Voices from the last mile: The place of emotions in the social impact analysis of access to communication

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Abstract

While cellular technology has become ubiquitous and effective in bridging the digital divide, billions of households around the world remain unconnected and unserved. Increasing income and effective participation in governance are the gold standard in establishing the positive social impact of innovations that seek to provide access to communication in last mile areas, which are usually geographically isolated rural villages. Results from the social impact analysis of the Village Base Station Project (VBTS), using culturally-sensitive oral history, reveal that end-users use emotional terms, such as *ginhawa* and *perhuwisyo* in assessing how access to cellular networks affected their everyday life and social relationships. This article contributes to the scholarly discussions on the social impact of cellular technology by understanding end-users' emotional responses as indicators of social impact. We argue that a more human-centered framework for social impact assessment requires a careful consideration of emotional evaluative statements from silenced communities, or of voices from the last mile.

Keywords: social impact analysis, cellular technology, communications, emotions

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Statement of the Problem and Objectives of the Paper

Cellular communication technologies bring immense changes in infrastructural and physical capabilities of communities, as well as in personal and community decision-making processes (Campbell & Kwak, 2010; Mwantimwa, 2019; Sinha, 2005; Urquhart et al., 2008). Thus, several studies examine how mobile phones are used to generate social capital especially in poor rural villages. Findings suggest that aside from enabling individuals to connect with one another, mobile phones can also help create economic opportunities, strengthen social networks, and organize political mobilizations (Campbell & Kwak, 2010; Mwantimwa, 2019; Sinha, 2005; Urquhart et al., 2008). Mobile phones help generate rural livelihoods and contribute to poverty reduction (Sife et al., 2010). They enable end-users to expand their business contacts and to increase their income by saving money from reduced travel costs (Donner, 2006). The economic and developmental promises of mobile technology remain to be the dominant ways of analyzing its social impact. Expressions of an improved sense of wellbeing and feelings of relief in the context of social relationships are usually less valued as evidence of social impact (Arora & Rangaswamy, 2013).

The discussion in this paper aims to push this conversation forward by showing that feelings are indicative of social impact and should have profound repercussions in the realm of technology development, business modelling, and public policymaking. Data from our qualitative social impact analysis, which is informed by the principles of a culturally-sensitive oral history, show that end-users of the Village Base Station Project (VBTS) described the most important changes in their lives after having access to cellular communication by using emotional terms such as *ginhawa* (relief) and *perhuwisyo* (dismay). We interpret these affect-based responses as evaluative statements on the impact of the project that reveal important insight about access to communication in last mile villages. Often dismissed as less persuasive anecdotal evidence in justifying sustained investment in last mile villages, these emotional accounts should be given emphasis in a human-centered assessment of impact to amplify the voices from the last mile.

Background of the VBTS Project

The digital divide created new hierarchies between those who have access to information technology and those who do not (Arquilla & Ronfeldt, 2001; Castells, 1996; Entman, 1996; Harris, 2016; Mansell, 2012; Skuse & Cousins, 2007; Tikao, 2013; Ullah, 2017). The Village Base Station Project (VBTS) is an interdisciplinary research project that aims to contribute to close such

a gap. Initiated by UP Diliman and funded from March 2015 to September 2019 by the Philippines' Commission on Higher Education (CHED) through its Philippine-California Advanced Research Institutes (PCARI) program, it aimed to empower marginalized villages by deploying a community cellular network system (CCN) in sites that have no access to cellular phone services. It is a contribution to a global effort towards the development of human-centered technologies, which is an emerging approach in innovation that is championed by engineers and computer scientists who uphold the ideal that science and technology should be democratized.

The VBTS project team is an interdisciplinary team of researchers from the University of California Berkeley (UC Berkeley) and from the University of the Philippines Diliman (UP Diliman). The engineering team developed and deployed the base stations and built the towers while the social science team investigated the social impact of this technological intervention and the policy environment affecting the development and deployment of such technologies. Even if each team was doing research and development in their specific field of expertise, the entire team collaborated in every significant aspect of project implementation through regular teleconferences and joint visits.

