El Paquete Semanal: The Week's Internet in Havana

Michaelanne Dye
Georgia Institute of Technology
Atlanta, GA, USA
mdye@gatech.edu

David Nemer
University of Kentucky
Lexington, KY, USA
david.nemer@uky.edu

Josiah Mangiameli
Independent
New York, NY, USA
jmangi13@gmail.com

Amy S. Bruckman
Georgia Institute of Technology
Atlanta, GA, USA
asb@cc.gatech.edu

Neha Kumar
Georgia Institute of Technology
Atlanta, GA, USA
neha.kumar@cc.gatech.edu

ABSTRACT

We contribute a case study of *El Paquete Semanal* or "The Weekly Package"—the pervasive, offline internet in Cuba. We conducted a qualitative inquiry of El Paquete through extensive fieldwork—interviews and observations—in Havana, Cuba. Our findings highlight the human infrastructure that supports this offline internet, rendered visible through the lens of articulation work. By offering an in-depth perspective into these workings of El Paquete, we aim to challenge established notions of what an (or the) internet "should" look like in more and less "developed" contexts. We highlight how El Paquete is a non-standardized and non-neutral internet, but still human-centered. We also offer an enriched understanding of how an entirely offline internet can provide expansive information access to support leisure and livelihood, additionally serving as a locally relevant platform that affords local participation.

ACM Classification Keywords

H.5.m. Information Interfaces and Presentation (e.g. HCI): Miscellaneous

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Cuba; internet; media-sharing; human infrastructure

INTRODUCTION

Internet access in Cuba is heavily restricted. However, millions of Cubans still engage with digital content through an informal, pervasive, offline internet known as *El Paquete Semanal* or "The Weekly Package". Every week, a new version of El Paquete (EP) becomes available, and includes a one terabyte (TB) collection of digital content that is distributed across Cuba on external hard drives, USBs, and CDs. This collection includes a variety of television, music, movies, apps, educational programs, YouTube videos, magazines, and news,

and costs between between 2-5 CUC[1]. EP also offers offline versions of popular websites in Cuba, such as Wikipedia and Revolico (an equivalent of Craigslist in the United States). Not formally sanctioned by the government, EP manages to facilitate offline access to local and international content regularly and affordably.

During the last decade, EP has emerged as the alternative network to both state-owned channels and the world wide web (WWW). Although the Cuban government is gradually increasing investments in internet access efforts, direct internet access remains limited and prohibitively expensive [11, 12, 34]. Additionally, state-owned media channels are severely limited in the content they provide. As such, this community-led information network is the primary medium by which Cubans receive and engage with local and international media, news, and entertainment. EP has even been recognized as the largest employer in Cuba [13]. It sustains both leisure and livelihoods.

We contribute a case study of EP, this pervasive, offline internet in Cuba. Drawing on fieldwork conducted in Cuba's capital city of Havana between 2015 and 2017, we highlight the human infrastructure that supports this offline internet in a technologically constrained environment. Human infrastructure consists of the people, relationships, and organizations that underlie the foundations of a system or network [24, 37]. The human infrastructure of EP is rendered visible through the lens of articulation work, which is the continuous efforts required to bring together discontinuous elements—of organizations, professional practices, and technologies—into working configurations [44]. By offering an in-depth perspective into the human infrastructure that sustains and grows EP, we aim to challenge established notions of what an (or the) internet "should" look like in more and less "developed" contexts. Our research highlights how EP is a non-standardized and non-neutral internet, but still human-centered. We also offer an enriched understanding of how an entirely offline internet can provide expansive information access to support leisure and livelihood, additionally serving as a locally relevant platform that affords local participation.

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[1]One Cuban convertible peso (CUC) is equivalent to one US dollar.

We begin by offering background information on the state of internet access in Cuba and a description of how EP addresses a critical societal need. We then situate our research in a body of related work that has examined offline internets and human infrastructure from a human-computer interaction (HCI) perspective. After describing our methodological approach, we detail our findings regarding the human infrastructure of EP, unpacking the articulation work performed by three distinct groups of individuals: *Los Maestros* (The Masters), *Los Paqueteros* (The Packagers), and *La Gente* (The People). Finally, we discuss how the articulation work performed by these actors sustains and grows an offline information network amidst a unique sociopolitical context. Here we analyze the dynamics of information procurement and dissemination that have emerged through EP to create a *personalized, negotiated* internet, an *entertaining, informative* internet, and a *relevant, participatory* internet.

Our research contributes to scholarship in the field of human-computer interaction (HCI) by emphasizing the human elements that support the existence and growth of an expansive information network. For the field of Computer-Supported Cooperative Work (CSCW), we strengthen prior research on the human infrastructure lens through our in-depth engagement with the articulation work that EP relies on. Finally, for the field of Information and Communication Technology and Development (ICTD), we extend a rich body of research on media-sharing practices and offline information networks with our case study of EP, as we highlight how its actors rely on it for leisure and livelihood, both generating and consuming locally relevant content.

BACKGROUND

Cuba is unique in its sociopolitical, economic, and cultural past. Below we provide a short primer on the history of Cuba and its current state of internet access, highlighting the palpable gap that EP addressed when it was launched.

Information Scarcity

Various structural forces have resulted in an environment of information scarcity for Cubans throughout the last six decades. Since the revolution in 1959, all business sectors have been under state ownership and Cubans' access to foreign press, entertainment, and other content has been heavily restricted [5]. Although various kinds of content are prohibited because they are considered controversial, other factors also contribute to a lack of information access. Access to online content has been nearly impossible for individuals due to the lack of affordable, high-speed internet access [2, 11, 12]. Moreover, the U.S. embargo of Cuba has prohibited American companies from conducting business with Cuba [2] such that legal purchase of copyrighted content is impossible. Despite recent allowances (such as Netflix's launch in Cuba), limited access to high-speed internet and unaffordable streaming services renders access virtually unattainable.

