ICT Utility to Remote Rural Communities: a Case Study in Melung Village

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Abstract. In this paper, we explore the Information and Communication Technology (ICT) utilization of remote rural communities. ICT is utilized to solve slight agricultural problems in Melung Village. To obtain the understanding of the behavior of Melung Villagers use of technology, we use the social contractual utilitarianism implementation. This insight is one of the social humanism dimensions from Bryan Ellis' perspectives. This paper primarily features qualitative techniques consist of an in-depth interview and observation. Both techniques result show that an agreement to make a community that have a better situation is the crucial aspect to build social contractual utilitarianism dimension. The triangulation process results also confirms the agreements between the community members and the leader formally and informally. We discuss the other aspect of social humanism for future research studies.

Keywords: ICT, Social Contractual Utilitarianism, Digital Communication, Social Humanism.

Introduction

Several public services, such as infrastructure, farming, education, social welfare, health care, electricity, and information system, are needed to build a smart village. Computing, Information Communication and Technology (ICT) are also required to applied to the village environment to improve their service and to have equal rights for the community to access information. Through the development of information system and accountability in fund management and villages, it is an effort to objectify a clean, authoritative, and responsible village government.

Even though this effort is disparate, fragmented, and piecemeal, ICT performs a significant role in delivering and maintaining government services [1]. ICT is considered capable of solving development difficulties in rural districts. The adoption of ICT instruments to reach and distribute information becomes essential for villagers in remote agricultural fields [2]. It helps to influence society through sustainable development and social responsibility. ICT also utilizes social media networks in the process of value co-creation [3].

Geographically separate areas with authoritative rural governments pose a challenge to consistency and coordination in every part of the country. The success of national government policies is implemented through consolidating the village and approaching uneven economic expansion, these will help define what the future holds for Indonesia [4]. Melung Village, Kedungbanteng sub-district of Banyumas Regency, Central Java Province, uses ICT in their activities and it is well known as the "Internet Village" [5]. It is the place where GDM

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(Gerakan Desa Membangun) or village developing movement firstly launched and continued focusing on the sustainability of GDM [6].

Melung Village, in which the geographical location is in the Belt of the West Side of Mount Slamet, it is a forest side village with hilly topography and an average land slope of 20% - 30% (Figure 1.). In early 2013 Melung villagers were a total of 550 household heads and 690 married couples with a population of 2,300 people consisting of 1,189 men and 1,111 women with an average of every family consisted of 3 to 4 family members.

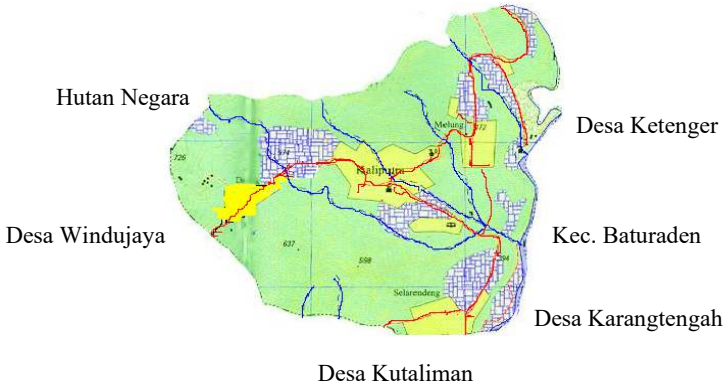

Fig. 1. Administrative Region Map of Melung Village

We primarily feature qualitative techniques to explore the Information and Communication Technology (ICT) utilization in remote rural communities. The opportunity of social humanism aspect in the digital village in Indonesia emerges since the social humanism movement proposed to liaison with the digital divide of ICT. The more profound meaning of the social contractual utilitarianism dimension brings enrichment and insight to complete the previous research about Melung Village [2], [6]. This paper deals explicitly about how the social contractual utilitarianism aspect brings insight into the use of ICT by Melung Villagers.

Analytical Framework

Social Humanism Dimensions

Ellis [7] states three fundamental principles of humanism, which include:

(a) A version of social contractual utilitarianism,

(b) Social contractual egalitarianism, and

(c) Real equality of opportunity.