The VBTS technology package is an easy-to-maintain, low-cost and low-power technology managed by host villages. It includes the installation of base transceiver stations (BTS, or base stations) that can provide cellular signal within a 500-meter radius in selected sites. It also included the conducting of a series of trainings for designated village operators, faculty members from the provincial college, and engineering personnel in the local government unit to help build local capabilities in the maintenance and repair of the VBTS.

Implementing the VBTS project required the collaboration of several stakeholders. A telecommunications company (telco) allowed the use of their frequency as part of their corporate social responsibility program, through a Memorandum of Agreement with UP. The Philippine office of an international non-government organization working on innovation and poverty reduction provided free sim cards to end-users in the selected project sites. Partner municipal governments secured access to lands in the selected villages where the towers were constructed. Existing village cooperatives became project partners who handled the business component of the project. They bought the prepaid load in bulk and at a discounted rate from the telco and then sold these in retail to end-users in the village.

Profiles of the Project Sites

Marginalized villages, or villages that remain outside the telecommunication grid because they do not meet the viability criteria of big telecommunication companies (telcos), were the target sites of the VBTS project. After profiling several provinces, the VBTS project sites were eventually located in seven (7) coastal barangays (villages) in three (3) municipalities in the province of Aurora in the island of Luzon. Situated between the Sierra Madre mountain range and the Pacific Ocean, these villages are geographically isolated. According to our participants, this leaves them without access to cellular services and very poor access, if any, to other forms of basic social services, such as schools and hospitals. Children need to live in the provincial capital since the schools in the villages can only offer basic education. Students must get out of the village to pursue secondary education and collegiate degrees.

According to our participants, agriculture is the major livelihood in their villages. Their main agricultural product is coconut. Villagers also plant banana and other produce in the more mountainous terrains of their village. They sell these products in the provincial capital, Baler, and in other neighboring municipalities. There are a few small grocery stores in each village where daily household needs may be bought. Some members of the community are migrant workers and establish temporary residence in Baler.

Residents even mentioned that they travel great distances, which typically takes several hours of travel in the open sea of the Pacific, just to communicate with their family and friends who are either living or working outside the village, or to conduct simple business transactions like buying or selling. Parents whose children are studying in the provincial capital would need to travel by boat for three (3) to four (4) hours or walk for eight (8) hours just to reach the capital and talk to their children. Sometimes, they would ask commercial boat drivers to deliver handwritten letters to their family members residing in the capital.

Many residents own cellular phones even if there are no cellular services in their village, which they use for entertainment when inside the village and for communication in the few identified locations outside the village where they could access cellular signal. Through a partnership agreement with a major telco, and with the appropriate local government units, as well as with villagers' free prior and informed consent, VBTS towers were set up in these villages that made cell phone signal accessible in their residence and place of work for approximately a year, or within the duration of project implementation in the site.

Theoretical Framework

Sociologists have studied the emotional element of social events and have established that emotions are crucial elements of social order (Bericat, 2016; Kemper, 2011; Olson et al., 2017). Thus, any account of social events would have to include an analysis of the emotional experiences embedded in them (Bericat, 2016). Emotions possess three elements: evaluation, motivation, and transformation (Brody, 1999; Lawler & Thye, 1999). First, emotions are "evaluative states" (Lawler & Thye, 1999; Scherer, 2005). Internal and external stimuli are judged as objects that make one feel good, bad, or neutral. On the basis of such feelings, agents are motivated to act in view of sustaining positive valence and avoid negative ones (Brody, 1999). These evaluations and motivations transform people's understanding of social reality (Denzin, 1994).

