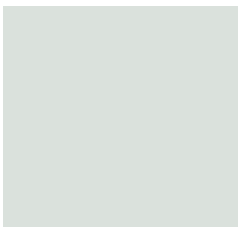


Cuba's Parallel Worlds: Digital Media Crosses the Divide

BY ANNE NELSON

August 2016





ABOUT CIMA

The **Center for International Media Assistance (CIMA)**, at the National Endowment for Democracy, works to strengthen the support, raise the visibility, and improve the effectiveness of independent media development throughout the world. The center provides information, builds networks, conducts research, and highlights the indispensable role independent media play in the creation and development of sustainable democracies. An important aspect of CIMA's work is to research ways to attract additional U.S. private sector interest in and support for international media development.

CIMA convenes working groups, discussions, and panels on a variety of topics in the field of media development and assistance. The center also issues reports and recommendations based on working group discussions and other investigations. These reports aim to provide policymakers, as well as donors and practitioners, with ideas for bolstering the effectiveness of media assistance.

Center for International Media Assistance National Endowment for Democracy

1025 F STREET, N.W., 8TH FLOOR
WASHINGTON, DC 20004
PHONE: (202) 378-9700
FAX: (202) 378-9407
EMAIL: CIMA@ned.org
URL: <http://cima.ned.org>

Mark Nelson
SENIOR DIRECTOR

ADVISORY COUNCIL FOR THE CENTER FOR INTERNATIONAL MEDIA ASSISTANCE

Esther Dyson	Craig LaMay
Stephen Fuzesi, Jr.	Caroline Little
William A. Galston	William Orme
Suzanne Garment	Dale Peskin
Ellen Hume	Adam Clayton Powell III
Jerry Hyman	Monroe E. Price
Alex S. Jones	Rep. Adam Schiff
Shanthi Kalathil	Marguerite Sullivan
Susan King	Richard Winfield

Cuba's Parallel Worlds: Digital Media Crosses the Divide

AUGUST 2016

Contents

About the Author and Methodology	1
Overview	2
Cuba's Traditional Media	5
The Fiber Optic Cable: Cuba's Big Little Bang	7
China's Role	9
Enter the Americans	10
Who Makes Cuba's Digital Policy?	13
Cuba's Hacker Culture	19
Conclusion	22
Endnotes	25

ABOUT THE AUTHOR

Anne Nelson is an internationally recognized author and academic who has published widely on the intersection of human rights, economic development, and the media. She formerly served as the director of the Committee to Protect Journalists and the international program at the Columbia School of Journalism. Nelson designed and taught the first digital media course at Columbia's School of International Affairs and has been teaching at Columbia since 1995. She consults on international media issues for the Open Society Foundations, the Rockefeller Foundation, the Knight Foundation, and BBC Media Action, among others. Nelson is a graduate of Yale University, a research scholar at Columbia's Salzman Institute for War and Peace Studies, and a member of the Council on Foreign Relations. She is the author of six previous CIMA reports.



METHODOLOGY

The gradual reopening of relations between the United States and Cuba has revealed our lack of knowledge regarding how the media, and digital media in particular, are evolving in Cuba. This report is the product of research that has taken place over the past two years, dating from author Anne Nelson's initial research trip in March 2013.¹

Over the following three years, Cuba underwent a series of dramatic and rapid changes in its media landscape and relations with the United States. In the spring of 2016 the author and her colleague Debi Spindelman from Columbia's School of International and Public Affairs (SIPA) designed a research seminar to survey the status of Cuban digital media. They oversaw a team of seven specialized students from the Masters in Public Administration in Development Practice program. Over the first part of the semester, the team conducted online research and extensive interviews with Cuba experts from the realms of academia, business, and technology. They then undertook a 10-day research trip to Cuba and spread out over the northern third of the island, traveling by public buses, decrepit taxis, and in one case, on muleback. Together, they surveyed more than 200 Cubans from all walks of life on digital media: their use, the cost structures, the workarounds, and the potential. The field research revealed that most of the information about Cuban media available online had been fragmentary, out-of-date, or erroneous.

The team, all fluent in Spanish, consisted of Mariela Machado, a Venezuelan telecommunications engineer surveying ICT infrastructure; Tricia Johnson and Laura Lehman, researching digital media in arts and culture; Emily Sylvia and Gary Verburg on agriculture; and Chiara Bercu and Ana Carolina Díaz on public health. They documented their findings on an extensive Wiki, ICT4Cuba, which was published by Columbia University and (along with numerous other sources) is cited in this report.²

The author wishes to thank MPA-DP director Glenn Denning for his support for the research seminar, as well as the many experts, both U.S. and Cuban, who shared their time and their knowledge with the author and the SIPA team. She is especially grateful to the Cuban bloggers and U.S. technology executives, who asked to be unnamed but who offered the inside story of their historic journeys.

Overview

The Cuban government's heavy-handed censorship practices are well documented, and evident in the virtual absence of independent print and broadcast journalism. Yet recently many Cubans have shown themselves remarkably well informed about the outside world, in ways that cannot be explained by their traditional media offerings.



© Kamira / Shutterstock.com

Cuba offers a new challenge to the media development community. It is a land of paradoxes, with an extremely high literacy rate and educated population, yet a constrained information ecosystem.

This newfound benefit is the result of a parallel world of digital media, supported by ingenious Cuban workarounds. Cubans are largely deprived of data plans and broadband services, through a combination of restrictive government pricing policy and low incomes. But there's been a "Cuban solution" that relies heavily on offline mobile apps to leverage the country's antiquated 2G network, and flash drives to relay content to the public. The new Cuban media is profoundly social—but its starting point is "social" in the traditional sense: conveyed through person-to-person interactions via real-life social networks of family, friends, colleagues and neighbors.

Cuba offers a new challenge to the media development community. It is a land of paradoxes, with an extremely high literacy rate and educated population, yet a constrained information ecosystem. Its population has coped with severe shortages of hardware, software, and even instructional materials, yet it has produced a hacker culture whose ingenious approaches could be helpful to other countries with low bandwidth. For the media development community, Cuba could provide lessons for how to broaden the information space in closed or authoritarian societies and in areas of Africa, Asia, and Latin America with underdeveloped electrical grids and information infrastructure.

As Cuba begins to modernize, its experience will create the next laboratory for an ostensibly changing media environment, albeit under the still watchful eye of an authoritarian government and with infrastructure increasingly supplied by China. Perhaps because of its particular conditions and history, Cuba's hacker culture has created valuable innovations of its own. Many parts of the world struggle with the technological challenges of underdeveloped and underfinanced infrastructure, especially in rural regions. The Western model assumes the availability of efficient electrical grids, up-to-date devices, 4G networks, and 24-hour broadband access.

Although Cubans live with chronic scarcity and a paucity of consumer choice, their basic needs are met, and their standard of living places them far above the world's "bottom billion." However, their innovations could benefit the "bottom billion" elsewhere in the world through their

offline apps and other “high/low tech” innovations. Media development professionals should regard the opportunity for engagement in Cuba as a two-way street.

Cuban citizens have eagerly joined the global social media conversation, but the regime continues to pursue a digital policy based on “sectoral” development, linking large-scale initiatives to specific social projects based in government ministries (i.e. education, health, etc.) As a result, Cuban digital media is developing on several parallel tracks at greatly differing paces.

There is every indication that Cuba’s media, in many respects frozen in time following the 1959 revolution, will “leapfrog” the media conventions of the late twentieth century. In the United States, telephone landlines are falling out of favor, print publications struggle to find a business models, and broadcasting seeks a more secure future. Cuba’s landlines, print culture, and broadcasting market have not only failed to advance beyond the mid-twentieth century standards, they have actually eroded. There is every possibility that the next stage of Cuba’s development will advance on digital platforms for telephony, news, and entertainment.