El Paquete Semanal

In 1996, Cuba was one of the first 'developing' countries to connect to the WWW. However, by 2001, its access to the internet was at its lowest as measured against the *"six dimensions of internet access"* [47]. In 2014, it was estimated that only 5-25% of Cubans had internet access, with only five percent of the population having full access to the internet (typically at their workplaces) [39]. This began to change in March 2015, when the Cuban government began to introduce public, paid WiFi hotspots across the country. These hotspots do represent an opportunity to connect for the average citizen, but are prohibitively expensive and slow [12].

Responding to the pervasive scarcity of information access, a group of individuals began distributing digital content throughout the country on USB drives around 2011. This was EP, an information ecosystem comprised of digital files, USB drives, external hard drives, servers, and computers, all interconnected through a human network stretching across the country [25]. Every week, this network undertakes the tasks of compiling the week's internet. Approximately three million Cubans access digital content on EP today, making it the most extensive information network in the country [28]. Although EP is not formally sanctioned by the Cuban government, the network has been allowed to continue and thrive. As a result, it not only provides an alternative to state-controlled media, but also offers a way for Cubans to sustain their livelihoods [8]. This has led to thriving media-sharing practices in Havana, to the point that social gatherings often revolve around media-sharing [2].

RELATED WORK

Offline Information Networks

We now review research related to offline internets, or information networks that are not digitally connected and operate in low-connectivity areas. EP operates as a highly sophisticated type of "sneakernet" [34], a network where information is passed around by hand. Prior work has examined similar researcher-led initiatives, such as DakNet [33], a kiosk system deployed in parts of rural Cambodia and India that used mechanical backhaul to provide services to users. Such offline information networks have been studied extensively in the field of ICTD in particular, with the goal of understanding how—and with what motivations—digital information is disseminated and consumed through offline connections [36, 46]. Other ICTD research documents instances of individual actors in resource-constrained environments engaging in sophisticated information-sharing practices to acquire desired media [9, 22, 31, 42]. Key relevant contributions in this regard include Smyth et al.'s research, which found that a motivation for entertainment drives urban Indian users to overcome social, economic, and technical obstacles that come in the way of accessing, consuming, and sharing media [42]. In addition, Kumar and Rangaswamy's analysis of the media-sharing actor-network in urban India demonstrated how the presence of mediators and intermediaries resulted in the decentralization of piracy and gradual promotion of digital literacies [22]. Both studies highlighted the leisure-based motivations that drive increased technological literacy, thereby bringing to question the oft-held notion that ICT interventions in 'developing' contexts should focus on targeting more traditional development outcomes, a notion that Arora and Rangaswamy offer a valuable critique of [1]. We extend this rich body of research on media-sharing with our study of EP. We also contribute to research that has been conducted on EP by Cuban scholars [27, 25, 10]. Our findings show that EP's information

network does not only provide a mechanism for access of entertainment media; in the absence of other means of information exchange, it also serves as the primary source for news, educational content, software updates, and classifieds, among other things. This versatility has led to EP's gradual evolution into a large offline information network that is used by the vast majority of the population, not only the "invisible users" on the margins [7]. Today, EP is a community-driven, robust, information network kept alive by multiple actors who undertake a variety of tasks. Our research highlights the ways in which these actors come together as the human infrastructure responsible for the sustenance and growth of EP.

The Human Infrastructures of ICTD

Research in the fields of HCI, CSCW, and ICTD has long recognized the importance of examining the infrastructures that support diverse sociotechnical systems. According to Larkin, infrastructures are *"built networks that facilitate the flow of goods, people, or ideas and allow for their exchange over space"* [23]. While there has been increasing work on social engagements with technological infrastructures, particularly in the 'developing' world [41, 30, 19], our work focuses on human infrastructures, defined by Lee et al. as *"the arrangements of organizations and actors that must be brought into alignment in order for work to be accomplished"* [24]. Extending this work, Sambasivan and Smyth focus on the human infrastructure of ICTD, illuminating the close proximity of the social and technological facets that make up information infrastructures against a backdrop of development [38]. These authors call for more work that considers human infrastructure as the *"inter-connected pieces forming a larger whole"* that include nodes and edges, hubs and spokes, strong and weak ties, and actors that enable or disable access to resources [38]. They advocate for a broadened understanding of infrastructure that goes beyond tangible artifacts to include *"social practices, flows of information and materials, and the creative processes that are engaged in building and maintaining these substrates"* [38]. They also advocate for more work that explores human infrastructures as a network. Our study of EP responds to their calls by emphasizing the community-building and long-term information infrastructure-building efforts involved in EP and how the human infrastructure serves as the network itself, facilitating an offline internet that tries to compensate for limited and expensive access to the WWW.

We explore the above elements by emphasizing the articulation work performed in maintaining EP. Strauss defines articulation work as "first, the meshing of the often numerous tasks, clusters of tasks, and segments of the total arc. Second, the meshing of efforts of various unit-workers (individuals, departments, etc.). Third, the meshing of actors with their various types of work and implicated tasks" [43]. Building on Strauss' definition, Suchman describes articulation work as the continuous efforts required to bring together discontinuous elements—of organizations, professional practices, and technologies—into working configurations [44]. Our findings detail how articulation work is made up of the small and everyday tasks or non-instrumental practices typically taken for granted, even as they contribute towards the sustenance of larger systems or infrastructures [29]. Thus we employ articulation work as an analytical device to render visible the human

infrastructure sustaining and growing the offline internet we study. Exploring the tasks involved in procuring, organizing, distributing, customizing, and sharing EP, we aim to provide a rich understanding of the human infrastructure of EP and how the foundation of this system is *"constituted by the pattern of relationships of people, through various networks and social engagements"* [38].

