From Telex to eGovernment: The Birth of eRwanda

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It is hard enough to believe that in fifteen years any country could transform itself from one using telex to one implementing eGovernment, but it is even more outstanding for one that a little over a decade ago emerged from a genocide.

My first visit to Rwanda was in February 1992, two years before the genocide, when I was the newly appointed regional ICT officer for UNICEF's Eastern and Southern Africa Office, based in Nairobi. It was my first official country visit outside Kenya, but I had a general idea of what to expect.

The UNICEF Kigali office was using telex to communicate with the regional office and with headquarters, as we had not yet introduced fax. From start to finish, sending a telex took a minimum of two days: it had to be dictated to a secretary, typed, approved, retyped, rechecked, and finally sent, leaving behind a faded copy in the triplicate. This cumbersome communication system was not solely the fault of using technology from the 1850s but was also related to awkward business processes. Furthermore, these processes were not limited to the UN offices; they were de rigueur in most large organizations.

In terms of other technology, the office had two 286 Wang computers, each of them dual floppies, and they had some rudimentary software such as Wang word processing and Lotus 1-2-3. The use of computers, however, was limited to the few who had been trained, and, besides, the electricity was so erratic that a good old-fashioned manual typewriter was far more secretary-friendly. There was an international phone connection, but it rarely worked. I remember telling my secretary in Nairobi, "If Kigali calls, and I'm not in the office, keep the caller on the line, and find me, *find me, no matter where I am!*" I knew I would never be able to call them back.

Kigali itself was a sleepy, dusty little African town. No one paid any attention to it in the early 1990s. There were a few dirt roads going nowhere, hardly any vehicles on the road, and almost nothing going on. The office put me up at the Hotel des Mille Collines, which was, compared to the rest of the country, the lap of luxury. They even had their own generator.

During the next two years, between 1992 and early 1994, I began a program of bringing the country offices up to the UNICEF office technology platform. We rolled out some standard hardware and software, but not a local area network, because there were no qualified local staff to operate or maintain it. We recruited and trained a technician in basic hardware maintenance—things such as how to connect the monitor to the CPU, take off the cover, and blow the dust out once per month. We started some word processing and spreadsheet training for the secretaries

(no professional wanted to be seen typing in those days) and installed a simple financial accounting package.

During a visit in 1993, the senior program officer shared her fears with me that something political was brewing and that some staff were beginning to feel insecure. I thought to do two things: set up a high-fidelity (HF) radio system to Nairobi and request the Kigali office to send, via the biweekly pouch, a diskette with the financial data. By February 1994 we had both systems in place.

During any typical week in the regional office, nearly all of the eleven international professionals were traveling, including the regional director. During the first week of April 1994, I was the only international professional in Nairobi; everyone else was out on mission. Despite being the most junior of the professionals, I was officer in charge of the regional office on that awful day when I got a phone call from New York: something terrible had happened in Rwanda.

Immediately I called the representative of the Kenya country office, for he was an expert in emergencies. His first words were, "Why are *you* calling me? Where's the regional director?" I said I was OIC this week. His second words were, "Oh sh—!" and then, "Get your ass over to my office *now!*" I literally ran over there and he told me exactly what to do, in the order in which to do it. The Rwandan phone system was completely dead, so I activated the HF radio system and we connected to the program officer within minutes. Within thirty-six hours, UN security had evacuated all seven international professionals from Kigali and given them safe haven in Nairobi. In line with UN policy, local staff were left behind to their fate. Right after the evacuation, we set up a UNIX server just for Rwanda data, loaded the data from the diskettes, and reconciled the books up to about a week before the war began.

In Rwanda, there was a total collapse of society and complete destruction of electrical and telephone systems. There was also no water, for the pumps were not able to work without power. Food was scarce because the markets had failed and health clinics had closed. As many as a million people were killed, and perhaps another million maimed, physically and psychologically.

In July 1994, eight days after war ended, UNICEF needed someone to go there, salvage whatever equipment was left, set up the office again, load the

financial data, and establish communications ahead of the emergency aid response. I had no choice but to go and do what I had to do: establish computing and phone connections. I brought a Sat C with me (we couldn't get a Sat M in time) and my Toshiba 286 with a 1200 bps modem. Together with security, health, and water officers, plus canisters of Jet A1 fuel for the plane's return trip to Nairobi, we boarded a C-130 cargo plane to Kigali and hoped for the best.