This possibility becomes even more intriguing when one considers the characteristics of a command economy (a status Cuba shares with China and Vietnam, among others). The U.S. free market and democratic process require technologists to mediate a complex welter of political debates, public opinion, competing business interests and government regulations. But in Cuba and its Communist counterparts, such decisions land on the desk of a single individual with the power to “flip the switch.” This suggests that once Cuba’s sputtering digital policy is defined, its execution might be relatively rapid—especially if financing can be found.

Regardless of its eventual direction, Cuba’s digital future—for both communications and information—cannot be realized without new infrastructure, and that subject will necessarily constitute an important element of this report.



There is every indication that Cuba’s media, in many respects frozen in time following the 1959 revolution, will “leapfrog” the media conventions of the late twentieth century.

FINDINGS

- 1 The Cuban government has been gradually and grudgingly improving communications infrastructure, access to technology, and price structures. Recent government measures have involved:
 - approving the construction of a fiber optic cable for international backhaul, or the part of the network that communicates with the Global Internet
 - building the “backbone” to connect the fiber optic cable’s landing point near Santiago across the island to the capital of Havana

- legalizing ownership of digital devices and personal computers
- making Wi-Fi networks and cellphones more accessible and affordable to the public.

- 2 Cuba has begun to open its doors to international companies, including major players from the U.S. tech sector. Airbnb and Verizon are two early beneficiaries of the liberalization, and Google has established a significant presence on the island. The process has been slow, erratic, and subject to Cuba's byzantine bureaucracies and stringent foreign ownership laws—but it is progressing.
- 3 Cuban communications have been advanced by Cuba's "gray market" known as *La Lucha*, which allows economic activity to function outside state control. Digital devices have been pouring into the country, where they are sold on an informal basis. The "suitcase economy" brings in foreign goods into Cuba with relatives who live abroad, and with Cubans who exploit their travel privileges to set up private distribution networks.
- 4 Cuba's new devices benefit from a vibrant hacker culture, which has created ingenious workarounds to address technological limitations. Cuban hackers have designed and shared a host of offline apps, and entrepreneurs have created business models that transcend the market limitations. These are additional functions of *La Lucha* that are neither approved nor banned by the government. As long as the apps don't cross certain political boundaries, officials choose to look the other way.
- 5 International content comes into the country in a variety of ways, most of it in violation of intellectual property laws. The biggest development in recent years is undoubtedly *El Paquete*, a weekly news and entertainment compendium distributed in a multitude of forms across Cuba. *El Paquete* has revolutionized Cubans' access to information. As another outgrowth of *La Lucha*, the Cubans describe it as neither legal nor illegal—but as "alegal."
- 6 The Cuban government's strategy of "sectoral" media development—linked to programs and ministries in education, health, etc.—presents both a limitation and an opportunity for media development.
- 7 Dissident bloggers, long the focus of international attention, still play a vital role in Cuban media but by no means the only one. New generations of Cubans are questioning the status quo on a variety of platforms and venues that are not always easily visible from the outside, and the "loyal opposition"—neither party members nor dissidents—will play an important role in the future.



© Ana Carolina Diaz

Two Cubans sharing information through their phones

Cuba's Traditional Media

Before the 1959 revolution, Cuba's communications rated among the most technologically advanced in Latin America, as measured by telephone service and television sets per capita. Cuban journalism included 58 daily newspapers of various persuasions, and an array of mass-market publications. But Cuban nationalists were critical of U.S. government influence and the heavy hand of U.S. corporations such as International Telephone & Telegraph (IT&T) in Cuban affairs.

All that changed when Fidel Castro took power. His government confiscated IT&T's holdings and imposed sweeping measures of censorship on news media, which stagnated for decades in the shadow of the Soviet Union. As other countries underwent the digital revolution of the late twentieth and early twenty-first century, Cuba remained isolated and trapped in the past.

Communication was also curtailed. For many years the Cuban government prohibited most private ownership of computers and cellphones, and the U.S. embargo blocked imports of technological hardware, software, and instructional materials. When the Soviet Union collapsed, its subsidies disappeared, leading Cuba into the so-called "Special Period" of economic collapse. The country's outdated infrastructure fell farther into disrepair.

Censored content and degrading infrastructure were not the only impediments to expression. Under the Castro regime, all Cuban communications fall under the powerful Ministry of Communications (MINCOM), which has close ties to the Cuban military. There was a brief experiment with semi-privatization with Telecom Italia in the 1990s, which the Cubans used to launch their phone company, ETECSA (Empresa de Telecomunicaciones de Cuba S.A.)³ The foreign investment was used to upgrade infrastructure, and mobile phone service was launched around the same time.

But in 2011 the government bought out Telecom Italia's stake and renationalized ETECSA. The company, now entirely government-owned, controls landlines, mobile, and Internet service. Certain sectors, including government officials and foreign businesses, receive preferential access to the Internet and broadband service.

The Cuban government has also prohibited financial mechanisms that support independent media in most markets. The constitution



The emblem of the Havana Reporters Association, defunct since the Cuban Revolution.

© Anne Nelson



There is next to no commercial advertising in Cuba—whether print, broadcast, or billboard. Some advertising has crept into Cuba through the backdoor of tourism; even state-run hotels and restaurants compete to attract customers, and the new deluge of foreign tourists offers the best hope for badly needed foreign exchange.

proscribes commercial advertising (or “the use of the media to promote capitalism”).⁴ There is next to no commercial advertising in Cuba—whether print, broadcast, or billboard. Some advertising has crept into Cuba through the backdoor of tourism; even state-run hotels and restaurants compete to attract customers, and the new deluge of foreign tourists offers the best hope for badly needed foreign exchange. New online publications such as *lahabana.com* have tentatively promoted businesses alongside tourist attractions. But otherwise, advertising is limited to signage on storefronts and faded posters hung in down-at-heel shopping outlets such as Harris Brothers (none of which offers a revenue stream for journalism). Nor do subscriptions offer much hope; the cash-strapped Cuban public has little income to offer. It is true that these journalism business models have fallen into crisis in democratic countries as well, but Cuba also limits most of the remedial measures they seek, whether from European aid agencies or private philanthropies.

At first glance, contemporary Cuba comes shockingly close to a journalism-free zone. As of early 2016, Havana’s gleaming new airport lacked newsstands carrying Cuban or foreign press. The leading bookstores display textbooks, battered pre-revolutionary titles, foreign backpackers’ detritus, and a few contemporary titles, most of them glorifying the Cuban Revolution and the war in Angola.

The island’s newspapers offer ministry projections for ever-record harvests and photos of ribbon-cutting ceremonies, but even the most basic local news, such as crime and accident reports, goes missing. Five state television channels present a mixture of official speeches and popular entertainment.⁵ (In 2013 Cuba added Venezuela’s TeleSur, a mouthpiece for the government of Hugo Chavez, which provides some international news but steers clear of critical reporting on Cuba or Venezuela.⁶) Other media outlets, including radio stations and church publications, operate under similar restrictions. The U.S. government-funded Radio and TV Martí broadcasts serve an influential minority; one survey estimated that 20 percent of the Cuban population tuned in at least once a week.⁷ But most Cubans have inhabited a news vacuum—until the advent of digital media.

Cuba’s decades of news blackout will have a dramatic impact on the shape of the information culture in Cuba. It is entirely possible that Cuba could skip over the fact-based journalism models of the late twentieth century, straight into a digital maelstrom of rumor, data, marketing—and, somewhere amid the tumult—news.

The Fiber Optic Cable: Cuba's Big Little Bang

When Raul Castro took over the government from his ailing brother in 2006, he announced, “We reform, or we sink,” and there was no way to salvage the economy without modernizing communications.⁸ Cuba had nominally connected to the Internet a decade earlier, but access was extremely limited. Individual Cubans were barred from purchasing their own computers or cellphones, and connections from satellite signals ranged from slow to non-existent.

