Communicative Assemblages of the *Pisonet* and the Translocal Context of ICT for the "Have-less": Innovation, Inclusion, Stratification

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This article examines the translocal context of emerging information and communication technology (ICT) for the "have-less," with a focus on public access ICT that emerged to become popular in low-income communities in the Philippines: the *pisonet* (one-peso net). Drawing from two years of in-depth interviews and participant observation in slum communities in the Philippines and reviews of ICT governance reports, the case examines how the pisonet emerged and diffused, and the communicative assemblage: a complex interplay of global technological discourses, national ICT governance mechanisms, social innovators, spatial conditions, and socioeconomic context that together forge the development of particular ICT ecologies and shape techno-social practices in this locale.

Keywords: communicative assemblage, ICT governance, digital inequality, slums, pisonet, information have-less

This article examines the development of the *pisonet (one peso-net)*, a popular and emerging form of Internet access for the "have-less" (Qiu, 2007) in the Philippines: people who are of lower socioeconomic status but have begun to adopt information and communication technologies (ICTs) on a massive scale. The pisonet functions like any computer we know—beneath a bulky wooden casing is a computer. The main difference is that the pisonet*, akin to a *videoke* machine both in look and in operational mechanism, is coin-operated and allows 4–7 minutes of Internet access for a peso ($0.02). A user can then slot in additional coins to continue access. Connected to the unit's monitor is a timer that tells the user how much time is left for access and beeps to warn the user that only a minute is left (Figure 1). Operated as independent microenterprises by local entrepreneurs, pisonet units are set up either right along street alleys in slum communities or in makeshift enclosures such as annexes of houses (*silong*) that form "computer shops."

*Figure 1. The pisonet. A computer in a locked wooden casing,
it runs with a coin-operated mechanism and a timer.*

The article will situate the conditions and translocal context underlying the emergence of the pisonet vis-à-vis mobile Internet and cybercafes as a communicative ecology of ICT in slum communities. I aim to answer the following questions: How did pisonet units emerge within an ecology of ICTs? What are the formation processes of this low-cost technology at the transnational, national, and local levels? Which economic, political, and social processes and which institutions affect access to and the use of the pisonet? What characterizes this technological artifact, and how is its purpose perceived? Who are using it, and how are their experiences related to ICTs shaped by the neighborhoods in which they live? I attempt to show how technology is situated within a particular constellation of power relations and inequality, and I explore how the development of social networks and technological capacity is facilitated, constrained, and mitigated by the technological and social capital resources embedded at the community and neighborhood levels. The nature and extent of such community resources are determined by processes constituted on the urban, regional, national, and even global scales.

I adopt the notion of *communicative assemblages* (Slater, 2013) to examine the confluence of

conditions and factors influencing media development, sense-making, and practice in low-income communities in Manila. According to Slater (2013), dominant analytical frameworks in media and communication studies have been applied to frame social thought and action, yet they carry with them predominantly Western or Northern "cosmologies," "preoccupations," and assumptions about the world. The concept of "access," for example—also problematized—denotes a top-down placement of technology for use by recipients in marginal communities, but negates the complex interplay of communicative assemblages that create meaning to the technology and shape practice. Recent research has raised criticism about the theoretical limitations of analyses of technological engagement that fail to address the "have nots" as "differentiated, possessing agency, or embedded in place" (Gilbert, 2010, p. 1003), or that do not unpack the importance of intersecting relations of power and inequality operating at and through multiple scales—essentially where technological development intersects with community development contexts (Arora, 2010; Donner, 2015; Rangaswamy & Arora, 2015; Rangaswamy & Cutrell, 2012; Shruti, 2017; Slater, 2013; Soriano, Cao, & Sison, 2018).

In underscoring the social history of technologies, the linkages between the symbolic and the material are highlighted (Gillespie, Boczkowski, & Foot, 2014). While the emphasis toward a constructivist, culturalist line of analysis that privileges the technologies' social and cultural meanings is an important advancement, some of these tend to sideline the analysis of the material nature of communication and media technologies (Lievrouw, 2014). As the material components of technology become products of abstract social forces and human agency is highlighted, the power and relevance of material artifacts in influencing human action and formations also need emphasis. The challenge is to interweave the materiality of technological artifacts with the social, political, and cultural negotiation as codetermining factors of technological development (Lievrouw, 2014).

