1

The Past, Present, and Future of the Cuban Internet

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The first two sections of this introductory chapter[1]—summarizing the history of the Cuban Internet and its current state—aim to establish a baseline upon which subsequent chapters of the volume will build. The third section on the future of the Cuban Internet does not attempt to predict that future but describes emerging technology and suggests policy changes the Cuban government could make to take advantage of it. Before the advent of the Internet, Cuba was arguably the leading international computer-networking nation in the Caribbean. Members of Cuba's research and education community used pre-Internet networks for e-mail, document retrieval, and threaded discussions of a variety of technical and social topics. However, when Cuba finally connected to the Internet in 1996, seventeen other nations in Latin America and the Caribbean were already online. The U.S. embargo, the economic downturn after the dissolution of the Soviet Union (i.e., the special period), and political fear of free information (the so-called "dictator's dilemma") had delayed Cuba's connection.

Cuba adopted a limited-access Internet policy in 1996, and today the Cuban Internet is arguably the worst in Latin America and the Caribbean—minimal, slow, and unfree—in spite of Cuba being among the leaders in the region in terms of human development, a contradiction I address in some detail below. The economy has stabilized, restrictions on the importation of networking equipment have been lifted, and the Internet has been shown to be a tool for political control as well as free expression. However, bureaucracy and vested interests have developed within ETECSA (*Empresa de Telecomunicaciones de Cuba, S.A.*), Cuba's government-monopoly Internet service provider.

Cuban technology languished along with its policy. They relied on slow, expensive geostationary orbit satellites for international connectivity until

2013, when they installed an undersea cable via Venezuela and began open-
ing public-access *telepuntos* or "navigation rooms." Since that time, they have
added nearly seven hundred public Wi-Fi hot spots, digital home connec-
tivity to over seventy thousand customers, and most recently launched 3G
mobile access in December 2018, which was serving 1.8 million (35 percent)
of Cuba's 5.3 million mobile phone users by the end of January 2019. This was
followed by 4G trials in the first half of 2019. These series of government-
initiated stopgap measures are available in limited locations and use obsolete
technology to deliver inferior performance at prices that are high relative to
other nations and to Cuban incomes.

The government tolerates the offline circulation of a wide array of digi-
tal material downloaded from the Internet and transferred from person to
person via USB drives. Known popularly as *el paquete semanal* (the weekly
packet), this phenomenon is widespread and monetized, but its tolerance
is based on its compiler's strict self-censorship of political, religious, and
pornographic content (Henken 2021). This innovative grassroots digital
workaround has attracted wide media attention abroad (Kessler 2015; Fenton
2016; Parish 2018) since it reveals Cuba's where-there's-a-will-there's-a-way,
maker, DIY culture borne of scarcity and fueled by the population's scrappy
resolve.

If Cuba aspires to a truly modern Internet, they should consider what
they are doing today as providing an interim stopgap and plan to leapfrog
to next-generation technology and policy by 2025. Such a policy should be
designed to meet economic and social goals, not to maintain its telecom
monopoly, stifling bureaucracy, and lucrative revenue stream. I derive my
suggestions from considerations of both global and local trends in policy
and technology and Cuba's own human resources, values, and culture. Cuba
has fallen behind the world, but they are taking stopgap measures today and
could deploy next-generation technology in the future. Given political fear,
vested interests, and the Cuban government's often-impenetrable bureau-
cracy, next-generation policy will be a tougher problem. I will speculate on
that future policy and technology in the final section of the chapter, but first,
let's review the past and the present.

The Past

Before the Internet, companies like IBM and DEC (Digital Equipment Cor-
poration) used proprietary protocols to network their computers and the U.S.
government-built defense networks of identical computers (Press 1996d).
Later, X.25 and UUCP, open standards that allowed dissimilar computers

to communicate, were developed. In the 1980s, Cubans began using X.25 and UUCP networks for limited international communication. They used Russian X.25 networks for access to scientific articles and e-mail, but UUCP was more important. UUCP networking was central to communication within the nascent international networking community and Cubans used it for e-mail, file transfer, and Usenet News, a large, eclectic collection of global threaded discussions on technology, science, politics, culture, and many other topics (Mesher et al. 1992; Press and Snyder 1992). Usenet News Groups were user discussion forums, not sites dedicated to publishing news for the general public.

Four Cuban organizations had international UUCP links and were serving client organizations (Press 1996a; Press 1996b; Press 1996c):

- CIGB, the Center for Genetic Engineering and Biotechnology, served subnets in eight organizations with 950 active accounts. (Several users might share a single account).
- CENIAI, the Center for Automated Interchange of Information of the Cuban Academy of Sciences, served ten subnets with 732 active accounts.
- TinoRed served the 150 (at the time) Youth Computer Clubs around the nation and thirty-two NGOs with 413 active accounts.
- Infomed served the medical community with five hundred active accounts.