As forms of evaluation, emotions motivate the transformation of understanding and actions. People need to feel affective affinity with each other to associate in some organized form of association. People must evaluate social rules and regulations as beneficial to their aspirations and feel good about them to be motivated to participate in social life. Thus, social order relies on the emotional responses of a collective of individuals.

Sociologists view emotions as crucial in making social interactions and social structures possible (Turner & Stets, 2005). The emotional element of social order lies within the "psychological social contract" (Moghaddam, 2008, p 887) which emerges when individuals cognitively and emotionally accept their place within the collective order. Emotional beliefs are ideas that are accepted on the basis of affective evaluation (Mercer, 2010). They not only motivate adherence to norms, they also function as templates exempting actors from trying all possible courses of actions (Srbljinovic & Bozic, 2014, 2017).

The predictability of social actions influences the intensification of social relationships and coincides with the conversion of these relationships into more usable social capital. For Robert D. Putnam (2000), social capital refers to the relationships between individuals and the norms that govern such relationships. He asserted that the virtues of a community remain useless if they are not embedded into strong social ties. In a slightly different note, James Coleman (1988) understood social capital as obligations and expectations governed by social norms that individuals use as means to achieve their personal goals. By doing so, he understood rational action as rooted in personal interests materialized through social relations. Regardless of the debate about how to approach social capital, it is clear that it presupposes that "relationships with others provide embedded resources that can be accessed, mobilized, and utilized for actions that lead

to economic and non-economic gains" (Chan, 2015, p. 5).

In this paper, we listen to the voices from isolated villages by distilling the evaluative elements in their affective statements in describing the impact of technological innovation. To conceptualize these reflections, we combine the concepts of "emotional beliefs" (Mercer, 2010, p. 2) and social capital (Chan, 2015; Kwon et al., 2013). The underlying assertion is that end-users express the impact of mobile connectivity in emotional terms to explain deeply held beliefs and cherished values. We assert that a human-centered technology compels us to account for these usually neglected vantage points on how end-users emotionally sense or feel the impact of technology on their everyday lives.

Methodology

The epistemology and ethics informing this social impact assessment is oral history. As a methodological approach, oral history gathers marginalized voices in the process of knowledge production (Batty, 2009; Bryman, 2004; Janesick, 2007; Thomson, 2007). This approach allows narrators to share stories important to them. In doing so, it elicits participants' reflections (Batty, 2009; Madison, 2005) that could reveal their evaluation of social events. Oral history amplifies muted voices from the margins of society (Batty, 2009; Bryman, 2004; Janesick, 2007; Thomson, 2007). It enables their inclusion into archival records, research publications, and popular discussions. By making these voices heard, this research approach opens conversations about these forgotten communities toward their more meaningful inclusion in national life. It could facilitate their empowerment and transformation.

This epistemological position fits well into the social impact analysis of the VBTS project which seeks to address an existing inequality in access to communication in last mile communities. The objective of this social impact assessment is to identify the various changes in the lives of end-users in three (3) partner communities from their perspective. We listened to narratives and probed categories by asking broad, open-ended questions, such as "What are changes have you experienced since the operation of the VBTS project in your village?"

In March 2019, or more than a year after the first three (out of seven) project sites had access to cellular services through the VBTS project, we conducted focus group discussions (FGDs) and interviews in these sites. To ensure that a diversified set of voices was collected, as required by the method of oral history, the researchers sought narratives from women, household heads, and young people. A total of seven (7) FGDs and seven (7) in-depth interviews were conducted. Three (3) FGDs and three (3) in-

depth interviews were with women, two (2) FGDs and two (2) in-depth interviews were with household heads, and two (2) FGDs and two (2) in-depth interviews were with young people. Each FGD had five (5) to seven (7) participants. Participants in the FGDs and respondents in the in-depth interviews were encouraged to share their narratives about the impact of having access to cellular communication in their village by asking open-ended questions. Villagers in one of the sites were less cooperative and they refused to participate in any of the FGDs or interviews.