Traced back from French philosophers Gilles Deleuze and Félix Guattari, the notion of an assemblage (*agencement*) consists of a "multiplicity of heterogeneous objects, whose unity comes solely from the fact that these items function together, that they 'work' together as a functional entity" (Patton, 1994, p. 158). An assemblage brings heterogeneous parts together to form a whole and is relational and caught up in a dynamic of deterritorialization and reterritorialization. A focus on assemblages emphasizes an arrangement of people, signs, objects, institutions, and culture and has distinct utility for analyzing the interrelation among power, politics, and space (Müller, 2015). *Communicative assemblages* (Slater, 2013) refers to "the bricolage that goes into conceiving, constructing, maintaining, repairing, and operating communication systems out of the socio-technical materials" (p. 123). An assemblage works by virtue of its own characteristic set of operations; these create physical and cognitive spaces that introduce processes and construct action (Deleuze & Guattari, 1987).This implies challenging the notion of "new media" or ICTs (Slater, 2013) in terms of what they are, in that assemblages encompass the complex interdependencies of historically and culturally entrenched components that make up communicative spaces at a temporal moment and that prior academic conceptions about new media or ICT may be unable to capture. The notion of an assemblage is compelling because "it suggests a phenomenology of seeing things in and of themselves, rather than assuming what they can or cannot do" (Banaji, 2017, p. 175). A critique of Hutchby's theory of affordances is the overstatement of the stability of the technological artifacts' features and neglecting interpretive flexibility (Lievrouw, 2014). The second notion of assemblages responds to this critique by pertaining to objects with divergent functions that are transformed into new configurations driven by local cultural practices. Other objects may be inserted into the technology as they attain usage and meaning. Framing ICTs as assemblages also resurfaces the

connectedness of communication systems with social systems, reflecting how technological features shape social relations, but also how social contexts shape technology use. In situating technology development and usage as a situated social practice, the goal is to delve into the human imagination and enactments with computers and the Internet, "where technology can be viewed as an artifact and technique of human invention that shape *[sic]* and is shaped by social learning with often unpredictable consequences" (Arora, 2010, p. 2). This approach is attuned to ethnographic inquiry because it draws focus to grounded theorizing on how the Internet is accessed, used, and configured locally and helps challenge taken-for-granted categories.

I extend the concept of communicative assemblages to analyze the role of sociospatial conditions, economic realities and the confluence of market, national ICT governance mechanisms, and the global technological environment that together forge the development of particular ICT ecologies and shape techno-social practice in a locale. This study interrogates how these assemblages interact through the mechanism of the pisonet. The interactions among urban space, social relations, the materiality of technological artifacts, and emergent digital cultures are examined from the daily activities and experiences of economically marginalized urban youth in Manila. The findings discussed in the following sections center on how ICT available in low-income communities also exists within a particular assemblage of power and social relations, yielding sociotechnical practices in the everyday lives of the have-less.

Field Sites and Methodology

The Philippines is one of the Asian countries with a significant slum population. In 2014, 17 million Filipinos, or 38.3% of the urban population, lived in slums (United Nations Human Settlements Programme, 2016). Slums are informal settlements that can be found across the metropolis, and slum dwellers are among the most vulnerable populations because of congested residential areas and poor living standards, such as inadequate water, small and insecure living space, and poor sanitation (UN-Habitat, 2003). Although slum dwellers are generally regarded as low-income people, they differ in the resources that they lack, and slums are sites of inequality as well as creativity and innovation (Ballesteros, 2010; Owusu, Agyei-Mensah, & Lund, 2008). Further, their proximity to urban centers and everyday exposure to establishments and major modes of transportation afford slum dwellers material aspirations.

Our study is situated in slum communities in Metro Manila—*Barangay* (village) 649 of Baseco, Barangay 717 and 718 in Malate, Manila, and Barangay North Daang Hari in Taguig City—and in one slum community in Legazpi City, Albay. The data presented in this article are generated from ethnographic interviews with 65 young people (aged 12–22 years), participant observation, participatory mapping exercises and diaries, and interviews with the owners and managers of pisonet units and cybercafes conducted between July–October 2015 and again in July 2018. Drawn from a media ecology framework (Horst, Herr-Stephenson, & Robinson, 2010), questions for youth respondents focused on what modalities they use to access the Internet, the social context of use in varied access modalities, and the activities that they do online. During interviews, we invited the users to show us how they use mobile devices and the pisonet. Twenty respondents participated in a one-week media diary on how and for what purposes they accessed and used the Internet using various modalities. Participatory mapping exercises were conducted to help plot the location of public Internet access points in the community, along with

participant observation in the pisonet, to better understand the context of use. Interviews with owners and managers of pisonet units focused on the nature of access in those spaces, services offered, and regulatory mechanisms, as well as the activities conducted by young people in those spaces. To understand the ICT governance landscape surrounding the pisonet and broader Internet development in the country, news articles, official documents, and industry reports on ICT governance in the Philippines were used.

In the following sections, I discuss communicative assemblages: (1) confluence of global ICT for development discourse, national regulatory environment, and ICT aspirations in the margins; (2) social innovation and "have-little" ICT entrepreneurs; (3) spatial and socioeconomic realities, and (4) sharing economy and social ties that shape ICT development, appropriation, and practice in slum communities.

Global ICT for Development Discourse, National Regulatory Environment, and ICT Aspirations in the Margins

Amid the logic of "digital or social inclusion" by international development organizations and governments, the discourse surrounding "access for all," "universal right to information" and "democratization of ICT" created the imperatives for facilitating access opportunities to bridge the "digital divide" (International Telecommunication Union, 2018). Highlighting the promise that connectivity to the Internet will facilitate poverty alleviation or economic development, the discourse has been embraced in the Global South—from Argentina, India, Bangladesh, Ghana, and the Philippines (among others)—where various modalities, from cheap mobile plans to government-run telecenters to privately owned cybercafes, have emerged to form the ICT landscape of the past decades (Kumar & Best, 2007; Proenza, 2015; Slater, 2013).