Note that in those days (the late 1980s and early 1990s), computer networking was just beginning and Cuba, with its large, well-educated population and fewer than three thousand accounts, was among the leading Caribbean nations. However, UUCP was an asynchronous protocol—data was transferred several times a day in batches, so interactive applications were not possible and X.25 was inefficient relative to TCP/IP, the protocol used on the Internet; and Cuba did not have a link to the Internet.[2] The U.S. embargo and Cuba's economic depression that followed the dissolution of the Soviet Union delayed their connection to the Internet and, in September 1996, when CENIAI established Cuba's first Internet connection (Press 2011a), seventeen Caribbean nations were already online (Crepin-Leblond 1996). Despite the U.S. embargo, Cuba's Internet link was to the U.S. National Science Foundation network under their International Networking Program for research and education networks in developing nations and provided by Sprint (Press 1996d).[3]

While Cuba was late to the Internet, it had experience with small TCP/IP networks within the nation and CENIAI Director Jesús Martínez, Carlos

Armas of CIGB, and others had been active in regional and international Internet organizations. Cuban networkers shared the values and enthusiasm of the international networking community, believing, correctly, that the Internet would profoundly affect individuals, organizations, and society (Press 2011a; Press 2015b).[4] Today, Cuba's nascent Internet developer and entrepreneur community is reminiscent of that optimistic time (Press 2015h).

Cuban officials also took note of the Internet and established an interministerial commission to determine Cuban Internet policy. The Cuban Communist Party Plenum of March 1996 may have been decisive. The meeting was held less than two weeks after President Clinton signed the Helms-Burton Act codifying the Cuban embargo into U.S. law for the first time and aimed at providing "assistance, through appropriate NGOs, for the support of individuals and organizations to promote nonviolent democratic change in Cuba" (U.S. Congress 1996). At the meeting, Carlos Lage, Executive Secretary of the Council of Ministers, spoke of the economic advantages of the Internet, but Raúl Castro, who was familiar with a well-known study of Cuban NGOs by Gillian Gunn, feared them (Gunn 1995). His view was that "glasnost, which undermined the USSR and other socialist countries, consisted in handing over the mass media, one by one, to the enemies of socialism" (Press 2011b). The Center for the Study of the Americas (CEA), perhaps Cuba's most important, influential, and innovative think tank of this period, was also shuttered in 1996 due to government fears of the growth of independent NGOs and civil society organizations (Pérez-Stable 1998; Giuliano 1998).

The hardliners prevailed, and, while internal TCP/IP networks were allowed, Internet access was strictly limited (Rohter 1996; Valdés and Rivera 1999). It is noteworthy that Fidel Castro allowed the hardline decision but understood the importance of the Internet and supported TinoRed and the Youth Computer Clubs (Press 2013c). However, two years later, TinoRed no longer served NGOs and Cuba had made little progress while other developing nations—notably China (Press et al. 2003)—forged ahead.

In the late 1990s, my colleagues and I developed a framework for assessing the state of the Internet in a developing nation along six dimensions: *pervasiveness*, *geographic dispersion*, *sectoral absorption*, *connectivity infrastructure*, *organizational infrastructure,* and *sophistication of use* (Press et al. 1998; Wolcott et al. 2001). Using our framework, we conducted a study of the Cuban Internet and in October 1997 ranked Cuba at our lowest level on five of the six dimensions (Press 1997; Press et al. 1998).

In the early 1990s, Cuba had fewer telephone lines as a proportion of population and GDP than any Caribbean nation but Haiti, and was closer

to the low-income nations in terms of infrastructure and services than the lower-middle group into which it fell (Press 1996). The dissolution of the Soviet Union and U.S. embargo exacerbated the deficiency, leading them to create ETECSA, a joint venture between the Ministry of Communications (MINCOM) (51 percent) and Grupo Domus of Mexico (49 percent). In April 1995, Domos sold 25 percent of their interest to STET International Netherlands, a wholly owned subsidiary of the Italian State Telecommunication Company. Domos defaulted on their capital commitment and lost their equity, leaving STET with 29.29 percent of ETECSA, the Cuban government 49 percent, and a coalition of banks the remainder. In 2011, Telecom Italia sold its share of ETECSA to a company called Rafin S.A., which the Central Bank of Cuba describes as a non-banking financial institution.[5] The International Telecommunication Union (ITU) describes ETECSA as "one of the last state telecommunication-sector monopolies" but that seems inconsistent with the attribution of ownership to Rafin and banks, raising questions about finance and decision-making authority at ETECSA (Press 2014d).

The Internet impacts commerce, education, entertainment, government, etc. in a nation, but it is shaped in turn by the values, laws, politics, and economy of that same nation. Society shapes infrastructure and infrastructure shapes society. While Internet access was limited, Cuban networking was (Press 1998b):

- Relatively noncommercial—the first four internationally connected networks dealt with science, education, biotechnology, and medicine.
- Geographically dispersed relative to other developing nations—Internet connectivity was only available in the capital city in twenty-nine of the forty-four African nations with Internet connectivity, whereas Infomed had a presence in every Cuban province and TinoRed was present in nearly every municipality.
- Focused intra-nationally, not internationally.