What we found were the worst conditions I had ever experienced. The UNICEF office had been destroyed, but the World Bank office in the Soras building was still standing. Desperately needing a place to live and work, we used a crowbar to break into a side door and established ourselves on the ground floor. To say the place was filthy was an understatement. It had been a terrible hundred days of death and chaos without power, water, food, transportation, or communications—this was one deserted, dusty African town. The office was full of lice and rats. Most of the slaughtered bodies had been removed from the streets, but not all of them, and the smell of death was everywhere.

I had brought a suitcase of food with me, which the four of us quickly consumed. After that, we had nothing. Fortunately, several days later, UNICEF sent a truck down from Nairobi with 100 boxes of high-energy, high-protein biscuits on their way to the refugee camps. I was doubling as logistics officer, so I took two boxes of biscuits off the truck when it arrived and we lived on that for a week. About eight or nine days later, a contractor paid by UNICEF set up some catering, by which time we were in pretty bad shape. Someone gave me a liter bottle of water—drink it or wash with it? It was an easy choice. It was another eleven days before I got a pail of water (from a dirty pool) for a cold sponge bath. There were bathrooms in the building, but you can imagine what they were like without water to flush the toilets.

Security was also a terrible problem. Two weeks after my arrival, we numbered twenty-eight people in the office, all sleeping on the floor. I had brought a pillow and a sheet and was grateful for this small comfort, for no one else had a pillow. Once I entered the World Bank building in July, I scarcely left the compound. We lived there; we worked there. All night long, the militia rode their trucks back and forth along the streets, shooting semiautomatic

rifles into the air. For those who know Kigali, the Rwanda Patriotic Front (RFP) army camp then occupied the land where the Serena Hotel and Kigali Institute of Science and Technology (KIST) now stand—a five-minute walk from our building. Land mines could be heard going off near and far, often at night. We had a policy of no lights at all after dark, and we were deliberately quiet—so fearful were we that the army would detect our presence and enter the building. We were sitting ducks.

During the day, I tried to sort through the computers and get the Sat C working. Earlier, someone had gone around and picked up UNICEF's equipment, which had been thrown in the basement along with items from UNDP and the World Bank. They had been corralled and smashed together, an odd jumble of computer components, some cracked screens, a frayed cord here and there, a printer or two, boxes of confidential papers, and so on. One of the engineers hooked up a small generator and I got a telex machine powered up. Much to my surprise, the international telex network was still intact, but we couldn't find any punch tapes to use with the machine. After a day of fiddling with the old copper wires, an acoustic coupler, and my modem, I somehow connected my laptop to the telex and was able to send messages, composed in ASCII and sent at 50 bps. Miraculously, I managed to jury rig four computers and one printer from the pile of junk and pieced them together with little more than scotch tape and bubble gum.

Staff and contractors were arriving steadily and UNICEF began its emergency relief phase of operations. These people were on the front line every day, setting up refugee camps, ordering food and medical supplies, all the while desperately needing access to the computers, telex, Sat C, and HF radio, trying to figure out how to piece the relief program together.

I had originally planned to stay for two weeks. Four and a half months later, I returned to Nairobi and resumed my regular responsibilities. It was time to enter the immediate postconflict stage. We ordered new computers, preconfigured them with the standard software, and I returned to Kigali with a "LAN in a box." The phone was reestablished and we set up a batch email to Nairobi for forwarding to HQ and other locations.

At the same time, the UNICEF office began hiring new staff. Three of the former local staff had survived the war and returned to work, and we learned that seven others had been killed. I began a training program on ICT in 1995–1996 to get the staff up to speed with the new systems, but it was slow going. The scars were very deep, and computer training was no one's priority.

In 1997 I left Kenya and lived for two years in Botswana, from where I was recruited by the World Bank. After moving to Washington, D.C., I had no contact with Rwanda until 2001, when the Development Gateway Foundation (DGF) was established to use ICT as an enabling strategy to help poor countries reach their development goals and improve information and knowledge sharing. Two Rwandan visionaries, Minister Romain Murenzi and Ambassador Richard Sezibera, heard about the Gateway and approached the World Bank with their desire to become a "founding member" of the organization. The other founding members were all from developed countries and many bank staff were skeptical of the idea. First, founding members had to contribute USD 5 million to the DGF (although it was agreed this could be "in kind" and used exclusively within the country) so why did they want to be founding members? Second, could they allocate the required funds? Third, could they even connect to the Internet? At a meeting in headquarters, some senior staff scoffed at the idea but admitted that someone would have to go there to do an assessment—surely that assessment would prove it couldn't be done. I raised my hand and said, "I'll go, let's see what changes they have made in the past few years."