Some key transformations have been under way in the Philippine telecom industry that set the landscape for the emergence of the pisonet. A major aspect of this transformation is the overall modernization of Asian economies, including the Philippines, "which has led to growing geographical and social mobility among classes, including the information have-less" (Qiu, 2007, p. 909). A new set of market dynamics emerged with this development, which includes primarily the increasing informational demands of the have-less. As Filipinos achieved local and global labor mobility, telecommunications became more important than ever. Many slum-dwellers based in Manila, for example, are local migrants from across the archipelago who moved to the city to pursue employment aspirations. The search for education and employment and the need to stay in touch with family and friends who have moved to the city or overseas for work is set against the landscape of available ICT and media development overseas. Filipinos who obtained exposure to this development are compelled to obtain the same opportunities for networking and economic productivity imagined to be experienced elsewhere. It is within this context of mobility and structure of social stratification, to include the growing consumption capacity of the have-less, that the pisonet has become a popular technology.

Although I would argue that the pisonet is mainly driven by the improvisation of local entrepreneurs as the main change agents, its model lies in numerous social innovations. These take place in the backdrop of IT hubs and technology business centers in the country, state, and international

development-driven universal access policies, and mobile development in the country. This is situated within systematic attempts to provide and improve low-end Internet access and information services under the banner of "universal access," driven by the dominant neoliberal agenda of ICT as development tool.

From a focus on the provision of landline and community telephones to reach the last mile, the Philippine Department of Information and Communications Technology (DICT, or Commission on ICT when the policy was enacted) broadened its target to include citizens' access to online services through the Community eCenter (CeC) project (Department of Communication and Communication Technology, 2014). Drawn from the global experience of state-sponsored multimedia community centers, telecottages, and public libraries established to facilitate shared access to technology at little or no cost (Selwyn, 2003) and following the push from various international institutions and funding agencies (Proenza, 2015), this CeC project envisioned setting up public ICT access points in all municipalities in the archipelago. A CeC would usually have a set of computers and other services, such as printing and scanning. While some CeCs have received positive reception in some communities, others were left underused because of their location (i.e., in local government offices), intermittent connectivity, absence of technical/peripheral support, or inability to connect to local networks, similar to what was observed elsewhere (see for example, Kumar & Best, 2007; Slater, 2015).

Within the backdrop of the CeC project implementation is the explosion of the growth of mobile telephony, with state and development organizations claiming that mobile services will be the way to go. When the market for mobile subscription among middle- to upper-class Filipinos became saturated, telecommunication networks began to focus more on low-income users, targeting as a user base (and with much success) peasants, fisherfolk, and the rest of the working class in television advertisements. With innovative packages such as the introduction of the prepaid scheme*, pasaload* feature (phone credit transfer in small increments) and other low-cost plans, mobile communication became the primary form of communication in the country, with a staggering 132.6 million connections (124% SIM penetration rate) in the fourth quarter of 2018 (GSMA Intelligence, 2018a)[2]. This is also facilitated by the availability of low-cost and secondhand devices from China and Malaysia, some of which are locally assembled, that cater to this market. In 2011, the bottom of the pyramid in the Philippines was reported to spend the most on mobile phone services, more than double the percentages for neighboring Asian countries such as India, Sri Lanka, and Thailand (Aguero, Da Silva, & Kang, 2011).

Mobile Internet services were gradually provided, with operators offering bundled promotion and attractive schemes. Although smartphone adoption continues to grow, at 67% of the population, mobile Internet penetration rate of 40% (or 65 million with no access) with 2G and 3G connectivity at 90% (GSMA Intelligence, 2018b) has the Philippines lagging behind neighboring countries Malaysia, Thailand, and Vietnam. In 2015, Facebook partnered with Globe Telecom (Globe) and Smart Telecommunications, Inc. (Smart) to provide no-fee access to Facebook and to certain news, health, job, and other services,

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[2] This figure pertains to total number of mobile connections in 2018, indicating that some users subscribe to more than one network. Only 2014 figures are available for unique subscriber data, which indicates a 50% penetration rate (GSMA, 2014).

along with a suite of other promotions that can be accessed using feature phones. Despite other governments' rejection of Facebook's Free Basics program (e.g., India) given concerns about net neutrality (Bhatia, 2016), the Philippine government, with its laissez faire attitude toward Internet regulation and weakness of regulatory bodies, embraced the Free Basics scheme under the banner "Internet for all." Smart also launched the Wikipedia Zero offer, providing unlimited access to m.wikipedia.org, zero.wikipedia.org, Wikipedia apps (available on iOS and Android devices), and other Wikimedia sites on mobile devices, free of data charges (GSMA Intelligence, 2014). These promotions were taken up broadly by young people from the middle- to low-income markets and continue to significantly influence the dynamics of online access.