METHODS

Data Collection

Although EP's distribution network spans the entire country, our research was focused on Cuba's capital city of Havana, where EP originates every week. Our data comes from fieldwork conducted in Havana across five phases (between December 2015 and July 2017) by Michaelanne, David, and Josiah. In sum, we conducted semi-structured interviews with 53 individuals—23 identified as females and 30 identified as males, ranging in age from 19 to 74 years old (see Table 1). All participants were born, raised, and are living in Cuba. We relied on referrals from contacts made during previous travels to Cuba and used purposeful, snowball sampling to recruit initial participants who referred us to additional contacts [40]. We continued our fieldwork until we found that our data had reached the point of saturation [17]. All interviews were conducted in Spanish at locations of the participants' choosing and lasted from 30 to 90 minutes. During these interviews, we asked participants about their experiences as both distributors and/or consumers of EP and their motivations for purchasing, sharing, and consuming content. We also asked about the activities they undertook as they engaged with the network, the content, and each other. Although we did not compensate participants, when interviewing store-owners and distributors, we did purchase components of EP to better understand the tasks undertaken for the curation and distribution of EP.

In addition to interviews, we conducted participant observation by visiting, observing, and engaging in the places where EP is created, shared, and sold. We followed Paqueteros, visited EP stores, and purchased different components of EP. While waiting for our purchased content to download, we observed the ways in which various actors engaged with EP. We developed relationships with our participants and often re-visited EP stores multiple times, spending at least an hour in each EP store. We also accompanied participants as they bought content from Paqueteros, shared content with friends, and/or appropriated this content in various ways. Throughout our fieldwork, we engaged with EP as La Gente—buying content, recommending content to others, sharing content, asking for requests, and searching for technical workarounds when our own equipment did not work.

Data Analysis

We conducted inductive, iterative, thematic analysis on the interview and observation data collected by the first three authors [6]. After an initial coding pass through our consolidated findings, which were in the form of translated transcripts, we identified themes related to research engaging human infrastructures [24, 37]. We re-coded the data with these themes in mind and identified the articulation work [43, 44] involved in supporting the human infrastructure of EP, focusing on the

Table 1. Participants by Group

Group	Participants (53)
Los Maestros	1 male
Los Paqueteros	5 females, 11 males
La Gente	18 females, 18 males

various efforts made by participants throughout the process of engaging with this system. Our entire research team was engaged through the iterative processes of data collection and analysis, contributing diverse combinations of backgrounds and expertise to this project. Michaelanne is an ethnographer of Cuban descent who has conducted extensive qualitative research in Cuba and other resource-constrained communities in the U.S. and Latin America. David is an ethnographer who has studied low-access communities in Brazil, Cuba, India, and the U.S. Josiah is a researcher of Cuban descent who has experience working with low-resource communities in the Philippines, Bangladesh, and the U.S. Amy contributes her expertise in social computing and sociotechnical systems research. Neha is an ethnographer who is experienced in studying social media and internet access in underserved contexts.

FINDINGS

We now present our findings to highlight the *human infrastructure* of EP [37, 24], drawing attention to the intricate labor (or *articulation work* [43, 44]) involved in sustaining and growing this information network on a daily basis. We organize our findings to focus on the contributions of the key actors in EP. These are *Los Maestros* (the masters), *Los Paqueteros* (the packagers), and *La Gente* (the people). Below we describe each of their roles and perspectives, also detailing the labor they provide for the functioning of EP.

Los Maestros

On an evening in December 2015, Juanito[2], a 27-year-old casually dressed in board shorts and no shirt, invited us into his apartment in Centro Havana. At first glance, his home appeared to be a typical Havana apartment, but a quick tour revealed a small, central room equipped with three AMD A4-series desktops with 21-inch Toshiba screens, one 24-inch Zenith television, and numerous hard drives and flash drives. We were standing in the studio of one of the Maestros who compile the original editions of EP. Juanito manages his studio along with Marcos, his 24-year-old business partner, and Paola, his 22-year-old girlfriend. The team combines a variety of tasks and resources to compile the one TB of digital data required to release EP to the Cuban public on a weekly basis.

Compiling EP

Each week, a new EP is released to the Cuban people by Los Maestros, a select group of individuals who operate their own collectives or studios[3]. Los Maestros and their studios organize the tasks of acquiring, compiling, and organizing the original one TB packages.

> *"I have different people bringing sections to me...I have one person downloading movies, another one taking care*

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[2]All names have been changed for anonymity.

[3]Our research revealed that there are only three studios or lead maestros in existence; we were able to gain access to one of these three.

of music, and another one bringing TV shows. I organize the content, make sure there's no pornography or anti-government stuff, and put everything in [EP]...and pass it on to Los Paqueteros."—Juanito (M, 27)

To acquire this content, Juanito draws from a limited pool of people who have varying degrees of internet access, such as dial-up connections at home, WiFi hotspots, and/or faster connections at university and government agencies. Although access to this type of information has been limited in the past, Los Maestros undertake small and large tasks to navigate various constraints so that millions of people are able to take advantage of the access that others have. In Juanito's studio, each member moves across various spaces that they have access to and knowledge of in order to acquire content. For example, Paola's job is to study the TV schedule and tell Juanito when a specific show is on so that he can digitize it. Juanito has a satellite dish installed in a fake water tower on his roof, which allows him to access this content at home and thereby stay ahead of the competition (the other Maestros).

Creating EP

Los Maestros' work goes beyond curating downloaded content and passing it along to Los Paqueteros; Maestros also produce and create new content for EP, mainly in the form of classifieds, journalistic pieces, and promotion of local content. Los Maestros do the work of advertisers and designers, promoting local businesses around Havana by designing digital posters, converting them into PDFs, and adding them to specific folders in EP (usually selected based on the audience they are trying to reach). Maestros also undertake the tasks of designing their own promotional flyers to advertise their services to Los Paqueteros and La Gente. They also work with various content creators in order to have their (the creators') media distributed on EP. In this role, Maestros serve as promoters for local artists and have also become local celebrities themselves:

> *"[The promoters] have a reputation...there's The Thunder, there's Abdel La Esencia, there are two or three of them that are the most famous. Then the artists themselves go and get promoted by them, because they know they are the ones who can distribute their music better."*
> *—Osmany (M, 29)*

Maestros who act as promoters search for new artists to add to EP. These Maestros design the album covers, which typically contain their promoter name (*e.g.,* The Thunder), email address, and phone number so that individuals who wish to promote their work on EP can get in touch. When we downloaded music from local musicians who were being promoted through EP, we found that the album art included pictures of the Maestro who was promoting the music, not of the artists or the band. These promoters in the network serve as a new way for artists to launch their careers and access their fan base. During the summer of 2017, Michaelanne and Josiah attended the beach-front concert of a local, reggaeton artist who was made popular by EP. In fact, this artist was recommended to us several times by participants, who said that he was currently the most popular artist in Havana because of EP. As a result, Los Maestros make sure not only to include his music in EP, but also social media updates from him, including YouTube videos, Facebook live videos, and Twitter updates.