With the permission of all participants, discussions and interviews were digitally recorded. The recordings were transcribed to facilitate coding. Using the software Atlas.ti, the team coded the transcripts guided by thematic analysis. Instead of proceeding from a specific conceptual framework, the themes emerging from the discussions and interviews were used to categorize the affective statements from the transcripts.

Discussion of Findings

Ginhawa as Social Impact

When asked to describe the most important changes that happened in their life, as a result of gaining access to cellular signal in their village, end-users in two of the VBTS project sites repeatedly used the word *ginhawa.* Jimmy (personal communication, April 3, 2019) a household head, observed that "Many [villagers] have experienced ginhawa because of the [access to cellular] signal".

In the literature from the Philippines, ginhawa refers to an experience of feeling light after an aspiration is achieved. It is a feeling of comfort and a sense of freedom. It is often expressed as a sigh of relief and described as ease in breathing. Linguistic investigations establish that the concept of ginhawa is present in several ethnolinguistic groups in the country (Paz, 2008).

Ginhawa is the Filipino sense of wellness. It is the enjoyment of security, whether economic or psycho-emotional, primarily in the context of family (Samaco-Zamora & Galang-Fernandez, 2016). While ginhawa or wellness may be measured by material things, in Filipino culture, ginhawa is achieved in the context of social interaction (Paz, 2008; Samaco-Zamora & Galang-Fernandez, 2016).

Ginhawa, interpreted as relief, is a positive emotional response to the alleviation of negative stimuli (Franklin et al., 2013). To gain a better understanding of the negative stimuli in remote rural villages and how these are relieved by access to cellular communication, we probed the narratives of our respondents by focusing on how they elaborate on their feelings of relief.

Relief from Anxiety

From the FGD with household heads that was attended mostly by fathers, ginhawa is discussed in the context of relief from anxiety that stems from the lack of information about the wellbeing of family members. Jimmy (personal communication, April 3, 2019) remembers:

> I used to worry… because even if we want to contact our children who are studying [in Baler]…, we cannot do it. Now that there is [cellular] signal [in our village], we can. But before, we really had a hard time because we had to go to Baler just to know their situation

Contact with family members, especially with those who are in distant places, is important for mutual emotional support. A young participant (personal communication, April 2, 2019) says that:

> It is important for me to contact family members who live elsewhere to know if they are okay, [to know] what is happening in their lives [or] if something bad has happened [to them]. Information about their lives is [now] more accessible.

The intensity of this anxiety is so severe that it even motivates risky behavior. Bongbong (personal communication, April 3, 2019), a father, shared that before VBTS, he had to walk for miles even under severe weather conditions just to be able to talk to his children who are studying in the provincial capital, Baler. Clearly, for Filipinos, physical distance among family members should not lead to emotional distance. They now feel relieved that their relatives are just a text message or a phone call away through the VBTS network.

However, access to information about family members does not automatically bring relief because anxiety may also come from embarrassment resulting from false information. Another father (personal communication, April 2, 2019) talked about his embarrassment when he made the costly and time-consuming trip to the capital so that he may pay his last respects to his uncle who he heard had passed away, only to find out that he was still alive. He says that it would have been easier to confirm the veracity of the news if he was able to communicate with other relatives. Relief is brought about not by information alone but by interactive communication that enables the verification of information.

This feeling of comfort, in the context of personal relationships, extends to bonding with friends among the youth in the village. For example, social gathering among friends became easier to organize, which enabled

them to strengthen friendships. A young female participant (personal communication, April 2, 2019). recalls:

> Before, we need to fetch our friends from their respective homes. Now, we can just send a text message to say, "Let's meet and hangout".

The convenience offered by the community cellular network motivates the young to meet with friends and to connect with old and new friends outside of their village. Building friendships is deemed desirable because of the emotional leisure it brings. In social gatherings, friends could share stories, laugh, and unwind. Friendship networks are also useful in fostering cooperation to achieve valued goals like education. For example, a female participant (personal communication, April 2, 2019) in second site shared her observation:

> Recently, we needed to do something for school, one of our classmates sent us a text message saying, "Come here. We have something to do." So, we went right away to do the task.