However, mobile Internet has material requirements, such as access to an Internet-capable phone and money to buy credit for accessing data plans or Wi-Fi, which many young people in low-income communities are still unable to afford. Cheaper units and free access promotions imply slow connectivity and data caps that limit what young people are able to do on the Internet (Donner, 2015; Proenza, 2015). Although some youth interviewed acquire higher end brands like Apple or Samsung, the models are often old. Some of the participants or their families own locally assembled or secondhand feature phones. These devices can fulfill basic user needs, such as messaging, calling, playing games, watching videos, and browsing Facebook without the huge costs required for high-end brands. However, low-end units have poor capacity and limited features, and some are prone to breaking down. While sophisticated devices have a slew of unique features (e.g., good-quality cameras, improved battery life, high processor and memory capacity), low-end units have basic functionalities that are nonetheless able to cater to basic needs such as socialization, information seeking, and entertainment.

Very few of the youth we interviewed had families who subscribed to Wi-Fi to access the Internet through their mobiles. On occasion, users would connect for free using Wi-Fi connections provided by private establishments near the community. Mobile users mostly rely on mobile data plans that they can pay in smaller increments. Whereas a monthly Wi-Fi subscription would cost around a thousand pesos (US$20), many would prefer to go for mobile data plans that cost 15 pesos (US$0.3) for a day or 50 pesos (US$1) for three days, which already come bundled with free SMS. In reality, however, this Internet access can be very slow and intermittent. Akamai Technologies, Inc., which releases regular "State of the Internet" reports showed the Philippines to have the slowest average Internet connection speed in the Asia-Pacific region for 2016 and 2017 (Barreiro, 2017). Further, OpenSignal's (2018a, 2018b) reports from its comparative analysis of mobile network quality globally indicate that the Philippines offers significantly worse mobile internet speeds and availability as well as the poorest mobile video quality than other countries analyzed.

Apart from geographic difficulties of laying down the necessary infrastructure across the archipelago, the absence of meaningful competition for dominant players has not posed ample pressure to improve the quality of Internet connection in the country. Because of huge infrastructure investment cost and tedious approval processes, provider Philippine Long Distance Telephone Co. (PLDT), which also owns Smart, "controls much of the infrastructure, allowing it to charge fees higher than elsewhere in Asia despite a relatively poor population" (Jennings, 2016, para. 3). As of 2012, there were more than 350 Internet service providers (ISPs) in the country, and most of these ISPs connect through PLDT's network

(Foundation for Media Alternatives & The Citizen Lab, 2017). Currently, only two mobile Internet service providers dominate the network: Globe and PLDT/Smart. Options exist for users to obtain high-speed Internet connectivity, but the cost is often prohibitive for low-income users. High-speed service costs about US$57 per month, more than in the United States and Australia (Jennings, 2016), and this makes it difficult for many users to rely on mobile Internet as a preliminary access point. Although Facebook's Free Basics provides access to one of youth's favorite sites, Facebook, it provides limited access to other websites, and a data plan would be necessary to access images and videos. As narrated by some of our youth respondents, access to the Internet using Free Basics can be extremely slow: "takes forever to open up the page." The speed also depends on the time of use, and young users are aware of these "peak" and "off-peak" periods. This aligns with the findings of Global Voices (2017), which criticizes Free Basics for bringing an imbalance to local content and mobile subscription markets, creating a "poor Internet for poor people" that does not allow users to explore and discover the global Internet. In sum, low-end units plus cheaper Internet access promotions imply slow connectivity and data caps that heavily limit what youth are able to do on the Internet; this compels many of them to continually rely on public Internet access points. Broader policy directives resulting from a confluence of global, national, and local actors shape the realities of access in the locale. In the Philippines, the inability to drive meaningful competition in the telecommunications sector has led to the continued popularity of the pisonet.

Pisonet units appear to democratize the online, providing moments of accessibility through a coin-run mechanism. In comparison to the cybercafe model, which facilitates Internet access for P20–30 (US$0.40-0.60) an hour, often in malls and business centers, the pisonet is a jukeboxlike facility that allows minutes of Internet access for a peso. The pisonet design has a striking likeness to two locally popular technologies, the *videoke* machine and gaming arcades. Apart from its coin-slot mechanism, the pisonet is also hosted in a sturdy (often retro) wooden casing, primarily to protect it from theft, but also from sun and rain given that it is commonly placed in public spaces. Appropriating the design for Internet use of a familiar technology such as the videoke or arcade model is clever given that these units easily blended into the local community as a facilitator of entertainment and community sociality. Found in public alleys, the pisonet can be paralleled with older models for neighborhood public sociality whereby public spaces become spaces for social gatherings and familial networking.

Pisonet units are set up right along slum alleys, or a set of networked pisonet units is placed in makeshift enclosures in housing extensions, forming "computer shops"—a public access space akin to cybercafes (and similar in functionality), minus the comfortable chairs and air conditioning (Figure 2). Computer shop setups are connected to networks that can expand their functionalities, like printing or local network gaming. Because computer shops are run by owners with relatively advanced knowledge of computers and networking, they equip the units with antivirus software and configure them to block attempts to personalization. Technically, pisonet units can accomplish tasks that can be done in computer shops, but the inherent limitations of pisonet units, such as being encased in a secure box and being positioned along slum alleys, restrict the pisonet's functionality (discussed in a later section).