In 2007 the government announced a new fiber optic cable project designed to increase the national bandwidth by a factor of three thousand. ALBA-1 runs undersea from the Venezuelan port city of La Guaira to Santiago de Cuba; an additional leg connects Cuba to Jamaica. The cable was financed by Telecomunicaciones Gran Caribe, a partnership between Telecom Venezuela and Cuban Transbit, both state-owned companies. Gran Caribe commissioned Alcatel-Lucent Shanghai Bell (ASB) to build it.⁹



SOURCE: Telegeography



The project was plagued by setbacks and corruption. Reports emerged from Havana that various Cuban officials had been arrested and convicted of malfeasance. Scheduled for completion in 2010, the cable was completed the following year, but it didn't go live until 2013. Cuban bandwidth improved, but it has not approached the promised levels.

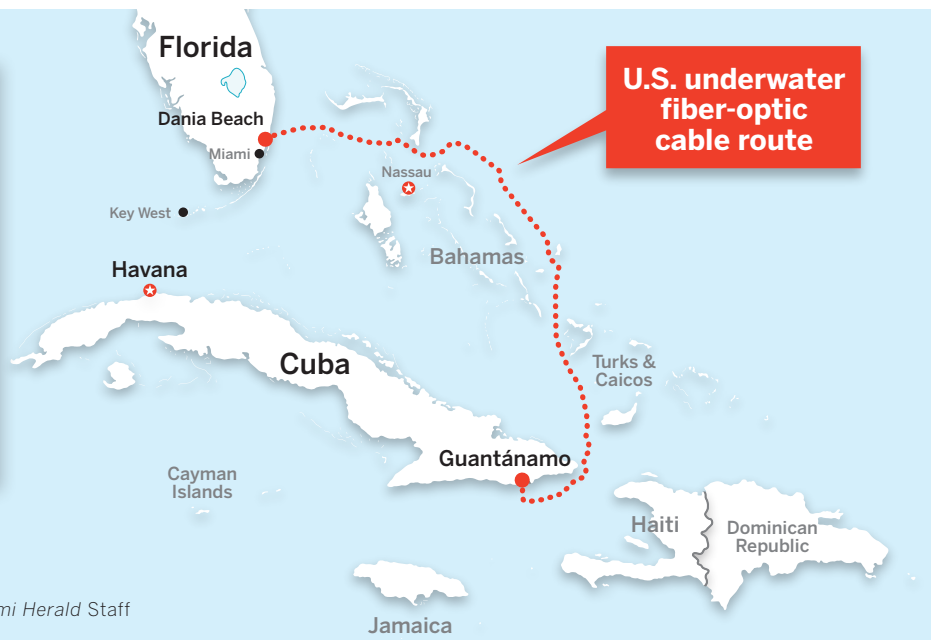
ALBA-1's problems are far from over. There are reports that Cuba's costs have risen as much as six-fold in recent months. Furthermore, the service relies on a single cable that could be cut by a ship's anchor; the only redundancy (backup) lies in a fork to Jamaica.

In January 2016, the U.S. Navy entered the picture by activating a fiber optic cable connecting a Navy facility at Dania Beach, FL, to the base at Guantanamo. Six months later the Pentagon announced plans to build a second cable from Puerto Rico to create redundancy.¹⁰ There has been public discussion of making the service available to Cubans at some point, but it is unlikely that the Cuban government would approve it any time soon.

Looking at the map, clearly the most logical connection would be between Miami and Havana. There is interest in building a cable on both the U.S. and the Cuban sides, but there are also considerable obstacles. One hurdle is the animosity between the Cuban exile community in Miami and the Cuban government in Havana; it has diminished, but it hasn't disappeared. Another lies in the cautious Cuban bureaucracy, which tends to answer controversy with stalling tactics. According to one U.S. source close to the process, "The Cuban delays are the result of entropy and skepticism—they're much more incentivized to say no than to say yes."

U.S. Military Fiber-Optic Cable

The Navy says a Texas firm got the contract to build the cable landing station at the U.S. Navy base at Guantánamo for a fiber-optic link expected to be up and running in February 2017.



SOURCE: U.S. Navy; and Marco Ruiz, *Miami Herald* Staff

China's Role

Given its high level of distrust, the Cuban government initiated its transition to digital media with traditional allies: first the Soviets, and later, Chavez's Venezuela. But China has served as a hidden hand in Cuba's modernization. In 2015, Larry Press, a leading expert on Cuban communications, reported, "Cuba has turned to China, not the U.S., for Internet connectivity and equipment and is committed to doing so in the short term future."¹¹

The Chinese government and tech companies collaborate closely on their international ventures. The Chinese government offered the Chavez government \$4 billion in loans, some of which were used to finance the \$70 million fiber optic ALBA-1 cable.¹² Routers and cellphones manufactured by the Chinese tech giant Huawei are ubiquitous in Cuba, and the company has bid to construct "backbone" technology to connect ALBA-1's landing point in the southeastern city of Santiago to the northwestern city of Havana. (Some believe that this project is already being implemented.) Other leading companies in the hardware market are China's ZTE and the European firms Alcatel-Lucent and Ericsson.¹³

There are at least two factors in Cuba's adoption of Chinese hardware. One is policy, as reflected in Cuba's reported switch from Cisco to Huawei routers in government offices. The other is cost. Huawei and other Chinese countries have claimed a large share of the global market in cheap cellphones and tablets. High-end cellphones are popular but beyond the means of Cubans who don't have relatives abroad to provide them. Huawei's major U.S. rival is Miami-based BLU, which sells inexpensive mobile devices that are unlocked and compatible with Cuba's 2G GSM network.¹⁴

However, even China has experienced bumps in the road. Chinese companies, like their foreign counterparts, find Cuba's business dealings anything but timely and transparent; major Huawei contracts have stuttered and stalled for reasons that are still obscure. Nonetheless, the Chinese have established an incumbent's advantage in the Cuban hardware market. "It will not be easy for the U.S. to compete against the Chinese in Cuba," Press holds. "That is one of the hidden costs of the U.S. embargo."



"It will not be easy for the U.S. to compete against the Chinese in Cuba. That is one of the hidden costs of the U.S. embargo."

— LARRY PRESS

Enter the Americans

Virgin markets for technology have become increasingly scarce, and corporations looking for new worlds to conquer have been intrigued by Cuba for some time, though not for short-term financial gain. The island's 11 million inhabitants struggle with a deeply depressed economy, even compared to its Caribbean neighbors.

On the other hand, Americans find that the past half-century has given Cuba the cachet of forbidden fruit, and it offers the thrilling prospect of imprinting tech innovations on a virtual tabula rasa. And, as one U.S. technology strategist added, Cuba also holds strategic interest: "It is geographically centric in the Caribbean and Central America, and it could be a transit hub in the region, as it was for telephony back in the day."

Google was an early arrival. The company's interest dates from 2014, when its analytics began to record "scrappy things" occurring in Cuban user behavior: flash drive-based content circulating on the service called *El Paquete*; a lively blogging culture, and other characteristics that were surprising to find in an authoritarian country.

In June 2014 Google's executive chairman, Eric Schmidt, traveled to Cuba to pursue talks with government officials about the potential for the Internet in Cuba. Unknown to Schmidt, his visit coincided with secret White House negotiations with Havana to reopen relations. A Cuban government study at the time placed Internet penetration at 30 percent, but Google's internal user studies showed that the figure was closer to 3 to 5 percent.¹⁵ Schmidt saw the U.S. embargo as a clear impediment. When he returned to the United States, he issued an open call to lift the embargo—which dovetailed neatly with the Obama Administration's goals.

By the end of the year, a number of initiatives had been set in motion. The United States and Cuba agreed to an exchange of prisoners, which freed U.S. government contractor Alan Gross. The Obama administration took Cuba off the list of states that sponsor terrorism, and the two countries took steps to reopen their respective embassies for the first time in more than 50 years. Washington also quietly loosened ICT trade restrictions.