Los Maestros monitor the most popular artists on social media and download any new content that comes out weekly. They also put their signature "marks" or logos on the videos and screenshots so that others can assign credit appropriately.

While this process of creating and gathering content may appear to be top-down, EP's network is comprised of multiple overlapping matrices and the product is by no means a "one-size-fits-all." The articulation work involved here is ongoing and active as actors mesh together various tasks and resources. Many individuals perform the labor of adding their content to EP along the way and engaging with other individuals in EP's human network. As described below, content procurement does not cease when leaving the studios. With the evolution and increasing penetration of EP, content has begun to enter it at various points across the distribution network. Although there are main producers of content and there is a lot of overlap between versions, EP looks different depending on who is distributing it.

Maestros decide on the content that goes into EP based on content that has been popular in the past, what is popular online, and user requests delivered by Paqueteros. Each week Juanito, Paola, and Marcos (as well as other individuals who help them acquire content) deliver the digital parts of EP to Juanito's studio by hand via USB drives, CDs, DVDs, and hard drives. As Juanito mentioned above, Maestros "clean" the content they acquire by digitally editing it to remove illegal or controversial content, including pornography and content that may be deemed anti-government. Moreover, the content is edited to remove commercials and, at times, add subtitles. The Maestros then label the digital files and organize them in categories according to the media.

The Maestros and their studios serve as hubs within EP, compiling digital information that is later distributed throughout the network. Los Maestros rarely sell directly to consumers; instead, they sell the digital content to individuals called *Paqueteros*. Once the weekly EP is ready for distribution, individuals from the various studios physically deliver several external hard drives to Paqueteros across the country. For example, each week, Marcos flies from Havana to Santiago de Cuba, the second largest city in Cuba, to transport EP to Los Paqueteros in that part of the country.

Los Paqueteros
On a narrow street in Havana Vieja, we visited a bottom-floor apartment with a blinking, rainbow-colored sign that read "OPEN." Inside, the front room of this house had been converted into a shop with a desk, couch, and a wall full of DVDs packaged in colorful paper envelopes. Ricardo, one of the shop owners, sat behind the desk scrolling through digital files on his Dell desktop computer as a middle-aged woman, Aileen, looked on. *"Copy me something good,"* she told him, *"Whatever you recommend."* Ricardo quickly navigated through several folders on his screen until he got to the soap opera section. *"I'm going to put a soap opera on here for you that you're going to like, just the first season,"* he told her. *"If you don't, just bring it back and we'll find you something else."* Aileen pulled out a USB stick from her purse and handed it to Ricardo who got up from his chair to plug the USB into the computer tower on the floor behind his PC. As he began to

copy the files onto the USB, Aileen told him that she had been having trouble with her phone. Ricardo told her to come back later in the day and that he would help her install the latest software update that just came out in the week's EP. *"See,"* he told us, *"I not only sell them content, I help people in my community with everything."* These Paqueteros remind us of the media distributors that Kumar and Rangaswamy found in urban India [21]; the main distinction is that the requests we saw here were more sophisticated.

Los Maestros' studios sell EP for about 5 CUC to Los Paqueteros, who then distribute it across Cuba and sell it directly to stores and individuals. Through a variety of seemingly small and large tasks, the labors of Los Paqueteros fulfill a crucial role in stitching together the human infrastructure of EP. Moving across the large web of individuals, Paqueteros piece together various connections between Los Maestros, other Paqueteros, and La Gente through articulation work. Often, individuals who travel the country as part of their job (like bus and taxi drivers) serve as *mulas* (mules) and transport EP to multiple distributors across Cuba's twelve provinces. In Havana, we were told that Los Paqueteros used to deliver directly to EP stores as well as individual homes. Once EP became more structured and pervasive, Paqueteros began opening physical stores in Havana, a practice that has proliferated further more recently. Below we describe how individual Paqueteros distribute and curate EP.

Distributing EP
Carla wakes up each morning at 7am, grabs her freshly baked guava pies, and walks through the streets of Old Havana to sell them. This routine is only slightly different on Mondays, when she stops at Bendito's studio to purchase EP and bring it home, where her husband, a DVD store owner, prepares USB flash drives containing EP, which Carla then distributes to her guava pie customers:

> *"I bring the [flash drive] with me. As I walk through these streets and do my normal job, I make some extra money selling EP. I basically sell it to my customers and friends. They already know me, and other Paqueteros don't come here, since it's already covered by me. There's a market base for everyone in Havana."—Carla (F, 26)*

Bruno makes a living riding his (unlicensed) taxi bike in Centro Havana every afternoon, giving unofficial city tours to foreign tourists. He also takes advantage of the mobility of his job to bring EP to restaurant owners when he drops tourists off at these establishments. Bruno undertakes the tasks involved in procuring, compiling, and delivering personalized EP content for his clients:

> *"[Restaurant owners] want the EP with just music videos. Like, they want to plug this [flash drive] into their TV and have the music videos playing for them. They don't want to play with folders, settings or have to go through a computer. They want it simple, and that's how I deliver to them."—Bruno (M, 18)*

Bruno's account is indicative of the reasons EP became popular. Since not everyone in Cuba has a computer at home, people prefer to plug a USB flash drive into DVD players and stereos (that more people have access to) and simply browse

the content. To facilitate this, Paqueteros tailor the delivery apparatus to the preferences and constraints of their clients, adding another layer of personalization to the weekly internet.

