems that exist in the village.

Commitment. Implementation of the Smart Village program requires a strong commitment from leaders, and all community members so that this program can be implemented properly and sustainably. Commitment is the ability and willingness to align personal behavior with the needs, priorities and goals of the organization [32]. Commitment makes each individual have a sense of responsibility for the program implemented so that it runs smoothly.

Budget Allocation. Implementation of the Smart Village program must be supported by an adequate budget allocation. The budget allocation has the following functions: first, the planning function is to formulate proposed activities/activities that are deemed necessary to achieve the desired results [33]. Second, the Coordination Function, namely the alignment of the work actions of village government to achieve goals. Third, the supervisory function, namely the budget is one way to carry out supervision within the company. Supervision keeps village planning on the track and encourage transparent monitoring and evaluation. Thus, supervision support evaluating work performance and prepare for corrective action if necessary.

Human Resources. Apart from the budget factor, qualified human resources are an important factor in the success of the Smart Village program. HR must be managed properly in order to achieve the goals. One of them is done by providing training related to Smart Village.

Regulatory Support. Smart village regulations (regional and village levels) are needed as a framework for implementing integrated and structured ICT utilization activities. The aim is that the implementation of the smart village program can be monitored and evaluated to achieve the expected goals.

4.5 The Pillars

The implementation of smart villages can be implemented through the use of information technology that represents the pillars of smart villages in terms of government, economy, community, environment, life and mobility. Villages can implement the smart village program by developing their villages according to their characteristics and capabilities. The sustainability value inherent within the pillar of smart village principle [34]. The sustainable aspect from pillar are: a) the social pillar appears as the way to address exclusion of technologies, b) the economic pillar develops the village potential to utilize the digital technologies and c) The environmental pillar encourages smart technology to overcome environmental challenge [35]. The other example in farming activity, innovative agricultural processes with Internet of Things enable farmers to produce quality agricultural products in an effective way [36]. Thus several aspect on how sustainability play important roles in smart village development.

Smart village initiation in Magelang Regency is at an early stage where the village government has prepared smart village development. In general, the village government implements smart government where the village government innovates in managing village data that is used for village development.

First, smart government potential. Smart governance at the village level is implemented through the development of SID (Village Information System). The village government improves data management through SID. There are also villages that use open SID in data management. IT operators or village officials who manage data view that open SID is more open to management than SID managed by third parties. Smart governance in Magelang is also supported by information systems at the local government level. Data integration is carried out by developing the local database and including village data. Local governments provide open data features and support One Data Indonesia. The local government of Magelang Regency has an information system that accommodates administrative data collection at the village level through the Amongrasa Monograph Village and Kelurahan

feature. The Amongrasa feature provides data on health infrastructure facilities (e.g. Posyandu and Polindes), village profiles, educational infrastructure and institutions at the village level.

Second, smart people. Smart People concept refers to the human resources capacity to address challenges through creative and innovative solution. The community in Sumber Village and Pucungrejo Village show that they have potential to create innovative activity. However, the potential is in basic form and needs to be developed and integrated to technology. First, the community in Sumber Village initiates youth group to support village government to provide an interesting information service using communication media. The basic potential for smart people development in Pucungrrejo Village lean on the community culture and disaster management issues.

Third, smart economy. The Smart Economy potential in Magelang based on the natural resources and village potential. There are tourism, stone craft and culinary potential. However, the village potential has not utilized the digital technology. Forth, smart environment. Smart environment innovation can be done through the use of information technology in environmental issues. Environmental issues originating from the village for example, disaster mitigation, waste management, organic farming and environmental management. Utilization of technology is carried out in disaster mitigation activities in the Paseso Merapi program. The Paseso program develop the bonding between Pucungrejo Village and Sumber Village. The village has a data-sharing innovation. During rescue activities, village refugees can exchange data regarding their displaced residents. In Paseso, each village updates data such as refugee data, village population data, number of livestock, Merapi condition information, village social and economic conditions of the community.

Fifth, Smart Mobility. The village government provides infrastructure to support the use of information technology. The village government received support for teleconference facilities from the local government of Magelang government. The availability of internet network infrastructure has not been provided by the local government, but there are several village governments that independently provide internet access for government purposes. Meanwhile, teleconferencing infrastructure functions for coordination and communication between local governments and village governments.

5 Conclusion

The Smart City program in Magelang has potential to support Smart Villages development. The Smart City program provides policies, digital infrastructure and human resources which are important factors in the implementation of smart villages. Smart village implementation can be done by utilizing village resources and based on local aspirations. Local aspirations from research results include the development of smart villages that should be done by increasing the efficiency and effectiveness of governance, increasing community participation in utilizing ICTs that have a positive impact on welfare, increasing community capacity in using information and communication technology independently and providing support in aspects of improvement. people's quality of life. In addition to these local aspirations, there are important factors in maintaining the Sustainability of Smart Village Development, namely leadership, commitment, budget, human resources and regulatory support.

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