Google began to launch products that didn't violate existing trade restrictions—namely web-based services that couldn't be reverse-engineered and didn't require financial transactions. These started with Google Chrome and continued with Google Play (free apps) and non-paid Google Analytics, using a combination of general and specific licenses. Google walked a fine line; in the words of one tech insider,



Google began to launch products that didn't violate existing trade restrictions—namely web-based services that couldn't be reverse-engineered and didn't require financial transactions.

the Google initiatives were “legal on U.S. side and well received by the Cuba government.”

The Chinese inroads into the Cuban hardware market were not a particular concern. Marketing basic networking hardware, such as routers and switches, is not a core business for Google, and the company has partnered with Huawei to produce some of its current generation of Nexus smart phones.

Google is more interested in building connectivity infrastructure, marketing Google products, and laying the groundwork for future advertising. In contrast, as one tech insider points out, “The Chinese aren’t building networks, they’re fulfilling RFPs for equipment.” The online publication *Quartz* pointed out how Google could fit into Cuba’s existing digital environment: “Google could provide Wi-Fi expertise and equipment to bolster the informal mesh networks that have sprung up to close the internet gap... at reduced cost, or free in exchange for ‘powered by Google’ branding—though that might be a tough sell for communist officials.”¹⁶

Google has continued to make inroads, most recently in partnership with an artist, Alexis Leiva Machado, who goes by the name Kcho (“Cacho”). In January 2015 Kcho, who has close relations with the Cuban government, received permission to open the first free public Wi-Fi spot as part of an art installation. In 2016 Google supported the addition of a free Internet facility called Google + Kcho.MOR. (“Google más Cacho Mor”). The project received wide publicity, both in Cuba and beyond, but Larry Press was unimpressed, criticizing the project for its “kowtowing and hyperbole.”¹⁷ The facility’s connections are slower than anticipated, and only 20 people can go online at a time. Nonetheless, it serves as both a demonstration of the Cuban government’s increasing openness to the Internet and a highly visible branding exercise for Google.

Other U.S. companies have been far less proactive. In April 2016, the CEO of Microsoft reported that he had recently received “this [e]mail from someone in Cuba saying... I want to be a partner.”¹⁸ Facebook and Twitter are popular in Cuba, but neither has established a corporate presence on the island. In 2015 Facebook founder Mark Zuckerberg told the Summit of Americas that Cuba “will be something we might consider over time” because “it might fit within our mission.”¹⁹ But the company has made few inroads with the government, and Zuckerberg’s own long-anticipated visit to Havana has yet to materialize. Twitter has been hampered by the lack of short codes that would enable Cubans to tweet by text (as opposed to expensive and inconvenient Wi-Fi).

Many U.S. companies have been stymied by Cuba’s dysfunctional



In January 2015, artist Kcho (“Cacho”), who has close relations with the Cuban government, received permission to open the first free public Wi-Fi spot as part of an art installation.

© Anteros01 / CC BY 3.0 (<http://creativecommons.org/licenses/by/3.0/>)
via Wikimedia Commons (<http://commons.wikimedia.org/licenses/by-nc/2.0/>)

As restrictions relaxed, more U.S. companies arrived, each one filling a gap that eased transactions and built bridges between Cuba and the United States.



currency and banking system. Cuba has a dual currency, the Cuban peso, or CUP (which allows Cubans to buy national products at subsidized prices); and the convertible peso, or CUC, which obliges foreigners to make most of their purchases pegged to the U.S. dollar. Businesspeople have encountered another stumbling block in the Cuban and U.S. Treasury regulations, especially limitations on the transfer of funds to U.S. banks. Cuba has also functioned without credit cards, meaning travelers have been obliged to carry cash.

As these restrictions relaxed, more U.S. companies arrived, each one filling a gap that eased transactions and built bridges between Cuba and the United States. Netflix started streaming service to Cuba in February 2015, though the low bandwidth meant that few Cubans could access it. Verizon began to offer roaming service and reduced rates for Cuba in 2016, soon to be followed by Sprint and T-Mobile.²⁰ Airbnb was an early entrant to the Cuban market in 2015, taking advantage of the country's shortage of hotel rooms and the run-down conditions of the state-owned hotels. But the company and the participants had to cobble together ways to book rooms in homes without the benefit of Internet connections, and create payment systems for hosts who couldn't participate in e-commerce transactions.²¹

The payment problems are also being resolved. PayPal arrived in Cuba in March 2016, and a few months later Mastercard announced that it would offer Cuba's first credit cards, just as Starwood was opening the first American-operated Sheraton hotel.²²

Beneath these advances lies an inconvenient truth. Even as the regime's controls appear to be loosening, its members have positioned themselves, their relations, and their supporters to reap the benefits. Airbnb's listings are built on the government-approved lists for "casas particulares" (private homes); Airbnb hosts still need government approval to participate, but they can charge something approaching market rates, as opposed to the government's \$35 nightly rate. The new Sheraton is owned by the Cuban military.²³ As long as the current regime holds power, the principal economic benefits are likely to flow to Cuba's nomenklatura and their friends and relations, in keeping with the economic transitions in China and the former Soviet bloc.

Who Makes Cuba's Digital Policy?

Reading the tealeaves of Cuba's digital future requires a grasp of the Cuban government strategies, and these have been subject to a generational divide that runs through Cuba's antiquated bureaucracy.

The web of agencies starts with the Ministry of Communications, which owns the Cuban telecommunications company ETECSA, which in turn oversees Cubacel, the national cellphone provider. In March 2014 ETECSA launched NAUTA, a mobile e-mail service for smart phones using the 2G network.

The communications ministry has had strong ties to the Cuban Revolutionary Armed Forces (FAR) going back to the revolutionary era. The old guard has taken a dim view of the Internet. Soon after Eric Schmidt's 2015 visit, José Ramon Machado Ventura, then first vice president of the Council of State, pointedly warned:

*Some want to give us [the Internet] for free. However, they're not offering this as a way to help the Cuban people communicate, but as a way to penetrate us and do ideological work for a new conquest. We must have Internet, but in our own way, with the knowledge that the intention of imperialism is to manage the Internet as just another way to destroy the Revolution.*²⁴

In 2007 another member of the old guard, then-communications minister Ramiro Valdés, explained the rationale behind the fear:

*There are many doubts of a political character respecting the new technologies. The Internet is like a wild colt that can't be tamed. If businesses like Verizon, Google, or AT&T invest, and access to broadband is made available to everyone at reasonable prices, the State loses a great deal of control over information. They're concerned above all with the social networks that activate pockets of groups that are disaffected with the regime.*²⁵

Valdés stepped down from his position in 2011 amid the cloud of arrests and allegations of corruption regarding the financing of ALBA-1. His replacement, Maimir Mesa Ramos, is another member of the old guard, a general in the FAR and the former head of ETECSA, the state telecom.