Curating EP

Although Los Paqueteros may seem to just be a part of this infrastructure that transfers information from Los Maestros to La Gente, they often took charge of customizing the versions of EP that they sold and shared with others. Due to the work they undertake, Los Paqueteros curate a type of personalized internet for people in Havana, combining multiple sources to create their own versions of EP based on their technical capabilities, their customers' preferences, the part of town they sell to, and their own personal tastes and values. Gabriella negotiates between her clients' preferences, social connections, and technical skills to piece together digital content from multiple sources:

> *"[La Gente] ask for all kinds of content, and I try to please them as much as I can. I go 'hunting' for shows and movies they want to watch. I talk to different Paqueteros and Maestros in order to find the right stuff... Once, I collected several [digital] ads from different restaurants because a costumer, who had just started renting out rooms, wanted to recommend places to eat to his guests."—Gabriela (F, 29)*

The quality of content that Paqueteros provide also depends on the equipment they have. This is often an issue of storage space. Although Maestros and Paqueteros have to delete the majority of EP each week to make space for the next version, they often keep copies of the most popular content, especially if it is part of a series that comes out weekly. Luis has only been working as a Paquetero for four months. He turned his small, one-bedroom apartment into an EP store so he could work from home and take care of his infant daughter. He cannot afford to purchase more server space, which affects the type of service he provides for his customers:

> *"There are different [EPs]. There are people who have a better business, they have more storage space so they already have a lot of movies, lots of series. They are able to create EP themselves, there are people who can put it together and there are people who do not...But somewhere you will always hear, 'this [content] came in his [EP] but not in mine'."—Luis (M, 22)*

Some Paqueteros mentioned that, due to their own limited skills, they did not tinker with EP or add content beyond what came to them from their Maestro. Yuniel is a former teacher who works at an EP store that is run out of a small, central room in the bottom floor of his boss's apartment. He shared:

> *"We are the receivers of the information but we do not configure it. In fact, it's not my area. If I knew how to work with computers, I would edit it, but, I'm not too excited about that thing."—Yuniel (M, 30)*

Although Yuniel does not configure information, he does undertake other tasks to personalize EP for his customers. Similarly, other Paqueteros spoke about the work they do to ensure that their customers acquire the types of content they value. Ricardo and Teresa are neighbors who opened an EP store in

Old Havana in early 2017. Sometimes, their customers request content that is not in their version of the EP. In those cases, Ricardo speaks to their Paquetero and requests that certain types of content be included in future. However, the Maestros and Paqueteros do not always include requested content (particularly if there is not a large demand). Ricardo often manually supplements his versions of EP with content that he thinks will be meaningful to his customers. This involves searching for content that people might request by "*knowing [his] clientèle.*" Sometimes, he walks around the city visiting other EP stores, searching for content that they may have acquired from other Maestros or Paqueteros.

Paqueteros also clean or censor EP, most often to ensure that their content is high-quality or that it does not contain overtly anti-government messages. At other times, censoring is due to personal beliefs or beliefs of customers. For example, Renier has been selling EP for six years and the majority of his 100 clients are religious. Renier shared that his religious views impact the way in which he compiles his version of EP:

> *"Sometimes I clean EP when it arrives. That is, I remove what I consider to be obscene things that are against the Christian theme. [My] EP comes from me and I do not like to distribute something with content that is not good. If there is something I do not approve of, I try to eliminate that section. It's like censoring."—Renier (M, 35)*

Renier's customers, therefore, receive an offline internet that is censored based on his sensitivities. Renier's view is that he censors his material as an extra service for customers and, if they do not approve, they can find a different Paquetero with a different EP.

Los Paqueteros tailor the content and delivery method of EP based on their customers' preferences, budget, and technical resources. For example, Ricardo charges less for his content than other Paqueteros because he believes that his clients do not earn as much as the others' and can not afford high rates. Additionally, he makes sure his less technologically-savvy customers know how to download and update their phone software (and often does this for no extra charge). When we asked him why he helps people in these ways, Ricardo replied, "*The only way people know about these things is in EP. There is no internet. I bring it to them.*"

Los Paqueteros negotiate with customers, creating personalized EPs for individuals and groups. We interviewed Yuniel in his EP store and observed him as he patiently searched for yet another movie for a 10 year-old customer who was trying to find one that his friends had not yet watched. "*This is the third time you've been in today,*" Yuniel told the boy, "*but don't worry, if you don't like that movie, come back and we'll find one for you.*" Yuniel told us that he would not charge the boy extra, "*he only has enough for one movie so I'll work with him to find the one that suits him, even if he has to download a few different ones.*"

Paqueteros are also involved in the job of producing content through the insertion of hyper-local ads as well as the promotion of local artists. Moises told us that, while the Maestros charge for promotion, he does not:

"I do not charge anything for promotion. . . not to those who start now. Those who start here are not charged anything. If they cannot go directly to [Los Maestros], they reach us here."—Moises (M, 46)

Moises said that he viewed this as a service he could provide to members of his local community to support them in their endeavors. He added that he was going to continue working to improve EP because, *"it's actually one of the only ways the people today can see things that they do not have access to."* âĽŽ EP's influence is clearly visible across Havana as La Gente (the people) engage with it on a regular basis:

"EP is important for us because this is the way that people are able to entertain themselves. They can see shows, soap operas, documentaries, among other things. They can also learn about the news occurring in the rest of the world."—Camilo (M, 26)

In addition to being the main consumers of content, La Gente (or the people) are also critical members of the human infrastructure as they engage with this EP and, thereby, other users through their own processes of articulation work. In this section, we describe how La Gente appropriate, produce, and share EP content and the tasks involved.