Social Innovation and "Have-Little" ICT Providers

The narrative of "providing access to the last mile" often carried assumptions of top-down

technological placement with state or international development organizations deploying ICT to people. This is problematic and dismisses the role of social innovators and sociotechnical dynamics driving uptake and use. The rise of the pisonet and computer shops in low-income communities is facilitated by an economic underclass that is technologically savvy and the availability of cheap hardware. The creation of the Facebook Group for Pisonet Owners of the Philippines manifests an expanding informal association of owners and managers who exchange knowledge on how to assemble and set up their own pisonet units and which applications and services to offer.

Figure 2. Male using a pisonet along a slum alley in Manila.

The rise of the pisonet in the early 2010s made Internet access much cheaper and more widely available to low-income users. Invented as a rural counterresponse to Dagupan City's booming Internet shop/cafés, pisonet units soon spread to various regions of the country (I visited and observed the use of pisonet units in the provinces of Cebu, Bicol, Dumaguete, Iloilo, and Bulacan, although the detailed results of this extended study are not covered in this article). Their proliferation in low-income neighborhoods saw a closure of some Internet cafés as their clientele favored locally placed pisonet machines, often a few steps away from homes. The low entry cost of access—one peso—allows a user

with meager savings from a school allowance to access the unit, albeit for a limited period. This is akin to the "sachet economy" popular in slum communities, where commodities such as shampoo, toothpaste, and even mobile phone credit are repackaged in small increments to make them accessible to people of limited daily income (Ballesteros, 2010). More recently, the pisonet has been joined by a new scheme that is sprouting in different areas of the country, "piso Wi-Fi," meant to facilitate cheap access to the Internet using mobile devices. How the popularity of the piso Wi-Fi will impact the pisonet over time would be interesting to follow.

In Metro Manila, one brand new ready-to-use unit with the coin-slot facility costs about P9,000–13,000 (approximately US$250–$300). Some pisonet owners we interviewed obtained them from informal/black markets on an installment basis or relied on secondhand units to decrease the investment cost. The pisonet owners would then get a broadband plan costing P999 or P1,300 (US$20–$25) monthly, which two or more computers may share. Informal and formal economies come together in spurring the pisonet market for low-income communities. When pisonet units became popular, PLDT launched Cyberya, offering pisonet units bundled with broadband Internet connectivity to entrepreneurial Filipinos who want to start their own small business via Internet rental service. According to our interviewees, the pisonet business helps provide for the needs of their families, allowing them to earn anywhere from around P300 or US$7.5 (at low or rainy season) to as much as P600 or US$10.2 per week (during peak periods). Its low-maintenance design implies that the pisonet entrepreneur also acts as its caretaker/manager, responsible mainly for changing coins and ensuring that users do not steal the unit. In slum communities, the financial resources of both entrepreneurs and patrons are scarce, and many have reduced resources that could improve the facilities' aesthetic and functional value (Figure 3).

The coin-operated nature of the pisonet does not mean that the pisonet or computer shop manager does not have an important role in the governance of this technology—whether it is placed in the slum alley or in an enclosed space (i.e., computer shop) determines the way users access the technology. These micro-entrepreneurs also dictate whether to restrict access to certain sites, whether to ban students from use, whether to add peripheral devices to the unit, and whether to place CCTVs in their shops or across their pisonet units for monitoring purposes. Similarly, the units are configured by their owners. More recent designs allow for a choice of one-peso or five-peso coin slots (observed in Baseco and in Legazpi City), and the owner can configure the system in terms of how many minutes of Internet access one peso or five pesos will enable. Some pisonet units we observed offered between 4 and 7 minutes of Internet access for a peso.

As a local enterprise, the future development of the pisonet will be connected to the social position of the owners. Many of the local entrepreneurs do not own the land on which they set up the pisonet units, and this discourages them from further expanding the business or investing in enhancement features. I asked one pisonet manager if she intends to expand her business over time. Manang Aida (pseudonym, 43, female, Baseco), explained,

> I already expanded this, from one computer, I now have two units. . . . There were
> talks that the local government will be stricter in its regulations because of fights that

occur in cybercafes. But that's for the cybercafe—we only have pisonet and our clients are usually only small children. I don't know, maybe I will wait for a while. As you know, we don't own this land, and I don't know if we have to move eventually. [translated from Filipino]