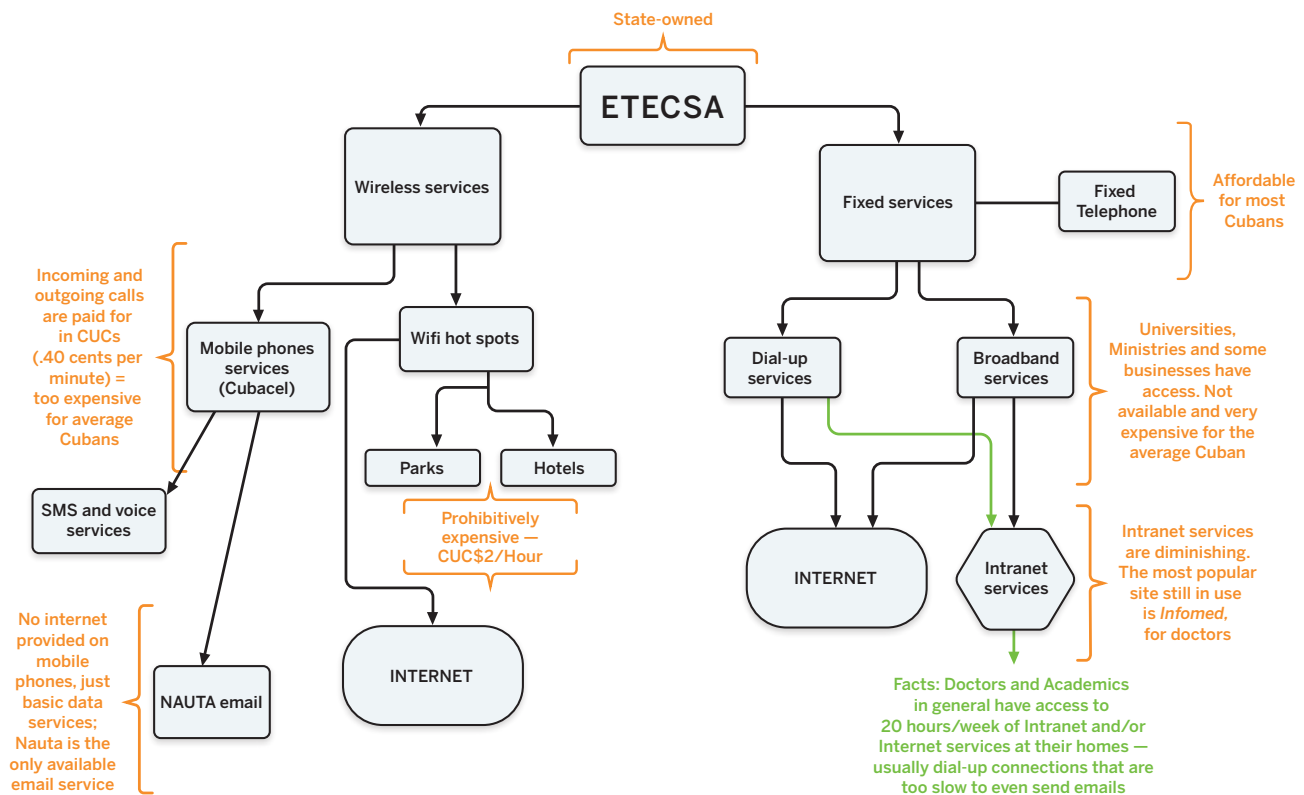
But a younger generation of technocrats is beginning to take charge. One example is the communication ministry's CEO and first vice minister, Jorge Luis Perdomo. He is joined by Miguel Diaz-Canel, the current first vice president of the Council of State and a likely successor



People wait in line outside the Telecommunication company known as ETECSA which is a government owned telephone, Internet, and wireless services provider in Cuba.

© Matyas Renak/Shutterstock.com

Map of Cuban Telecommunications Company ETECSA



SOURCE: Laura Lehman and Mariela Machado Fantacchiotti

to Raúl Castro. Trained as an electrical engineer and an educator by profession, Díaz-Canel has argued for greater openness to the Internet as a road to progress and to counter to Cuba's increasing brain drain. In December 2014 he declared:

The development of information technology is essential to the search for new solutions to development problems... but the digital gap is also a reality among our countries, and between our countries and other countries, which we must overcome if we want to eliminate social and economic inequalities."²⁶

The Cuban Model

In June 2015 the Ministry of Communications completed the "National Strategy for the Development of Infrastructure for Broadband Connectivity in Cuba."²⁷ The document acknowledged that Cuba lagged far behind and described the barriers in unusually forthright terms: "conceptual, economic, technological, regulatory, and organizational."

It emphasized Cuba's shortage of investment capital, which has limited the upgrading of last-mile infrastructure. The 10-page plan announced various goals, starting with 100 percent broadband connectivity by 2018 in Communist Party and State offices down to the municipal level, and similar goals for educational, cultural, and health facilities. The plan includes individual access, but places it much farther down the list of priorities, aspiring to no less than 50 percent broadband access for homes and 60 percent mobile penetration for the population by 2020. The plan follows the sectoral approach, giving special attention to broadband services for education and health services in rural areas.

The plan was the product of the Council of Informatization and Cybersecurity, whose name reflects the Cuban approach to digital media. Cuba's university system tends to place digital media in an isolated traditional computer science curriculum, rather than integrating it into broader curricula. The University of Information Science on the outskirts of Havana features some of the most advanced technology in the educational system. At the University of Havana, on the other hand, there was no Wi-Fi available as of 2016, and the institution's 25,000 students compete for the use of the campus's 3,000 desktop computers.²⁸ The university library still operates with a paper card catalogue, without access to digital collections or Google Books. The library's lone, antiquated desktop computer is used to register library cards.

Cybersecurity has long been a central concern. As comments by members of the old guard reveal, they have tended to consider U.S. tech corporations as Trojan horses for U.S. intelligence interests. They have traditionally exerted control over digital media by restricting it to "vertical sectors" that correspond to state ministries and programs. Computers and Internet connections were parceled out to state agencies and businesses, and home usage was limited to a few sectoral exceptions such as doctors.

In this regard, Cuba appears to have been heavily influenced by the Chinese model, especially in its anxiety around social media. For a period, Cuba restricted access to foreign platforms and attempted to set up a parallel universe of Cuban user-generated content, echoing China's **Sina Weibo** (a Chinese version of Facebook), **Tencent QQ** (Chinese Twitter) and other platforms. China's social media has become a powerhouse, and China has successfully launched its own apps, such as WeChat, on the global market.

However, Cuba, with roughly one-thousandth the population of China and far more primitive technology, has far more modest national platforms. **CubaRed.com**, Cuba's version of Facebook, describes itself as "Cuba's biggest social network," with some 87,000 members as of



© Anne Nelson

At the University of Havana, there was no Wi-Fi available as of 2016, and the institution's 25,000 students compete for the use of the campus's 3,000 desktop computers. The university library still operates with a paper card catalogue, without access to digital collections or Google Books.



© Anne Nelson

July 2016; its principle features are photos and free text messages. **EcuRed.cu**, Cuba's answer to Wikipedia, was founded "to create and disseminate knowledge from a decolonized point of view." As of July 2016 it featured just under 160,000 articles. **Reduniv** (<http://reduniv2.mes.edu.cu/>) administers a virtual network from an ETECSA facility to connect smaller university intranets, including international partners (so far non-U.S.). However, Reduniv has an outmoded design, numerous broken links, and other signs of poor maintenance.

The most successful Cuban platform may be **Infomed** (<http://www.sld.cu/>), which serves Cuba's remarkably successful public health sector. The partially password-protected site provides the country's medical community with information from Cuban and foreign medical journals, curated by specialists.²⁹ The platform is extensive, well maintained and user-friendly. Nonetheless, some Cuban doctors report that they prefer Google searches, which yield a broader array of content.

Mobile

Even after the government legalized the private ownership of cellphones and personal computers in 2008, users were severely limited by costly, erratic satellite signals. The ALBA-1 fiber optic cable, whatever its disappointments, laid the foundation for the expansion of digital media.

ALBA-1's landing point near the southern city of Santiago means that its signal must be carried the length of the island's "backbone" to reach the capital of Havana. The Ministry of Communications claims that coverage reaches almost 75 percent of the national territory. Cuba's backbone and last-mile infrastructure is still problematic, though some experts believe there is a dark fiber network (meaning not available for public use but can be "lit" from time to time for government use) from ZTE or Huawei.