Appropriating EP

When individuals want to acquire content from EP, they purchase it from a Paquetero at a store or get it delivered to their home. Additionally, people often share content with one another for free. While foreign content (like TV shows, movies, music, and sports) is popular, more content has begun to emerge that originates in Cuba. EP is not simply access to foreign content, as Ricardo told us:

"Cuban films are sold a lot. Because here they do not see it until long after they are made, until they do the premiere. However, people now have access to these movies here, on EP."—Ricardo (M, 53)

EP fills an important gap by facilitating an offline internet through which individuals can share content originating from Cuba, which was not possible previously. While prior work has primarily examined the leisure-driven engagements with informal media-sharing [35, 20], participants undertake various tasks to acquire content that was not leisure-based. Zamira visits multiple Paqueteros and asks friends in order to find educational content that is appropriate for her five year-old granddaughter. She also searches for *"items from Discovery,"* a phrase that alludes to content from the Discovery Channel but has evolved to mean any documentary film:

"It's important for people to have a larger view of what is in the world. I love watching Los Discovery because it allows me to see what life is like for people all over the world. This is important for us here."—Zamira (F, 74)

Like Zamira, several participants spoke to us about the importance of having content that *"expanded their views,"* speaking to the value of information access driving this system. EP acts as more of an information medium than purely an entertainment service.

Much of the motivation to engage with EP comes from the fact that it is the main (and often only) source of information that comes from the WWW. For example, Javier said that EP is the only way that he and others can consume social media content, including informative YouTube videos adding that, *"all the information is on social networks through EP."* As individuals search through EP, they mesh together various pieces of information to accomplish tasks that are important to them and create a version of the internet that suits their needs. For example, participants spoke to us about using content from EP to enhance their work. Alexis works as both an artist and a pastor. When Michaelanne and Josiah attended one of his sermons in Havana, he showed a multimedia example to the audience that he had created using digital editing software. Alexis explained that he relies on EP for technology and multimedia tutorial videos in order to stay up to date with the latest in technology, but also to learn how to use technology he already owns. He also said that EP helps him communicate with his congregation by finding shared content that people in his community are familiar with.

Not only does the content in EP help in connecting to others and learning new skills, participants stressed the importance of engaging with EP to do any kind of buying, selling, or trading in Havana. For example, EP enables Cubans to interact with *Revolico*, the most popular classified website in Cuba, and—according to participants—one of the only ways for individuals to buy and sell items, find jobs, and advertise their businesses. Each week, Los Maestros download the most recent version of the entire *Revolico* website and include this in EP. Luis pulled up the most recent PDFs of Revolico's webpages on his computer and walked us through the content:

"Everything is sold and bought on [Revolico EP]. From computers, cell phones, players, cameras, videos, air conditioners, everything. Here are the services that are provided. Buying and selling houses, trades, rentals, jobs, resumes."　—Luis (M, 22)

Since the majority of Cubans do not have affordable internet access, EP is the primary way for individuals to engage with *Revolico*. La Gente who wish to advertise in *Revolico* write up an ad and ask friends with internet access to post for them online. La Gente can then get access to the offline copies of the webpages on EP and contact the original posters over the phone. Individuals thus interact with the offline internet that EP facilitates. The value of being able to buy, sell, trade, and look for jobs through EP was repeated several times throughout our fieldwork by participants across the three groups.

Sharing EP

Although EP stores and distributors are not difficult to find in Cuba, and EP content is considered affordable by participants, many participants did not purchase content themselves. Instead, they relied on intermediaries to provide them with various pieces of content from EP. Yulia, a 19 year-old college student, told us that, *"everyone has to rely on everyone else."* Individuals who purchase EP directly from stores or distributors often share content with their friends. Some participants have developed their own, informal distribution methods. Osmany has developed a collective strategy with his colleagues to maximize the content they receive from EP:

"At work, we have 4 or 5 computers where we copy EP weekly. Right now I have EP available from a month or so ago, because it's on that computer. I can copy what came out in EP this week or what came out in EP a month ago connecting to the other. Among the workers, we collect 15 pesos a month and distribute EP through the work network."—Osmany (M, 29)

Human components are central to the creation and maintenance of EP in Havana, as individuals engage with the sociotechnical system and one another to accomplish their information-seeking goals. Juan is a 24-year-old mechanic who receives EP from his friend, a Paquetero. This friend drops off an external hard drive with Juan every Thursday night, Juan downloads the entire EP, and the friend picks up the drive from Juan the next morning. He says that for people who are friends with distributors and *"in relationships of mutual trust,"* it is easier to procure EP. Juan does not need to leave his house nor own an external hard drive, since his friend drops the drive off every Thursday. Similarly, Yulia relies on her brother and young nephew to purchase content and share it with her. During our fieldwork, we regularly saw children in EP stores buying content for their siblings, parents, grandparents, and friends.

Publishing to EP
La Gente are also active in curating or creating content for EP, thereby reshaping the offline internet being delivered in Cuba. For example, EP is viewed as an alternative to the state-owned press, allowing local journalists to turn to EP for publishing their content within Cuba, something that was previously not possible. We met with Maria Joaquina, a journalist and column writer for *Vistar Magazine*. This online magazine was designed for Cubans living outside of Cuba since the majority of people inside the country do not have a way to access this content online. However, as a result of EP, Maria said, the magazine is able to cater to audiences living in Cuba:

"EP is the most efficient and cost-effective way for us to publish our content. It affords new paths and opportunities for those who work with journalism. Before, the only opportunity was to work for the Government...now EP provides a different venue."—Maria (F, 26)

Our participants said that EP was a new avenue for this kind of information dissemination. Similar to how Maestros and Paqueteros choose content for EP and thereby have a say in what others consume, La Gente also influence the type of information that is available to other users, most often through advertisements or self-promotion. Juliana paid 1 CUC per week to have her restaurant's flyer designed at the studio and distributed on EP:

"I started a new service at my business. I now deliver food in Centro and Old Havana and needed to promote the new service and the phone number. Food sales have increased substantially."—Juliana (F, 43)

Although 1 CUC per week is not inexpensive (on average, it amounts to a day's wage), EP is seen as the most effective network through which to advertise to local audiences. For example, Juan, the mechanic, relies exclusively on Revolico webpages that are downloaded and published in EP to find the car parts he needs for his auto-restoration business. He told us that, without EP, he would not be able to run his business and would have to pick up other side jobs.