This example highlights the entanglement of ICT development, entrepreneurship, and the precarity of living conditions of some slum dwellers. Manang Aida shared that she and her husband moved to Manila from Samar province. Since moving to Manila, her family transferred to two slum communities because of government slum-clearing operations before landing in Baseco. She has been living in Baseco with her family for more than eight years, but she is still uncertain about the security of her tenure there. Some shops operate without local permits and paying local taxes, whereas others, depending on local government imperatives, have more stringent policies. In a local village in Legazpi, Albay, for example, more advanced local government policies for pisonet and computer shop businesses are imposed. For example, establishing a computer shop housing three or more pisonet units requires a sanitation permit (to ensure that the pisonet caretaker is healthy), a fire safety permit, and a local business permit. Such policies are not commonly available in slum communities in Manila, where many pisonet shops operate without much intrusion by the local government despite worries about cybercafe crackdowns by the owners. In contrast to alleyway pisonet units, computer shops with networked units are run by managers, and, based on interviews, these managers feel more accountable to their communities. Aside from banning children, some of them restrict the entry of students in uniforms during school hours or those whom they do not trust depending on their reputation in the community. This implies that computer shop owners serve important roles as community regulators and largely determine what they consider "crucial" for Internet access, as well as ethical-moral dimensions of access, parallel to what Sreekumar and Rivera (2016) found in cybercafes in other Asian cities. As Sreekumar and Rivera (2016) argued, global technologies are shaped by local realities as local stakeholders struggle to redefine boundaries of morality, safety, and privacy, balancing these against necessity and opportunity drawn from the technology's material affordances.

Space and Inequality

The element of space plays an important role in shaping the nature of communication in marginal communities. The availability and choice of communication devices are shaped by the availability of space and the social arrangements that characterize the space (Gilbert, 2010). Whereas ICT and media users in affluent or middle-class contexts may see space as becoming less relevant, space as entangled with socioeconomic context is an important dimension of the communicative assemblage in slum life (Arora, 2010; Gilbert, 2010; Rangaswamy & Arora, 2015; Rangaswamy & Cutrell, 2012).

Because space is a luxury in Manila slums, many do not have personal computers at home and rely on mobile devices or public access ICT. One pisonet owner in Malate said that she and her husband managed to save up some money to buy a secondhand computer for her children's use. However, because of the cramped space inside her house (measuring around 15 square meters) and the fact that her niece, her nephews, and her children's friends also take turns borrowing the computer, they found it difficult to maintain a computer inside their house (Soriano et al., 2018). The positioning of the pisonet along slum

alleys is driven by the lack of space or lack of sufficient capital for the owners to establish a cybercafe or computer shop environment. Maintaining the computer and Internet connectivity and recognizing that relatives and neighbors also visit their tiny home to use the computer, they decided to have it set up as a pisonet unit outside their house; in turn, the unit serves as a source of livelihood. However, because pisonet units are positioned along slum alleys, they cannot be used during heavy rains and floods, so they are inaccessible to those who rely on them as a primary form of access. The example shows that although one may be able to acquire a computer for family use, space as embedded within social ties and the owner's socioeconomic capacity influence the choice to either maintain a personal computer or convert it into public access ICT. The conversion of the technology from home-based to public access, however, does not necessarily make it private or public. Through practice, pisonet owners experience home-based PCs as public access technologies that are used by a slew of neighbors and extended family members inside the house; similarly, a public access pisonet, by the owner's choice, may be withdrawn from public use through makeshift enclosures and access restrictions.

The location of the units along slum alleyways also shapes their design and function as extensions of common spaces, while shaping practice. To avoid theft, pisonet units are enclosed in a locked and chained wooden casing that disables USB slots, and the owners provide few peripheral devices, such as headsets and printers, that may be prone to theft. Chairs are often not provided because they add to the maintenance cost and take up space along slum alleys. Instead, owners set up wooden benches, planks, or movable plastic chairs for easy storage at closing time. The absence of USB ports and Microsoft Office features for pisonet units located along slum alleys discourages the use of the units for editing and saving projects. Although research for information is one of the activities conducted by youth on the pisonet (alongside Facebook, YouTube, and gaming), many users shared that they would have to go to a computer shop for typing, editing, and printing. The absence of comfortable chairs discourages prolonged use (although based on our observations, some younger users would spend hours on pisonet units, taking turns, sometimes even while standing). The absence of headsets (speakers are more common for pisonet units along slum alleys) or printer connection also affects what activities users will and can do around this ICT. This explains why pisonet units are more actively used for social networking, gaming, and viewing YouTube videos, as was apparent in the interviews and media diaries we received from the youth. Pisonet units in enclosed computer shops tend to offer headsets attached to the units, making them more conducive to voice chats and more intensive gaming.

Because of the emplacement of the pisonet at the heart of slum neighborhoods, they are sites that local youth visit once they wake up in the morning. One common appeal of the pisonet to youth in slums is that it is not "restrictive" (unlike cybercafes with "many rules of use"), and it is considered a "more convenient" and "natural" form of access. Youth describe (and we observed) that they can freely eat, drink, smoke, and curse while using the pisonet, behaviors that are often restricted in mall-based cybercafes. Further, as public access points, computer shops and pisonet units naturally expose users to spectators, making everyday access public. This implies that users share experiences, such as playing games together or communally watching a missed television program or sports match, via the pisonet. However, the same spatial configuration of the units exposes users to unwanted spectators who may also be unwilling to witness activities unfolding within earshot. The access arrangement offered by the pisonet manifests the importance of space, but also its implications to asymmetries of access. The shared nature

of this technology implies that the units offer little configuration and portability for users. Unlike with mobile devices, which afford users flexibility in use and configuration, sites to visit, or applications to download, users of pisonet units rely on applications, software, peripherals, and other access arrangements made available by the units' owners and managers.