There is little up-to-date information concerning Cuba's domestic fiber optic networks, but in 2011 Larry Press published an ETECSA map outlining the plans as of 2003:

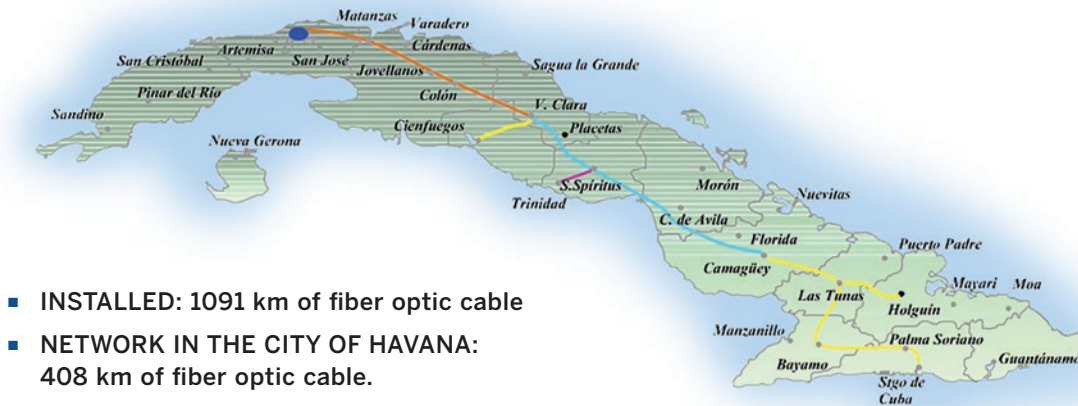
Cuba's cellphones still primarily run on 2G networks (which was the U.S. standard circa 2006), although some areas around Havana have advanced to 3G. The national broadband plan calls for the government to upgrade most of the country to 3G and priority areas around Havana to 4G. Mobile penetration was placed at 21.4 percent in 2015, and it is growing rapidly as prices come down.



© Anne Nelson

Cuba's last-mile infrastructure is still problematic.

National Network for Fiber Optic Transmission



SOURCE: laredcubana³⁰

Implications for Mobile News and Information

Given the advances of the fiber optic cable and cellphone penetration—and the tight control of other media—it appears that Cubans are leapfrogging directly to mobile for news and information, bypassing previous platforms. This has required the addition of the missing link of Wi-Fi signals (since data plans are still unavailable for cellphones in Cuba).

In June 2013, the government opened 118 Internet cafés (called “salas de navegación”) equipped with desktop computers, offering access to the Cuban Internet for about 60 cents an hour and to the World Wide Web for about \$4.50 an hour.

Two years later ETECSA began opening Wi-Fi hotspots, many of them in public parks, their number reaching 90 by March 2016. On July 4, ETECSA announced it would open Wi-Fi hotspots to all of the municipalities in the northern province of Sancti Spíritus, and more are sure to follow.

The hotspots tend to be crowded with users, who require their own Internet-enabled devices. Some bring notebook computers, but the majority use cellphones. The connections are maddeningly slow by U.S. standards. Users go online by purchasing minutes from ETECSA's Nauta agency at the price of \$2 an hour—which is ten percent of a monthly state salary. The cellphones themselves are often obtained through Cuba's “suitcase economy,” which favors Cubans who have relatives



© Anne Nelson

Informal shops sell devices courtesy of the “suitcase economy”



View of Fe del Valle park in Havana Centro neighborhood. This is one of a growing number of access points in Cuba.

Cubans have now gained access to a broad array of foreign platforms. Google and Facebook are especially popular. The Cuban government has established a presence on U.S. social media.

living abroad or with ties to the Communist Party. Travelers or visitors from abroad can bring in devices that are resold for a handsome profit.

Cubans have now gained access to a broad array of foreign platforms. Google and Facebook are especially popular. The Cuban government has established a presence on U.S. social media; the Ministry of Communication's Twitter feed, @MINCOMCuba, combines ministry updates with propaganda praising Fidel and disparaging dissident groups such as the Damas de Blanco (Ladies in White).³¹ The CiberCuba news service, "la voz digital de los cubanos" (the digital voice of the Cubans) has both a Facebook page and a Twitter feed (As of July, 2016, it had just over 3,500 followers).

Other popular social media platforms, such as Instagram and Pinterest, are virtually unknown in Cuba, and most Cubans are unfamiliar with hashtags and other social media conventions.

Cubans are able to access an increasing number of foreign news organizations online, ranging from the *Miami Herald* to the BBC. But the government still blocks access to many dissident voices, both domestic and exiled.

Cuba's Hacker Culture

Despite Cuba's ongoing challenges of censorship and infrastructure, it has entered into a remarkable transitional phase. Production of content and access to information are burgeoning. Many of these advances are the product of an innovative hacker culture that has made ingenious use of severely limited resources.

In the spring of 2016 a team of Columbia University graduate students researched the world of Cuban offline apps, combining online research with extensive interviews in Cuban urban and rural areas. They came up with some surprising findings, which they published on an extensive wiki.³² They learned that scarcity and expense of Wi-Fi connections have prompted young Cubans to explore the potential of offline app-sharing, much of it based on Bluetooth connections. This is often conducted through a popular app called Zappya, which allows users to connect two or more phones to share files. Their new offline apps carry out functions that require an Internet connection in other markets. These include IMO, which permits video chatting in low connectivity settings. (Skype service in Cuba is available on an erratic basis, despite sporadic efforts to block it.)

Cubans have also discovered how to install solar charges for their phones that don't require a connection. An app called Ke Hay Pa Hoy, sponsored by the Ministry of Culture, lists cultural events around Havana and updates other apps through e-mail or Wi-Fi connections. An app called aPlus Saldo transfers credits between phones. Cubans have shown similar ingenuity in tapping into ETECSA hot spots to feed Wi-Fi directly into homes and other means of pilfering signals.³³

El Paquete

But perhaps the biggest impact in Cuban digital media has been made by a service that requires no connection at all. This is "*El Paquete*,"³⁴ a game-changing weekly news and entertainment service distributed via a one-terabyte flash drive. *El Paquete* surfaced about a decade ago, the project of a group of young Cuban music and film enthusiasts who were keen to collect and distribute content. One of them, Elio Hector López—known as "El Transportador"—has emerged as the semi-public voice of *El Paquete*.³⁵ The government initially reacted against the service, but eventually relented and chose to cast a blind eye so long as it does not promote "counter-revolutionary" content. "They don't stop the package,



© Anne Nelson

IMO is a popular app in Cuba for live chat.

but nobody in the government helps to make the package,” López told the Canadian Broadcasting Corporation “This is something started from the people.”³⁶

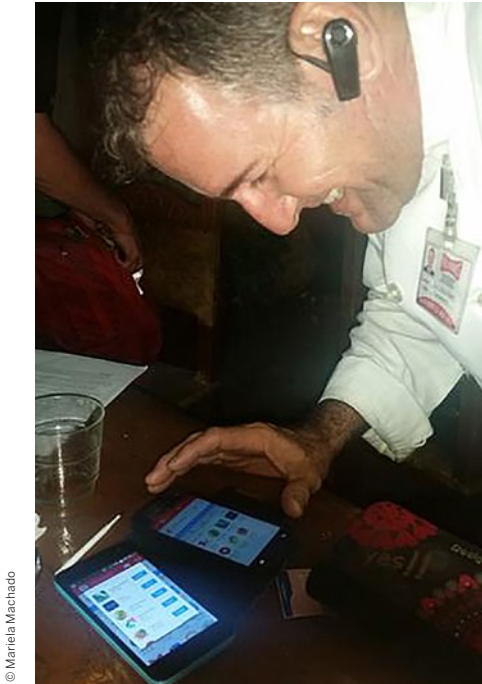
As Mariela Machado wrote on the Columbia Wiki:

The legality of El Paquete is not as straightforward as one might think. El Paquete is neither legal nor illegal. The government simply tolerates it because a majority of Cubans pay for the service and speak openly about it in their communities. However, in an effort to maintain control over the situation, the government sometimes locates and threatens local managers with punishment for “breaking the law.”