Ginhawa as relief from anxiety is an impact of the community cellular network of VBTS. This feeling is in the context of improved communication and connection with family and friends. Mothers and fathers are relieved that the communication technology of VBTS transcends the grief-inducing limitation of their geographical isolation and enables them to still fulfill their parental roles even through a distance. Young participants are delighted to be with their friends in the village more conveniently and to be in contact with friends in distant places. The VBTS project provided opportunities to strengthen personal relationships and to fulfill social expectations which are in accordance with their emotional beliefs.

Sense of Wellness in Making Informed Decisions

Life in remote rural villages are typically uncertain. They lack access to timely and appropriate information about their environment. Information, if ever they come, do not reach them in time to make a difference in their safety and wellbeing. Uncertainty, defined as the lack of knowledge or information (van Asselt, 2000), denies them the ability to make timely, informed, and appropriate decisions.

Residents in two of the three villages narrate that access to accurate information enabled them to make informed decisions that lessened the risk of harm or suffering for them. As May Flor (personal communication, April 3, 2019), a mother, observed:

> We are able to know from family members [outside the village] about coming typhoons. For example, they will send text messages saying, "Take care" or "Prepare properly for the typhoon" or "You need to evacuate.

Better access to accurate information also led to the mobilization of resources for the benefit of loved ones who are outside the village. For instance, a father shared how VBTS helped him and his other family members to care for his son who met an accident. He (personal communication, April 2, 2019) recalled:

> If not for the cellphone, I would not have known that my son met an accident. His friends called us. That is why it is a big help… When they called, we were able to travel right away to take care of him at the hospital.

Making informed decisions meant optimizing their very meager resources. Prior to the VBTS project, parents had to spend time travelling or waiting for letters to know the needs of their children who are studying in the capital. By the time they learned about their children's needs, they would lack time to address them. Now that they could contact their children through mobile phones, they have enough time to find the means to address these needs. They have more leeway in managing the family's resources.

Small business owners are dismayed that they cannot keep abreast about product prices and trends because valuable information such as these are very limited in their villages. They feel left behind which tend to dampen their entrepreneurial spirit. Jessalyn (personal communication, April 2, 2019), a young female entrepreneur, relates:

> If you are engaged in business, it is really important to have access to cellular signal [communication] to get information. You need to know changes in the prices of products. You can monitor. You can call friends. You will know. You avoid losing earnings.

With the arrival of mobile communication, small business owners could mobilize personal ties with friends and family living elsewhere to access information about products. This translated to more rational decisions in terms of what to sell and how much to sell it. These social ties that are strengthened by the VBTS community cellular network become a potential resource that could be marshalled towards economic gain. Thus, while the evaluative statements are in affective terms, such as dismay or wellness, the narratives show participants' deliberative thinking. That is, decisions are

made through careful evaluation of the consequences of actions given more information (Loewenstein et al., 2015).

Feeling of Ease in Being More Productive

Residents in these coastal villages are reliant on the provincial capital of Baler for their business transactions. Small retailers in the villages, for example, procure their merchandise from suppliers in Baler. The frequency and duration of their trips to and from Baler are dependent on the schedule and availability of boat rides, which entail two to three hours of travel in the open seas of the Pacific in small passenger boats. This makes economic transactions that are conducted outside the village a stress-inducing exercise, which requires a lot of time and money.

Small business operators in the villages observed a more efficient use of their limited time and money when procuring supplies. Instead of carelessly rushing through or spending a lot of time in procuring their supplies upon arrival in Baler, the cellular network enabled them to get in touch with suppliers to place their orders in advance while still in their village. Their orders will then be ready for pick-up when they arrive at the capital. As Hanna (personal communication, April 2, 2019) recalled:

> Of course, it is a big relief for us because before you cannot leave Baler right away. But now you can tell your suppliers in advance everything that you need. When we arrive [in Baler], our orders are already prepared…we just need to pick them up and we can go home right away.