Some of the ways in which La Gente engage with the content are influenced by the large amount of content that comes in EP. Participants said that going through all the content each week could be overwhelming. For example, although Javier occasionally purchases parts of EP himself, he prefers to get it from one of his friends who buys the entire EP and sets aside content that Javier likes before dropping off her external hard-drive at his apartment. Javier said that he prefers this process because it is a lot of information to go through and his friend, *"already knows what [he] watches"*. Participants spoke about EP as a type of personalized internet. Similarly, Alexis does not buy EP in its entirety. Instead, he copies parts of EP from his neighbor, who buys select parts from a distributor.

"I don't have access to more [than what my neighbor buys]. I don't want to have it either because sometimes it's so much information that I lose my mind. I'd rather see what my friend has already selected. I trust his taste."—Alexis (M, 34)

Alexis said he feels more connected with the content because he is watching the same content as his neighbor. He said it is a luxury that his neighbor chooses his content because he does not have to go through the work of searching for relevant, meaningful content himself. Alexis also pulls out content from his EP that he thinks his wife and daughter will like. His daughter gets content from friends and, in turn, shares it with her parents. La Gente share content from EP that they find meaningful while also creating opportunities to collectively engage with that content. Javier said that he preferred to have content selected for him on EP. As mentioned previously, Los Maestros include social media content from popular celebrities in EP. Javier said he liked not having to search for this content himself because, *"it's a little stressful to have to search for what you want to see."* Javier said that having content preselected from the internet was one of EP's positive feature:

"The advantage we have is that it comes in EP [instead of having to search for it online]. It's a lot of information. If you don't like it, you don't have to see it. Even if they choose it for you."—Javier (M, 28)

While relying on someone to choose your content may appear limiting, participants often spoke positively regarding that moderated aspect of EP, drawing parallels to the WWW. As many other individuals did as well, Alexis compared EP directly to the internet:

"EP is like the internet. The internet is not a bad thing...There are people who misuse it, but it's not a bad thing...one good thing is that our internet [EP] is filtered; you will not find negative content. Like pornography. Bad things. Because the people in charge of distributing EP, they select what to put."—Alexis (M, 34)

Participants referred to EP as a version of the internet that was personalized for them and provided them with opportunities for different kinds of engagement. This human element of EP not only allows it to function, the process that individuals

go through as they engage with this system also serves to reinforce connections, given the extent to which EP relies on social ties to operate.

DISCUSSION

Sambasivan and Smyth proposed the human infrastructure lens to draw attention to the sociotechnical ties and linkages that constitute this infrastructure [37], adding, *"The lens of human infrastructure opens us up to the existing articulation work in ICT4D contexts."* Our research makes visible the human infrastructure of EP—a network distributed across Cuba that packages and brings digital information and media to its people, just like the internet. We extend Sambasivan and Smyth's human infrastructure lens by emphasizing the community-building and long-term information infrastructure-building efforts involved in EP, foregrounded through our focus on the articulation work performed by key EP stakeholders. Our findings highlighted, in particular, how articulation work plays a central role in sustaining and growing EP, offering a unique version of the internet where it would otherwise not exist. From Juanito's building and maintaining a fake water tower to be able to download content from a satellite dish and Paola's sitting in front of the television watching satellite TV so she can tell Juanito when a particular show is on for him to digitize it, there are small and large tasks the humans of EP engage in, reconciling multiple assumptions and constraints to sustain a thriving, expansive information network [15]. Below, we detail salient aspects of EP that are foregrounded when we focus on its human infrastructure and the articulation work that sustains and grows it. In these details, EP emerges as a provocative example of an information system that challenges our notions of what an (or *the)* internet "should" look like.

A Personalized, Negotiated Internet

The human infrastructure of EP mobilizes a personalized kind of internet for its consumers. Our participants described how they customized EP for others and how they preferred to engage with EP so it was customized for them. The fact that EP is held together by human links also means that the transactions are varied, non-standardized, and generally unpredictable. For example, Yuniel considers his customers' price budget and age as he repeatedly helps him find the right movie for him and his friends, while only charging him for one. When interacting with La Gente, Yuniel negotiates prices, content, and delivery methods, among other factors, to provide an experience that suits each person's needs. EP is thus adaptive, ongoing, and open-ended, and thereby nondeterministic. This unique, negotiated nature of EP differentiates it from a primarily hardwired, technological infrastructure.

Even as it strives to give people what they desire, personalization tests the notions of internet neutrality, particularly when we consider the moderation that occurs throughout EP. A human process of selecting content means that certain individuals are in a position to decide what others have access to. For example, Camilo gets frustrated when he requests specific content that exists online but his Paquetero is not able to find it for him. Or, more explicitly, Renier censors his EP based on his religious beliefs and (what he assumes to be) the religious beliefs of his customers. Many participants appreciated these practices, speaking about how there was too much information

in each EP for them to go through it all. Therefore, they viewed the sheer amount of content as limiting, preferring to get the partial content on EP that had been selected by someone else. Javier said that there was too much information for him to go through each week and, therefore, he relied on his friend to both acquire and assort the content she thought he would like. A technical limitation (the capacity of commonly available USB drives) has catalyzed the emergence of human-mediated personalization. Even as participants value the personalized and collective elements that the human infrastructure of EP supports, they must depend on the choices that others make for them.

The case of EP also raises questions around what might be lost if the work that its actors are doing was automated, partially or entirely—a question that is increasingly concerning a large and growing community within HCI [3]. As systems move towards becoming more and more automated, our study illuminates aspects of the human infrastructure (such as personalization) that are not always replaceable by technology. This visibility, we argue, is just as important in places where internet access is not constrained, such as in the case of Mechanical Turkers and Gig Workers, whose contributions are frequently made invisible [16, 18]. Through this enhanced visibility, we see that actors of EP not only engage with the material, tangible elements of the network, but are in constant negotiations with personal preferences and legal boundaries. These negotiations are continually feeding into a system that remains responsive and adaptive to a variety of use cases.