*In response, the managers change their tactics, decrease their public presence, and restrict sales to trusted customers. However, no law establishes this activity as illegal, and until that changes, El Paquete will remain a permanent fixture in the Cuban society.*³⁷

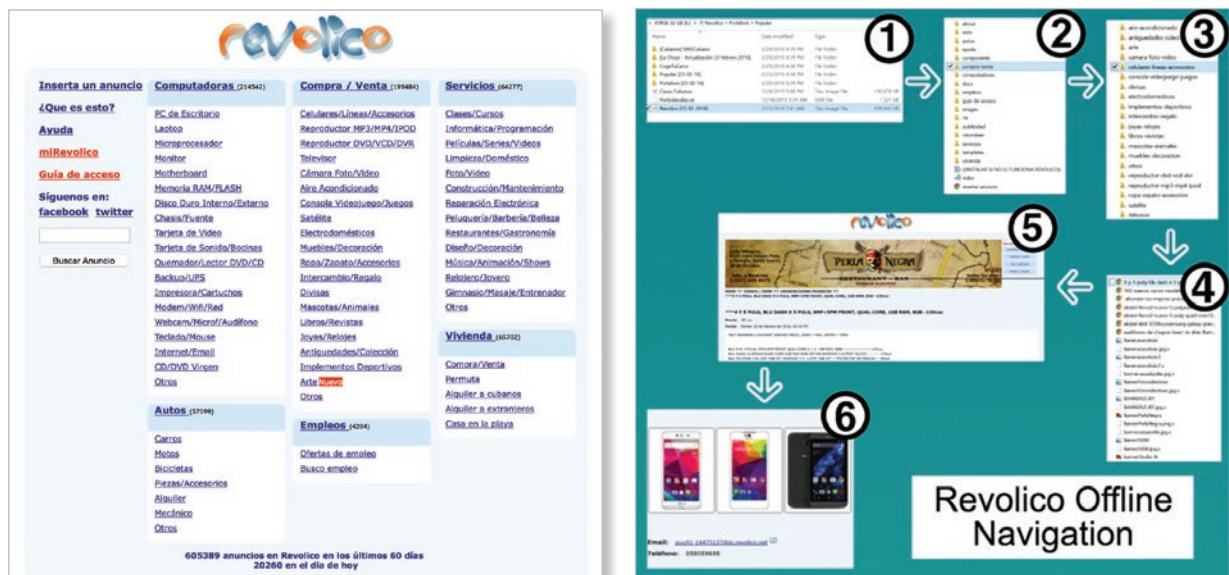
The production of the service is somewhat secretive. According to the Columbia research team, the content is downloaded by small teams across Cuba that receive passwords and usernames from the “Paquete owners,” who then pay to download content by the hour. The local managers download the content that will appeal to their specific audiences; university students might want to read the week’s *New York Times*, the *Economist*, and the BBC, while rural audiences might prefer South American telenovelas and variety shows. Most local managers download the content directly from the Internet, then copy and distribute it to a larger network that dispatches couriers to deliver it by public bus throughout the country. Customers pay around \$2 to download the material to external disks and flash drives, often plugging them directly into a port on their flat screens; then returning for new content.

Like most foreign content in Cuba, *El Paquete*’s materials are pirated. Cubans happily binge on the latest seasons of *House of Cards*, *Game of Thrones*, and other series that Americans must pay steep cable bills and premium services to watch. One can no longer say that Cubans are cut off from the outside world simply by virtue of their lack of professional domestic journalism—even if news coverage of their own country is still sadly lacking.



© Mariela Machado

Passing apps to another phone using Zappy



Screens from the advertising website Revolico.

One of the more intriguing elements of *El Paquete* is the inclusion of the advertising website *Revolico*. In Cuba, the site resembles and functions like an offline Craigslist. Cubans post ads for everything from used books to beach rentals, listing their phone numbers instead of e-mail contact information. Users outside Cuba can access the site online, and it makes money abroad with digital ads. (In this respect, *Revolico* may follow Craigslist's example of capturing the classified market before Cuban print journalism even has a chance to compete.)

Once Cuba completes the process of wiring the country it is easy to imagine *Revolico* making a seamless transition to an online platform bringing its well-established user base. It's harder to predict what will happen with *El Paquete*'s cheerful piracy. As other markets have discovered to their dismay, once audiences get used to free content, it's difficult to convince them to pay. It may be that Cuba's isolated, underpaid population of 11 million won't constitute a large enough market for large international businesses to worry about—unless the model spreads to the point of becoming a broader commercial threat.

In Cuba, Revolico resembles and functions like an offline Craigslist. Cubans post ads for everything from used books to beach rentals, listing their phone numbers instead of e-mail contact information. Users outside Cuba can access the site online, and it makes money abroad with digital ads.

Conclusion

For many years, the media development conversation regarding Cuba has largely focused on the country's harsh censorship practices and other restrictions on freedom of expression. Those concerns remain. But with the opening of relations with the United States over the past two years, the conversation has widened.



Everyone interested in Cuba should be prepared for surprises: Official Cuban outlets have pretended that everyone supports the government, and dissident voices sometimes suggest that no one does.

U.S. government and business interests have reengaged with Cuba, and the clock is highly unlikely to be rolled back. There is going to be more digital media in Cuba, and more Cubans are going to go online. The Internet will continue to advance, and the regime's old monolithic message will become less possible to sustain. The future of journalism is impossible to predict in Cuba, other than to say it is bound to get better. The Cuban journalism of the future is likely to skew to online platforms.

Everyone interested in Cuba should be prepared for surprises: Official Cuban outlets have pretended that everyone supports the government, and dissident voices sometimes suggest that no one does. Both of these positions will need to evolve. Some of the most influential voices in Cuban journalism will belong to the "loyal opposition," who are independent critics of the Communist Party but do not support the overthrow of the regime—in part, because fear of a violent political transition in Cuba runs deep. They are, for the most part, young, and their work is found overwhelmingly in online outlets.

But beyond the question of journalism, Cuba offers an additional opportunity, based on its interest in the sectoral application of digital media to advance social goals. This opportunity will have little connection to journalism schools, training, and outlets (which will advance on parallel tracks). Instead, it connects to the dynamic field of Information and Communications Technologies for Development (ICT4D), as explored by institutions as diverse as BBC Media Action and the California-based design firm IDEO.

Cuba has many features that make it an effective laboratory for ICT4D innovations: a highly literate, educated workforce; a manageable geography; and the urgent incentive of a broken system. One obvious starting point is agriculture and food security. Cuba imports most of its food; Cuban agriculture is highly inefficient, and farmers lose a significant amount of their produce in the process of getting it to market. Citizens spend an inordinate amount of time searching for

goods. Information on local weather conditions can be problematic and crop insurance is unfamiliar. Cuba has invested heavily in organic farming, but many environmental concerns remain, including in the critical area of oceans and sustainable fisheries. All of these issues have been addressed in projects executed elsewhere in the world through SMS and other digital platforms, creating new efficiencies through information transparency.

But U.S. officials should be mindful of historical complications. USAID may not be the most appropriate agency to undertake this work in the early phases, given the high level of mistrust in Cuba generated by unfortunate experiences.³⁸ The U.S. Department of Agriculture, on the other hand, has been advancing its partnerships with the Cuban Ministry of Agriculture, departing from the shared interests of food exports, but expanding into shared research in the areas of nutrition, marketing, and environmental concerns.³⁹ Digital media has made significant contributions to all of these areas in other countries, including low-bandwidth areas that rely on SMS platforms, like many Cuban farmers. This area is ripe for exploration. Another possible partner is Google Earth Outreach, which has benefited international efforts in environmental sustainability. (European and Canadian actors in the media development sphere may find fewer short-term complications than their U.S. counterparts.)