I returned to Kigali to perform this assessment in late 2001 and was pleasantly surprised at the progress since 1997. Not only was there a stable government with a strong and dynamic leader, but there was a great deal of construction going on and basic services were working. The country was more secure and there was improvement in various development indicators. The Rwandans had developed a Vision 2020 statement, which clearly articulated the goal of becoming a middle-income country within twenty years. The first NICI (National Information and Communication Initiative) Plan, which was in itself a major accomplishment, had been developed, KIST had been established, the National University of Rwanda (NUR) was offering an undergraduate degree in computer science, and there were impressive infrastructure improvements. I returned with a glowing

report and convinced the DGF management to give it a try.

No good deed goes unpunished, so the World Bank appointed me to be the team leader for the Rwanda Development Gateway Group, and in July 2002, an agreement was signed between the DGF/WB and the government, setting out a three-year program, valued at USD 5 million, all of which was to be from the government's own funds. The activities were designed to support the NICI Plan, and they were clearly centered on using ICT: establishment of a regional ICT training center at KIST; strengthening the GIS Center at the NUR; and creating a Rwanda Development Gateway Portal, which would target information for women, farmers, and traders.

Rwanda had all three programs off the ground by December 2002 and had employed seventeen staff members. Funding wasn't always forthcoming, but, despite this, the Gateway Group made considerable progress. At the same time, the NICI I plan (2000–2005) was being implemented, with the goal of transforming Rwandan society from one that relied primarily on agriculture to one that focused more on the knowledge and information economy. The plan was evaluated in June 2005, when it was widely acknowledged that there were funding gaps and a lack of institutional capacity to implement the programs because ICT skills were scarce. Despite these handicaps, the government was able to establish a government network of fiber optics to link the central government offices, set up LANs and hire ICT directors for the key ministries, establish some policies and standards, and train many Rwandans in ICT skills.

Notwithstanding significant advancements in ICT, many of the initiatives lacked cohesion and were less successful than the government had hoped. This was complicated by an influx of donor-funded development projects, many of which had ICT components but lacked a holistic approach. Compounding the complexity was a weak ICT coordination agency that had laudable goals but low capacity for implementation.

To address the capacity needs of the government, the World Bank approved a project in 2004 that had a strong emphasis on public sector reforms. The project included a component focusing on using ICT to lay the foundation for eGovernment by setting policies and standards, strengthening the

ICT coordination agency, funding ICT training and employment, and placing a strong emphasis on ICT planning and infrastructure. All the activities were in line with the Gateway project and the NICI Plan.

In June of 2005, His Excellency President Paul Kagame of Rwanda met the World Bank President in Kigali and impressed upon him his country's strong commitment to using technology for development. He requested that the World Bank fund an eGovernment project, to be called eRwanda.

The project takes a more holistic approach to the use of technology, building upon the previous actions and lessons learned. The eRwanda Project was submitted to the bank's board of directors in September 2006 and will focus on strengthening the government's effectiveness and internal systems, enforcing the country's ICT standards, improving service delivery and information dissemination through the use of ICT, and amplifying the physical infrastructure of the country, especially in rural areas. Innovative pilot applications will be developed, and it is envisioned that other development partners will also contribute substantially to ICT as part of their support to the country.

It is often said that Rwanda lost a decade because of the genocide. What a decade to have lost! The end of the twentieth century brought great progress in technology and global connectivity yet widened the gap for many countries that did not take advantage of the rapid changes. My analysis of the situation in the early 1990s was that Rwanda was about twenty years behind Kenya, the East African leader in ICT, and falling fast. At the turn of the century, Rwanda seemed only about fifteen years behind Kenya in ICT. Now, in the middle of 2007, Rwanda all of a sudden seems less than ten years behind Kenya. By 2010, if they continue on this trajectory, they should catch up or overtake their neighbor.

Why is this remarkable transformation happening? How did Rwanda change so dramatically from requiring two days to send a telex to embarking on a scheme to establish eGovernment? It is because of the leadership and vision of President Kagame, who continues to create the enabling environment for development, and to the on-the-ground leadership and can-do attitude of strong Rwandan individuals who believe that ICT is the right catalyst for dramatic change in their society. The government's stated goal is to transform their country from one

that is primarily dependent on agriculture to one in which information and knowledge are the drivers for growth. They have recognized that manufacturing and industry may not be their best route, for they lack natural resources and land for factories, yet they wish to capitalize on a young, energetic citizenry that is multilingual and forward-looking.

Looking to the information age as their future, they have taken bold action to move quickly in this new direction, by streamlining business processes to make government more efficient and effective in the process. This is their goal, and the development partners are committed to supporting their efforts. ∎