Although there are assets that the human infrastructure lens highlights, there are also limitations that it foregrounds. For example, the lack of automation may facilitate personalization, but this also means that individuals have to undertake a lot of work to support the network. For example, Renier shared that he is dependent on the content the Maestros and other Paqueteros choose to give him. If a Maestro like Juanito does not undertake the work of maintaining his satellite connection, the shows that he distributes across the country would not appear in the EP. A focus on the human infrastructure underscores the fragility of EP, demonstrating how dependent individuals are upon one another, and how dependent the system as a whole is on multiple human actors. Technological limitations, such as the lack of central servers hosting EP's content, further imply that most participants have to delete the entire EP each week to make space on their servers for the next week's version, thereby limiting the amount of content that is available at any one time.

An Entertaining, Informative Internet

In essence, what we see in EP is a replication of the media-sharing practices that prior ICTD research has highlighted. Just as the media distributors in New Delhi [21] offer content for financial gain or social recognition, so do the Paqueteros. Entertainment remains a key motivation for acquiring and engaging with new kinds of content for the consumers in Bangalore [42] just as it is for La Gente. Like the male Indian youth who wish to be better connected to the rest of the world through Facebook [20], so does Zamira who seeks out documentaries from other countries because it makes her feel *"more connected to the world."* What is unique to the Cuban

case, however, is that these media-sharing practices are not limited to certain users who are on the margins. They are far more pervasive than prior work highlights. Almost all Cubans' information needs are targeted and met by EP, not merely those of users on the margins. The human infrastructure that consumes and distributes EP includes Cuban citizens from different parts of the Havana, with different jobs, ages, and skills. This highlights the unique sociopolitical conditions that EP thrives in, which have resulted in a prevalence of information scarcity and resource constraint. There is no other, superior, more expensive information network available to these Cubans (although the WiFi hotspots do provide a meager alternative), as is true in Bangalore and New Delhi.

Additionally, the practices that we see in the case of EP are not limited to the dissemination and consumption of entertainment media alone. All kinds of information needs are targeted and met by EP, not just those that are entertainment-related (although they may have come first). This results in an engagement that touches many different aspects of human life. Several participants spoke about the importance of EP for acquiring educational information. Alexis uses tutorial videos to help him improve his multimedia abilities and, thereby, his artwork and the number of pieces he sells. Since EP is the main mechanism for individuals to engage with online content (albeit in offline form), it connects users with critical resources. As mentioned in the findings, EP is the primary way for individuals in Cuba to buy, sell, or trade goods, find employment, and learn new skills relevant to their jobs, like in the case of Juan, the mechanic who finds and sells auto parts exclusively through EP via offline versions of Revolico webpages, which allows him to sustain his own business.

A Relevant, Participatory Internet
Our findings reveal how the human infrastructure of EP facilitates a relevant, participatory internet. Many ICTD initiatives have focused on constructing information networks that are voice-based and/or local (*e.g.,* [26, 32, 45]), recognizing that the WWW may certainly have a draw, but not be high on relevance. With EP, we see a thriving example of an established, pervasive information network that relies significantly on locally relevant content. This forces us to question what value might be added through access to a WWW that largely represents a world far removed. In addition to content, delivery mechanisms of EP are also locally relevant. For example, access to the WWW in Cuba is prohibitively expensive whereas EP is affordable for all, especially with price adjustments for certain individuals/groups. Moreover, since EP's content is not openly in opposition to the Cuban government, it is viewed as a "safer" alternative than the WWW. For example, EP is regularly "cleaned" by Maestros and Paqueteros to remove content that the government disapproves of.

In addition to EP's content and delivery methods being relevant for local consumption, it also contains locally sourced content. Los Maestros and Los Paqueteros recruit local talent and feature their work in EP. La Gente buy, sell, and trade items through EP in addition to promoting services and businesses. Consumers of EP do not engage with content passively; they also produce content that finds its way back into EP, like Maria who used EP to publish a digital version of her local

magazine, offering an alternative to government-run media. Such engagements make EP a mèlange of local and global content, emphasizing the participatory dimension of this internet. Further, unlike other examples of internet access for resource-constrained regions (such as Facebook's zero-rated services [4, 14]) content in EP is not limited to what one company or ISP provides.

There are forces limiting, however, what EP might include. Los Maestros, for example, act as gatekeepers; although it is in their best interest to provide their clientèle with content they desire, they make the final decision about what is included in the (original) EP every week. Throughout EP's network, various individuals exercise control over what information is passed along (like Renier censoring his version of EP). Moreover, adding content to EP is easier for those who can pay for advertisements or promotions (or are well connected to Paqueteros or Maestros). As with all sociotechnical systems, there are power structures at play within EP—some have more control over content than others—as well as the power structures acting upon it. For example, the content in EP is not only determined by what people desire, but also by government regulations (such as no pornography or anti-government talk). Thus, while EP is relevant and participatory in ways that benefit the Cuban people, it does remain subject to the politics of information.

CONCLUSION
We presented a qualitative inquiry of the El Paquete information-sharing ecosystem in Havana, Cuba, and how it acts as an internet for the majority of Cubans. Our research contributes to scholarship in HCI by emphasizing the key human infrastructural elements that support the sustenance and growth of an expansive information network. For the field of CSCW, we strengthen prior research on the human infrastructure lens through our in-depth engagement with the articulation work that EP's operation relies on. These are the small and large everyday tasks that are not always visible in information networks but successfully make the EP more human-centered. Finally, for the field of ICTD, we extend a rich body of research on media-sharing practices and offline information networks with our case study of EP, as we highlight how its actors rely on it for leisure and livelihood, both generating and consuming locally relevant content.

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