Small producers in the village, such as fisherfolk, farmers, and artisans are also able to save time and money when selling their produce in the capital. As a fisherfolk (personal communication, April 3, 2019) shared:

> Before we go to the capital…we will send a text message to our buyers to tell them what kind of fish we have and to inform them that we will be arriving at the port at a particular time so they could meet us there. … We no longer have to wait for buyers.

A farmer (personal communication, April 3, 2019) appreciates the mobile signal because it allows him to contact potential buyers, thus, saving him travel costs:

> …Before, we incur additional expense because we need to commute from the port to the urban center. Now, we

> can contact buyers before we leave [our village]. When we arrive, buyers are already there at the port.

Leonardo (personal communication, April 3, 2019), a furniture maker, values the mobile communication between him and his clients because it improved his relationship with clients:

> My clients could order through phone…. I can tell them when I will deliver or when I am unable to do so…

Being able to get in touch with suppliers or buyers in Baler through mobile phones made business transactions easier and faster resulting to small savings in time and money. The time they gained is spent not for resting or slacking but for more productive pursuits. One fisherman said, "Before, we spend one day in the market. Now, we can go back right away to fishing" (personal communication, April 3, 2019).

The community cellular network of VBTS improved end-users' access to the market, which enabled them to save time and money that they use as modest "re-investment" in their productive activity. Their ability to become more productive gave them a sense of ease. This dispels common notions about marginalized sectors as being lazy and unproductive, and challenges mainstream poverty alleviation strategies that favor dole outs or trickle-down effects. Investment in the lives of the marginalized, even if precarious, could deliver immediate positive impact that could change lives.

Sense of Security in Having Access to Government Services

Ginhawa is also experienced in being able to ask for assistance from government, especially during medical emergencies. Government officials and services became more accessible to residents and the assistance they needed were dispatched more swiftly. A father (personal communication, April 2, 2019) recalls:

> The other night, we brought a child to the hospital in Baler. Before we left [our village], we called for the rescue team… who was already waiting at the port when we arrived…

In another instance, the assistance was in the form of mobilizing village resources to aid a villager who is in need. As one village councilor (personal communication, April 3, 2019) recounts:

> … one member of the village needed money for his sick son. He called us through mobile phone to ask for help from the council. We called people who can lend him money. Then we were able to help him.

Access to government services becomes especially crucial during the typhoon season because Aurora province lies along the typhoon belt. With the aid of cellular communication, end-users now receive early warnings from the Municipal Disaster Risk Reduction and Management Council (MDRRMC). A father (personal communication, April 3, 2019) concludes:

> That means we can put our fishing boats somewhere safe. It's not like before when nobody knows how strong the typhoon will be. Now, we are able to prepare the night before. We put our boats somewhere safe. We pack our important things somewhere safe.

With the activation of the VBTS network, residents are able to reduce the risk of damage to themselves and to the village as a whole. As a participant (personal communication, April 2, 2019) in the second site recounts:

> When there is an announcement of a coming typhoon, we will receive a message through our phones. We will know how strong and where it will hit. We are able to prepare evacuation centers. We can help our fellow villagers.

The provision of timely and accurate information about typhoons enable disaster risk reduction, preparedness, and response at the village level. Residents, together with village officials, could prepare evacuation centers and relief goods. The interaction between village officials and municipal agencies are also made easier and faster during post-disaster operations. As the village coordinator (personal communication, April 3, 2019) narrated:

> For me, who is a barangay coordinator, it's so hard without communication. The only thing we have is a radio in the barangay office. If power is out, we cannot use it. I will walk for hours just to report the damages caused by the typhoon.