Because of political fear, the poor economy during the special period after the dissolution of the Soviet Union, and the U.S. embargo, global Internet access was limited. As a result, Cuba is far behind most of the rest of the world in Internet today.

The Present

Today, the Cuban Internet is arguably the worst in Latin America and the Caribbean—minimal, slow, and unfree. The ITU publishes an annual

Table 1.1. Cuban IDI and sub-index rankings

	2017	2016
IDI	137	135
Access sub-index	166	169
Use sub-index	151	143
Skill sub-index	62	57

Source: Devised by the author based on ITU 2018a, b and ITU 2017a, b, c.

information society analysis (ITU 2018a, b), which features an ICT Development Index (IDI) for each nation. The IDI is a composite of three sub-indices: *access*, *use*, and *skill*.[6] Table 1 shows Cuba's 2016–2017 rank among 176 nations (ITU 2017a, b, c).[7] Cuba's IDI rank dropped during the year and is the lowest in Latin America and the Caribbean. Cuba's *access* and *use* sub-indices are only slightly better than those of Haiti, which is last in the region. Those stand in contrast to the skill sub-index in which Cuba ranks sixty-second, sixth in the region after Chile, Argentina, Venezuela, Saint Kitts and Nevis, and the Bahamas.

The Cuban Internet is also considered *unfree* by Freedom House, which annually assesses nations' Internet freedom using a three-dimension index: obstacles to access, limits on content, and violation of user rights. Freedom House studies sixty-five nations and Cuba ranked sixty-first, fifty-ninth, and fifty-eighth respectively on these dimensions in 2018. Overall, Cuba ranked sixty-first and only China, Iran, Ethiopia, and Syria ranked lower (Freedom House 2018a). For a detailed discussion of the Cuba findings, see Freedom House's annual "Freedom on the Net" report on Cuba (2018b). This dismal record stands in stark contrast to Cuba's ranking in another annual report, the Human Development Report of the United Nations Development Programme (UNDP 2018a). The report centers on the U.N.'s Human Development Index (HDI). The HDI considers 145 indicators in computing a summary measure of achievements on their three key dimensions of human development: *a long and healthy life*, *access to knowledge*, and *a decent standard of living*. In 2014, the Cuban HDI ranked forty-fourth in the world among 187 nations and was second only to Chile in Latin America and the Caribbean (Press 2014c). In 2017, Cuba ranked seventy-third globally and had fallen to twelfth place in Latin America and the Caribbean (UNDP 2018b). Cuba remained constant as the rest of the world progressed.

The state of the Cuban Internet is far worse than one would expect in a nation with a relatively high UNDP Human Development Index. How might we explain the discrepancy? The historical impediments to the Internet in

1996 have eased. The economy has improved since the 1990s and the availability of Chinese equipment has eroded the impact of the embargo (Press 2015a). President Obama's attempted rapprochement between 2014 and 2016 (Press 2017g) included sending high-level delegations of U.S. telecom officials to Cuba (Press 2015g; Press 2016g; Press 2016d), making an historic state visit to Cuba (Press 2016d), and organizing a meeting with tech entrepreneurs during his visit, but little came of that (Press 2016b).[8]

While the historical impediments have diminished in importance, other factors have affected the discrepancy between the IDI and HDI. Cuba's health and education systems have increased HDI (and the *skill* component of the IDI) while other factors have impeded the development of the Cuban Internet:

- The lack of freedom discussed above.
- Bureaucracy and vested financial interests (Press 2014d; Press 2016i).
- Restrictions on self-employment of computer programmers (Camacho 2017; Press 2017c).
- Emphasis on the national intranet rather than the Global Internet (Press 2018; Press 2018e).
- Cuban reluctance to engage with U.S. IT companies both before and after President Obama's visit (Laughlin 2017; Press 2016b).[9]

Underlying all of this is Cuba's obsolete regulatory and infrastructure-ownership policy (Press 2016a). Based on high-quality data from 193 countries, the ITU's information and communication technology "regulatory tracker" uses fifty indicators organized across four pillars: regulatory authority, regulatory mandate, regulatory regime, and competition framework. Using these criteria, the ITU defined four ICT policy generations (G1-G4) up until 2018, after which there emerged a fifth generation (G5). Cuba is one of the twenty-eight remaining first-generation nations in the world (ITU 2017a; ITU 2017b, see figure 1.1 below):

- G1: Regulated public monopolies—command and control approach.
- G2: Basic reform—partial liberalization and privatization across the layers.
- G3: Enabling investment, innovation and access—dual focus on stimulating competition in service and content delivery, and consumer protection.
- G4: Integrated regulation—led by economic and social policy goals.
- G5: Collaborative regulation—collaboration among regulators aimed at digital policy design that accelerates digital transformation.