The notion of social contractual utilitarianism poses that every community that is administered by approval has an authentic social contract of some kind. It demands the establishment and improvement of the state welfare. It also proposes a framework for a series of agreements between countries on global social and moral issues. The legal agreement, both formal and informal between society and the ruler, legitimate this relationship. The social contractual utilitarianism dimension has four concepts:

(a) The agreement among community members,

(b) The agreement about something good,

(c) The agreement about something needed by the community,

(d) The agreement to make the community have a better situation [7].

The prominent thing about social contract profoundly affects people's lives and has to continue to emerge if they are to be accepted. If X ought to do A and Y ought to do B to

maximize the utility among them, they must negotiate, resolve together what to do, and proceed accordingly. In general, they require cooperating, collaborating, and planning of action, to share responsibilities, monitoring, and control. They need to build a social contract to solve these problems [7].

Method

The previous research about Melung Village was conducted in quantitative and qualitative methods. An explanatory study [2] was conducted to analyze how the patterns of adoption and use of ICT by the society in remote rural areas [2]. A qualitative method and case study being used to learn the emergence of Gerakan Desa Membangun (GDM) as the villagers' collective movement in Melung Village [6]. This paper primarily applies qualitative techniques that consist of an in-depth interview and observation to obtain an understanding of the behavior of the Melung Villagers' use of technology. We use the social contractual utilitarianism implementation from three-steps of studying:

(a) Collecting the details about Melung Village from digital media. The search engine tools provide an efficient result from a lot of information [8]. The search engine also has become the technology that offers an unlimited amount of data that the web contains [9].

(b) Doing field observation to examine and identify the real situation and condition. A similar technique was conducted to observe information and communication technology in the village of Aguacatan, Guatemala [10]. Melung Village is located in Kedungbanteng District, Banyumas Regency. Kutaliman and Kalikesur Villages border the South. The state forest borders the North. Windujaya Village borders the West. Eastside borders Ketenger Village and Karang Tengah Village.

(c) Conducting an in-depth interview. Melung villagers including the policy officer are the informants. This technique refer to Taryono's study [6] that analyzes about GDM (Gerakan Desa Membangun) or village developing movement phenomenon in Melung Village, Banyumas Regency.

The four concepts of social contractual utilitarianism are being used as interview guidance for the informants. The social contractual utilitarianism aspect is broken-down into details [7] for the interview questions:

(a) The benefits of digital technology use
(b) The ability of digital technology to help life
(c) The right to use digital technology
(d) The obligation to pay to use digital technology
(e) Responsibility for digital technology
(f) Conformance with personal values
(g) Obedience to surrounding values
(h) Understanding legal bases regarding the use of digital technology
(i) The habit of using digital technology
(j) Welfare by using digital technology
(k) There are conflicts with other parties because of the use of digital technology
(l) Harmonious society that is created thanks to digital technology

The other answers or discussions that are not related to the ideas are treated as the enrichment and significant contribution to the research.

Three types of coding: open, axial, and selective coding [11] were conducted to analyze the results of observation and in-depth interview to the informants. The selective coding explained into thematic analysis to emphasize the repetitive patterns that emerge in qualitative

data [12]. The patterns across datasets are essential to describe the phenomenon to answer the research question.

To validate the qualitative data, we use source triangulation that comes from community members (policy officer) to do some crosscheck and optimize the prominent results from the finding [13].

Results and Discussion

The observation begins with collecting, researching, and examining administrative documents about ICT in Melung. The materials examined were (1) RPJM and RKP of Melung Village, (2) Melung Village profile from Pemerintah Kabupaten Banyumas (Banyumas Regency Government), (3) Melung Village official website (melung.desa.id). The following are the results of observed documents (Table 1).

The biggest remaining problem of ICT penetration in Melung Village is the government awareness. When some serving village officials prioritize ICT as one of the potentials to advance the village, Melung community awareness to utilize these facilities continues to be maintained at best. When these facilities come down from the top priority, government awareness to keep supporting, utilizing and developing the village potential decline. Unfortunately, Melung Village is one of the pioneers of GDM and hosted the first holding of the Village ICT Festival (DesTIKa), the village became the object of comparative studies related to the use of ICT of villages from various regions in Indonesia that were struggling.

The next problem that emerges is the quality of ICT. The equipment being used to access ICT has begun to perform less well. Data from observations indicate that the number of hotspots that are still active decreases, from a total of 8 hotspots to 5 (Figure 2.). Topographic conditions and natural constraints also cause all WiFi signals to die. It usually occurs when the antenna is struck by lightning. Therefore, since the WiFi router antenna would be damaged due to heavy rain accompanied by thunder and lightning, the antenna would be turned off [14].