Without proper access to mobile connectivity, barangay officials find it hard to report losses and damages to the municipal government. They need to wait until it is safe to travel by land or by sea to report how much relief assistance is needed in the coastal villages. This caused delays in the delivery of government assistance. With access to mobile communication, locals can communicate in real-time with municipal officials about damages in their village, which enabled prompt response from government.

Mobile networks provided end-users with more dependable ways of communicating with their government especially when they need services and information in moments of emergency. For residents in these last mile

villages, the improved response time could spell the difference between life and death. End-users' sense of *ginhawa* or relief could also be understood as a sense of security in experiencing government's presence in their life especially in moments when they are most vulnerable.

Longing for Non-Verbal Cues in Communication

Despite the positive affective evaluation of mobile connectivity in two of the three villages, residents also expressed yearning to access internet services. Many of them, while appreciative of cellular signal, understood that the internet as a communication tool will deliver more emotional relief. It is viewed as a channel through which communication could go beyond voice calls and text messages. They long for more non-verbal cues that enriches the experience of communicating with another person. A mother (personal communication, April 3, 2019) said, "If there is Internet, I can see the real feelings of my child as we talk".

For this mother, voice call or text messages do not allow you to see the other person's facial reactions, hence, interactions are still vulnerable to pretense. On the other hand, video calls allow communicators to observe not only each other's speech but also non-verbal cues, which makes emotional communication more legible. This aspiration for more authentic communication indicates that emotional evaluations do not deter the ideation of something better. End-users understand that access is not a sufficient definition of better communication. Access to communication must also enhance authenticity, promote productivity, and reduce exposure to harm.

While information flow is hastened by mobile connectivity in these areas, the internet is still cherished as a wealthier source of knowledge. Direct access to knowledge is seen as a potential tool to upgrade and develop skills valuable to increase productivity. For a farmer (personal communication, April 3, 2019):

> It would be better if people here could learn to use the Internet. They could improve their talents. For example, they could access information about agriculture. They could apply it.

A furniture maker (personal communication, April 3, 2019) expressed:

> We want to improve communication by having Internet. For example, if there is Internet, I do not need to travel to know the trend. I can get designs on-line for my products. I can post a picture of the furniture I make. Clients will see what design they want.

The Internet, then, is seen as a channel to reduce uncertainty and to increase precision in production and business transactions. Despite this appreciation of internet communications technology, some also expressed their worries about the Internet. As a young person (personal communication, April 2, 2019) in second site said:

> Students might just use Internet instead of studying. For example, COC [Clash of Clans]. They could be addicted with Dota. They will choose to play rather than review their lessons. Then inside the classroom, they could browse Facebook or play Mobile Legends instead of listening to the teacher.

Residents understood the addictive potential of games and social media applications accessed through the Internet. While the literature (Harris, 2016; Ilbery et al., 1995; Mansell, 2012; Sinha, 2005) shows that digital backwardness explains the urban-periphery divide, the balanced appreciation of the Internet in these villages shows substantial knowledge of the technology.

Perhuwisyo as Negative Evaluative Statement

In Project Site 3, residents generally refused to participate in the qualitative social impact research for the VBTS project.

The research team was able to engage in informal conversations with a few residents who expressed dismay about the project. Their dismay stems from the inability of the project to provide stable access to cellular signal. As one woman (personal communication, April 1, 2019) in the village heatedly claimed:

> The signal did not help our community. Instead of being able to use your phone while lying in your bed as they promised, I have to try hard to find signal to the point I need to place my phone on the roof but still no signal. We need to go to the coast to get signal. They said it would be good. It's not true. Before it was easy to get signal here.

Irate villagers talked about their perception that the VBTS tower disabled their access to already existing cellular signals in their village. According to some of them, residents in the village resort to amplifying the weak cellular signal of the telcos by using (illegal) 'booster antennas,' which they bought from peddlers who come to their village. One resident (personal communication, April 1, 2019) shared:

> … signals from other networks are not working anymore. That is why others use boosters to get better signal. We can no longer access signal from other telcos. Our cell phone can only get the VBTS signal. It really ruined our access to signal.