Socioeconomic Realities

In slum communities, the economic dimension is very much tied to the spatial and the social. Our youth informants see mobile Internet as aspirational, and they perceive the use of more expensive mobile units and models as translating to higher social status (Portus, 2008); however, they face restrictions on access to and choice of communication technologies because of financial limitations. Many of the young people we interviewed do not own Internet-capable mobile devices, although they may have experienced intermittent use by borrowing handsets from their parents, siblings, friends, or partners. Mobile devices are considered "assets" like jewelry, which can be readily pawned or sold. In turn, young people who pawn or sell their devices end up having to share devices with other family members until they find a way to acquire another device. The quality of access also shapes youth's Internet usage and the meaning that these youth attach to the unit's affordances. Some youth consciously refrain from activities that consume significant amounts of data, such as watching YouTube videos, akin to Donner's (2015) concept of the "metered mindset" in which youth only "sip and dip" from the Internet. Some users have only visited the Internet on the basis of what free sites are bundled with the promotions that they can afford. The quality of access that users receive from mobile Internet has created the continued need for the pisonet in this particular socioeconomic context.

Interestingly, the pisonet appears to closely approximate the experience of mobile Internet for these young people. Similar to mobile Internet use, young people use the pisonet units sporadically—for checking their Facebook feeds, messages, or whether people have liked their posts—and the coin-slot facility makes it conducive to access in small increments. Pricing is a key driver for ICT uptake. As an extension of the "sari-sari" (variety) store and sachet economy popular in slum communities in the Philippines, the pisonet represents the most "sachet" of sachet Internet-access modalities:

> Popoy (pseudonym): If I only have a few pesos and only want to check Facebook, the pisonet is the best for me. Unlike the computer shop, they will not give change if you use the computer for less than 1 hour or the 30-minute reserved period. In the pisonet, you really get your money's worth, and the Internet connection is good. . . . Also, if I have 12 pesos, I can't use the computer shop.
>
> Interviewer: Doesn't the computer shop allow for 30 minutes of access?
>
> Popoy: Yes, that's 10 pesos, but what about the remaining 2 pesos? You can no longer use it in a computer shop. *(Interview with a pisonet user, 16, male, Baseco, translated from Filipino)*

As the cheapest mode of access in this communicative ecology, the pisonet may be construed as compromising functionality because of limitations in terms of services and absence of security or privacy mechanisms. However, the youth who use the pisonet as a primary access point know no other way and have evolved cultures of use for this particular technology. To them, it functions like a mobile phone: It is used mainly for short but frequent activities, like checking updates on Facebook, replying to short messages, or watching missed shows on YouTube. It is common to see youth taking turns slotting in coins or swarming around the units. There are few rules on the use of the pisonet, and the restrictions are less standardized than with computer shop units. According to our respondents, the pisonet is understood to cater more to children, and older youth would prefer to access the Internet through computer shops or mobile devices if they had more financial resources. As with other public access ICTs, access ends when the units are closed or when one is barred from use.

Patrons usually go to computer shops when they are doing "research" for school (i.e., assignments or projects), when they want to game with friends (for those who have more advanced skills and a higher gaming budget), or when they want to use chat facilities such as Skype, given that most shops offer headsets. Although users can socialize and consume media, computer shops are mainly used when users need to complete tasks that cannot be accomplished using a pisonet unit or mobile device. In computer shops, one can save files to his or her own choice of storage, use productivity suites, and, depending on shop configuration, access a printer, scanner, or photocopying machine and some technical support. Games that require better computing power, a faster Internet connection, LAN features, larger displays, and better sound or paraphernalia are played within cybercafes or gaming hubs with much higher costs. Although the computer shop and cybercafe represent the best form of access in terms of functionality within this ecology, entry to the computer shops requires a relatively larger amount of money up front and the need to meet some basic "entry requirements," such as changing a shirt or taking a bath. Sometimes, age is also a determinant for access; shop owners may explicitly bar children from entering because they assume that children have no capacity to pay and will just cramp up the space (Soriano & Cao, 2017). In pisonet units, spectators are welcome and benefit from access in the same way as those who have peso coins.

In figuring out what older youth do with the pisonet, I learned that beyond social networking, watching YouTube, or gaming, some of the youth use the pisonet for exploring employment opportunities and sometimes performing digital labor through computer shops with networked pisonet units. Some youth perform parceled-out jobs such as digital marketing or encoding for local or global companies, which manifests the materiality of digital labor performed in these culturally located technologies. This deserves focus for future studies on the materiality of digital labor in the Global South.