Signals with a bandwith of 512 Mbps cannot reach all areas in the village properly, it's only available in certain places such as village halls and the house of Mr. Budi (former officials of the village apparatus who pioneered the installation of WiFi routers).

Table 1. The Observation Results

The physical condition of the village area (location of the hotspot)	(1) Location of WiFi hotspot: Initially, there were 8 hotspot. However, three wireless routers were damaged so that there are 5 active WiFi routers. Five WiFi areas are located in the village hall, the house of Mr. Budi (former village head), and at the role of the housing village. (2) Tools used for internet access: mobile phones, public computers, and laptops (3) Cost per month for hotspots: • from the cable (Pak Budi's house) Rp. 340,000 • for villagers who use Speedy (telkom) Rp. 200,000

	(4) 512 Mbps internet speed (5) Busy places being used to access internet: • village meeting hall • around the house of a former village head (Mr. Budi) (6) The fastest internet access locations: • village meeting hall • around the house of a former village head (Mr. Budi) (7) Location where internet is unavailable: place of worship
The observation results of media access of Melung villagers	1) Medias being accessed by the community: televisions, radios, cellphones, laptops (2) Medias being used to disseminate information: official website of the village (melung.desa.id), social media, blogs. (3) Available informations in the official website: village potentials, village news, village history, population data, as well as comment column for the community to express criticism and suggestion, which mostly come from residents of Melung who are outside the city.

Regarding media access, generally the tools being used by Melung villagers are television, radio, cellphones, and laptops. Some computers are in the village hall, but their access is limited. The most significant use of media access is to disseminate information, especially on the Melung village government website, melung.desa.id.

The third problem that arises is the lack of adequate knowledge from the community member to take advantage of available media access. Although some can make good use of it and even benefit from it, the dissemination of this information is uneven. Even though they should have the same opportunity, data from observations showed the education attainment for the majority of Melung villagers are junior high school. Their professions are mostly farmers and day laborers, while in the third place are residents who have not / do not work.

Fig. 2. Melung Village Hostpot Conditions

Based on the characteristics of Melung Villagers (Table 2), eight informants were chosen as the representation. The village head, Mr Budi as a former official of the village government, three other village apparatus, one trader, one young age villager, and a student.

The good news is that young people in Melung Village are more aware of the use of ICTs and their media access, although it is still in the stage of seeking entertainment and information. Further utilization should be done considering that Melung Village has the potential of agrotourism and ecotourism because of its location that is close to Baturaden. Melung Village natural resources can also be used as economic value by the presence of the Ketenger Hydroelectric Power Plant (PLTA), which has the potential to become a technical and educational tourism spot.

Even though there's a lack of adequate knowledge and some limitations in Melung villagers regarding the utilization of ICT, Melung Village has represented how the agreement concept of the social contractual utilitarianism dimension that's prominent is an agreement to make a community have a better situation. The village authority and the community members agree to maintain the facilities and proposed the maintenance of their facilities to the government. Bottom-up agreements between community members and the village officials about the ideas of development bring the impact on longer-term circumstances and support the environment. Melung villagers' willingness to improve themselves should be supported by the government too.

Table 2. The Characteristics of Melung Villagers

Characteristics	Number	Percentage (total 2300 persons)
Gender:		
Male	1189	52
Female	1111	48
Age:		
< 20 years old	843	37
20-29 years old	348	15
30-39 years old	357	16

40-49 years old	275	12
50+ years old	443	20
Occupation:		
Farmers	271	12
Ranchers	12	1
State Employees	14	1
Traders	28	1
Others	1424	62
Unemployed	531	23
Education:		
Undergraduate	16	1
Diploma	6	0
High School	103	4
Secondary School	361	16
Elementary	977	43
Elementary	623	27
(unfinished)	196	9
No Education		

Conclusions

We overview how the agreement as part of the social contractual utilitarianism dimension are essential to drive the development of Melung villagers behavior in using ICT. The agreement concept also opens the opportunity to develop the potential of Melung Village.

The agreement is not the only finding from this study. The prominent process from the Melung Villagers coordination process is an intermediary. The implementation of social contractual utilitarianism can co-exist with the personal characteristics that could play a role as an intermediary agent.

The future study can elaborate on other concepts of social contractual utilitarianism. Further research also can extract relevant construct for digital village analysis.

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