They used the term "perhuwisyo" to describe the VBTS project. The term perhuwisyo is borrowed from the Spanish word "perjuicio," which roughly translates into English as nuisance. Perhuwisyo triggers negative emotions as it disturbs or prevents feelings of ginhawa. Clearly, the use of the word perhuwisyo in describing the VBTS project is equivalent to a negative emotional evaluation of the project not because they did not want access to cellular communication but because the project did not deliver the expected better access and, in their perception, actually hampered already existing access.

Conclusion

Emotions as Evaluative Statements of Impact

Understanding emotions as evaluative statements is useful in analyzing social impact. Participants use emotions to express their evaluative statements about the impact of the VBTS into their lives. Positive emotional responses to the VBTS were based on its dependability compared to previous communication practices. Social acceptability of the project was high and encouraging in these villages. In contrast, negative feelings were triggered because, in the experience of end-users, VBTS hampered their ability to engage in remote social interaction. The negative affective evaluation of their experiences with the community cellular network contributed to their disinterest in adopting the technology. What is common in both affective evaluations however is that they are both focused only on the service delivery component of the project. The emotional responses are mainly in the context of individual needs and gains. While simple forms of resource mobilization are already discernible in their narratives, these are still confined to the private pursuit of self-interest. In their narratives, end-users did not express their evaluation of the VBTS as a community network or as a shared resource that is managed and maintained by the village. One may conclude that social capital as articulated in these narratives are akin to Coleman's (1988) definition rather than to Putnam's (2000).

Wellness as Social Impact

In two of the three villages included in this social impact assessment, the word ginhawa or the feeling of wellness captures end-users' positive

emotional evaluation of the VBTS project as a community cellular network that gave them access to cellular communication services. Wellness is articulated as the most important impact of the VBTS project in their lives and in their village. This feeling was elaborated in their narratives as a sense of relief from anxiety caused by spatial distance between family members that is a consequence of the geographical isolation of their villages. Their access to information and their ability to verify the accuracy of information enable them to make informed choices and decisions, which results to profound feelings of comfort. Wellness is also felt as they are enabled by access to communication to gain modest savings and to make their day a bit more productive. Seeing the presence of government and receiving its assistance in their everyday life and in moments of emergencies or disasters result to a feeling of security, which is also a dimension of their sense of wellness.

End-users' feeling of wellness is situated within the context of improved social ties by the effective performance of their social roles and the mutual satisfaction of needs, as prescribed by their emotional beliefs. The VBTS network provided not only opportunities to strengthen personal relationships, it also became a conduit for end-users to utilize these relationships to address specific needs and bring about mutual gain. These affective evaluative statements could be articulated using the vocabulary of social capital, which tend to dominate conversations about development projects such as community cellular networks. [1]End users were said that VBTS improved bonding in terms of personal ties, enabled more efficient bridging in terms of business transactions, and facilitated linking in terms of access to government services.

Community Cellular Networks as Inclusive Technology

The argument of this paper, however, is to give emphasis to these affective statements. While the structural sources of poverty, income inequality, and the overall precarity of life in these last mile areas are not yet resolved, dramatic increases in income that may be sustained long enough to effect qualitative changes in life-chances (Breen, 2010) in last mile areas would not be immediately discernible. The emotional relief, however superficial or fleeting, brought about by inclusive development interventions such as the VBTS should be compelling enough for both government and big business to leverage resources in these last mile villages. Thus, the business viability of village-based technologies, such as the VBTS, should not be a burden to the village alone. Access to communication technologies should be seen as a form of social service and social infrastructure development.

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Endnotes

[1] Hawkins and Maurer (2010) identified the dimensions of social capital as bonding among homogeneous group, bridging across heterogeneous groups, and linking groups across positions of power.

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