Sharing Economy and Strength of Social Ties

Consistent with the sharing economy in slums, it was common to see users consuming media in the pisonet collectively while taking turns slotting in the coins. Users young and old, parents and their children, watch YouTube videos together, browse Facebook together, or play games together (Figure 3). At night, adults also collectively watch movies, missed teledramas, or basketball or boxing matches on YouTube. In slum communities, public access ICT means not only that it is not individually owned, but also

that the units are used by a number of users at the same time, allowing them to save on cost while shaping a communal nature of media practice. Interestingly, in one pisonet shop in Legazpi City, Albay, the list of users with pisonet debts and the amount they incurred is plastered on the side of one pisonet machine, indicating that even access to the pisonet is borrowed and works within a highly entrenched culture and economy of sharing. Aside from access, neighbors also evolved mechanisms of care for young users of the pisonet that remain tied to the collectivistic culture of slum life. Some communities impose curfews for pisonet use by minors and children, and this is easily enforced because of the units' exposure to the watchful eyes of parents and extended relatives. As some users transition to becoming employed adults, or as their relatives become capable of paying for exclusive Wi-Fi connectivity and smart devices, they find less need for the services of pisonet or computer shops, but still share these Internet connections with neighbors and relatives in the community.

Translocal Context of Media Development and Practice in the Margins

The dominant understanding of ICT in the Global South is hinged on a discourse surrounding the utopian vision of ICTs as development artifacts that can facilitate important social transformations, such as bridging the margins to the "information society." As manifested in a slew of ICT for development projects to reach the last mile—from the "hole in the wall" project to community eCenters and public libraries set up in low-income urban and rural villages across the Global South—the idea of ICTs as reproducible social processes is embraced by governments and international and local development institutions. Often, ICTs are also studied as mere "independent variables" expected to bring about social outcomes (Slater, 2015), and the pisonet, just like any other public access ICT, ought to be explored in terms of what outcomes it can yield. The analysis shows that understanding local meanings of particular ICT can emerge from unpacking the communicative assemblages constituting it. The intersections of global, national, and local conditions shape the media environment in this particular locale in the same way that the interlayering of spatial, socioeconomic, and cultural dimensions working through the ICT mechanism (i.e., pisonet) shapes the materiality of the technology and limits and expands local use, practice, and meaning.

Figure 3. Pisonet owner proudly poses with her pisonet units located along a slum alley in Manila. Along with sachets of coffee, shampoo, and toothpaste, she sells Internet connectivity at 4 minutes to one peso (US$0.02) in front of her "sari-sari" (variety) store. A mother and her child access the unit together.

The pisonet expresses bottom-up and locally contextualized "frugal innovation solutions" from the Global South that both respond to and challenge ICT for development discourses from the Global North. The foregoing analysis illustrates that although the pisonet developed as a result of broader technological conditions and global demands to broaden public ICT access, it does not fit the usual image of a telecenter model, and its character is shaped by a confluence of local ICT governance mechanisms, drive of local entrepreneurs, and spatial and economic dimensions that give it a distinct local value and meaning. Patterned after the logic of cybercafes and public libraries but facilitating a unique sociotechnical practice, the pisonet resonates with the sachet culture, sharing economy, and interpersonal networks that have been long been entrenched in everyday slum life. Access and effective use are not the same (Donner, 2015), and although cybercafes and mobile Internet schemes are available, the regulatory environment has not allowed for the quality and cost to facilitate effective use by low-income communities, leading to the continued need for the pisonet. Social relationships, communicative capacity, and cultural conditions unique to slum communities shape the meanings that users attribute to this Internet access modality; in turn, the pisonet also shapes the margins.

Digital and urban inequalities are mutually constitutive (Gilbert, 2010), and the ecology of ICTs in low-income communities emerges as a site for manifesting asymmetries in value and experience. For

young people who have no regular access to mobile devices or mobile Internet, the pisonet provides the closest approximation of flexibility of use that the mobile device affords. Young people's concept of the Internet in these communities is shaped by the conditions of technology and the norms of use. In turn, the pisonet has contributed to the continued remaking of the slums and the technological have-less (Qiu, 2007, 2009). The pisonet emerged with the popularity of digital technologies for connecting to the Internet, along with the aspirations, norms, and expectations of use from these digital technologies after which it is patterned. The way the technology was configured to cater to the have-less also constructs their marginal position in comparison with those who access smartphones and other digital devices from the comfort of their private spaces. Yet, the space that is configured by the pisonet folds and expands (Müller, 2015) as it is appropriated. While its use is located within a specific techno-social locale, it also reinforces neighborhood sociality and bridges low-income youth to global economies, networks, and imaginations of opportunity and agency. The multiplicity of dimensions constituting the pisonet serves as a site of communicative opportunity and as a source of digital inequalities.

To speak of the pisonet as a communicative assemblage risks fostering the impression that we are concerned with a stable entity with its own fixed boundaries. By accentuating the emergent and fluid characteristics of this communicative assemblage, I also highlight the multiple unstable and constantly moving boundaries of institutional policies, local practices, and individual actions that construct the pisonet. Finally, despite the current media environment where geographic confines are easily transcended, the study shows that a focus on geographically bound communities still matters. Slums offer a rich site for analyzing sociotechnical practices and present new ways of thinking that challenge some assumptions about predominant understandings of "ICT" that are developed within affluent contexts.

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