Many informed observers have noted that the Cuban university sector is comparatively open to cooperation with their international counterparts, and this may suggest opportunities for programs at MIT, Penn State, and Columbia in the United States, as well as Stockholm University and the University of Manchester in Europe.

Cuban culture is another promising beneficiary of the digital revolution. Cuba's painters, dancers, and musicians are world-class, yet they have little exposure online. Cuban cultural institutions still run on an analog system. (The celebrated Ballet Nacional's box office sells tickets by crossing off seats on a sheet of paper with a pencil.) Cuban artists and tourists alike would benefit from jumpstarting an online presence to publicize events, sell tickets, and connect with artists in the world beyond. Cuban students lack access to the knowledge contained in the world's journals and digital libraries, and they often lack the means to share their own intellectual expressions. We can expect a burst of intellectual exchange when these connections are formed.

We should not discount what the Cubans have to offer. Vast regions of Africa, Asia and Latin America struggle with erratic electrical grids and low bandwidth. The Cubans' ingenious approach to offline apps might



Cuban culture is another promising beneficiary of the digital revolution. Cuba's painters, dancers, and musicians are world-class, yet they have little exposure online. Cuban cultural institutions still run on an analog system.



We should not discount what the Cubans have to offer.... The Cubans' ingenious approach to offline apps might suggest solutions in these areas, just as Cuban doctors have proved helpful in low-resourced medical emergencies.

suggest solutions in these areas, just as Cuban doctors have proved helpful in low-resourced medical emergencies. Various U.S. universities and their media labs could forge constructive partnerships with their Cuban counterparts to explore these possibilities.

Over time, history has demonstrated that more media necessarily means less controlled media. The Soviet government was able to control print and broadcast outlets, but the fax machine and the photocopier weakened its grip. The Chinese have invested vast resources in controlling digital content and silencing dissent in China. Nonetheless, the Chinese people undeniably receive and impart more information than ever before.

Cuba will be no exception to these historical trends. The Communist regime remains, but Cuba is no longer frozen in time. As access to digital media grows, the Cubans are asking new questions, and with some luck and the right search terms, digital platforms should help them find new answers.

Endnotes

- ¹ See <http://techpresident.com/news/wegov/23702/cuba-highly-restricted-internet-access-leaves-population-hungry-more>
- ² <https://ict4cuba.wikischolars.columbia.edu/Project+Overview>
- ³ <http://www.drinkerbiddle.com/Templates/media/files/Memos%20And%20Newsletters/International/Telecommunications-in-Cuba.pdf>
- ⁴ Serazio, Michael, "Guerrilla Marketing: How Cubans Work Around a National Ban on Advertising," The Atlantic, March 21, 2016. <http://www.theatlantic.com/business/archive/2016/03/how-do-cubans-do-business-in-a-country-that-bans-ads/474507/>
- ⁵ In recent times these have included pirated Hollywood films, Latin soap operas, Russian fashion shows and Chinese nature programs. In March 2016 Cuban state television offered a prime time broadcast of "The Danish Girl."
- ⁶ Freedom House Report, 2015. <https://freedomhouse.org/report/freedom-press/2015/cuba>
- ⁷ <https://www.benton.org/headlines/20-percent-cubans-report-listening-radio-marti>
- ⁸ <https://www.foreignaffairs.com/articles/cuba/2013-06-11/cuba-after-communism>
- ⁹ <http://laredcubana.blogspot.com/2013/08/alba-1-undersea-cable-background.html>
- ¹⁰ <http://www.military.com/daily-news/2016/06/29/us-military-wants-another-fiber-optic-cable-guantanamo-bay.html>
- ¹¹ <http://laredcubana.blogspot.com/2015/09/cuban-infrastructure-investment-china.html>
- ¹² <http://www.wsj.com/articles/SB10001424052970203733504577026073413045462>
- ¹³ There have been recurring concerns that Huawei and ZTE could pose a security risk to U.S. interests, as noted in a 2012 report by the House Intelligence Committee. See <https://www.theguardian.com/technology/2012/oct/08/china-huawei-zte-security-threat>
- ¹⁴ GSM, or Global System for Mobiles, is the cellphone radio system used in most of the world, but several major U.S. carriers use another system called CDMA.
- ¹⁵ <https://freedomhouse.org/report/freedom-net/2015/cuba>
- ¹⁶ <http://qz.com/354110/how-google-can-make-cubas-web-truly-worldwide/>
- ¹⁷ <http://laredcubana.blogspot.com/2016/03/opening-of-googlekcho-tech-center-much.html>
- ¹⁸ <http://www.businessinsider.com/satya-nadella-microsoft-interview-with-business-insider-2016-4>
- ¹⁹ <http://www.nytimes.com/video/multimedia/100000003620481/mark-zuckerberg-cuba-something-that-we-might-consider.html>
- ²⁰ <http://www.budde.com.au/Research/Cuba-Telecoms-Mobile-Broadband-and-Digital-Media-Statistics-and-Analyses.html>
- ²¹ See <https://www.foreignaffairs.com/articles/cuba/2016-04-05/business-unusual-cuba>
- ²² <http://www.nbcnews.com/news/latino/mastercard-will-be-available-havana-atms-n600546>
- ²³ <http://www.miamiherald.com/news/local/news-columns-blogs/fabiola-santiago/article86976702.html>
- ²⁴ <http://www.miaminewtimes.com/news/cuba-worried-imperialist-google-may-try-to-subvert-the-revolution-7749796>
- ²⁵ http://www.diariolasamericas.com/4847_cuba/3063248_etecsa-cuba-comunicaciones-celulares-llamadas-ivan-garcia-diario-americanos.html April 26, 2015. See also: <http://www.havanatimes.org/sp/?p=57806>
- ²⁶ <http://www.latimes.com/world/mexico-americas/la-fg-cuba-succession-20150207-story.html>
- ²⁷ <http://translatingcuba.com/wp-content/uploads/2015/06/Cuban-Govt-Broadband-Plan-June-2015-v3.pdf>
- ²⁸ <http://laredcubana.blogspot.com/2016/01/a-universiy-of-havana-hot-zone.html>
- ²⁹ See <https://ict4cuba.wikischolars.columbia.edu/ICT4+Health+in+Cuba>
- ³⁰ <http://laredcubana.blogspot.com/2011/10/cuban-backbone-november-2003.html>
- ³¹ <https://twitter.com/MINCOMCuba/status/749814941042049024>
- ³² <https://sipa.columbia.edu/news-center/article/mdp-students-survey-digital-media-in-cuba>; The wiki can be found at: <https://ict4cuba.wikischolars.columbia.edu/Offline+Apps>
- ³³ <https://www.foreignaffairs.com/articles/cuba/2016-04-19/cuban-internet>
- ³⁴ Sometimes called *El Paquete Semanal*, or "The Weekly Package."
- ³⁵ <http://www.forbes.com/sites/miguelhelft/2015/07/01/no-internet-no-problem-inside-cubas-tech-revolution/#39d73e0576c7>
- ³⁶ <http://www.cbc.ca/news/world/cuba-el-paquete-internet-wifi-havana-1.3527274>
- ³⁷ <https://ict4cuba.wikischolars.columbia.edu/El+Paquete>
- ³⁸ These include the harsh imprisonment of USAID contractor Alan Gross from 2009 to 2014, and the failed experiment of USAID's Twitter-like platform ZunZuneo created in 2010.
- ³⁹ <http://www.usda.gov/wps/portal/usda/usdahome?contentid=2016/03/0069.xml>

Center for International Media Assistance

NATIONAL ENDOWMENT FOR DEMOCRACY
1025 F STREET, N.W., 8TH FLOOR
WASHINGTON, DC 20004

PHONE: (202) 378-9700
EMAIL: CIMA@ned.org
URL: <http://cima.ned.org>



**National Endowment
for Democracy**
Supporting freedom around the world