18 No Internet, No Problem

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While much has been said about Wikipedia's editors and how they work and interact, we seldom think of those who cannot easily access it—because of poor connectivity, high data costs, or outright censorship—yet still do.

It was on a Monday afternoon that I realized I could change the lives of four billion people. As a Wikipedian, this was a rather interesting proposition: almost fifteen years after the encyclopedia's launch, these represented the bottom half of the world—those we could not reach because they had no internet access—and yet we had made it our fundamental objective to bring knowledge to. We are now closer to the twenty-year mark, and though there has been some progress, the Wikimedia movement as a whole still hardly acknowledges offline access as a fundamental issue.

There are many reasons for this—starting with the fact that the Wikimedia movement has always been a movement of writers (and curators) rather than readers. In fact, I fully expect that at least one other contributor to this volume will raise the fact that Wikipedia's design and general user experience has hardly changed since it went live in late 2001. The website has pretty much become the Rolling Stones of the internet: yes, they're old, but they're still around, unlike these one-hit-wonder punks that were supposed to replace them. So why try to fix something that nobody notices is broken?

Fair enough. At least that's what one would say if they shared the general dogma that we are in the best of all possible worlds, and therefore, progress must be on the horizon. Conventional wisdom has it that we shall wake up one day and find it on our doorstep. Yet, if the past few years have taught me anything, it is that this kind of thing only happens because a couple of outliers took it upon themselves to make that delivery happen.

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Twenty years ago, much of the internet was on dial-up connections. Then came broadband. But for those who could not afford the former, the latter is not much help. The same goes for those facing increased censorship. For them and countless others, the solution has been found in the offline distribution and consumption of Wikipedia. The demand is enormous and has largely been ignored by the broader Wikimedia movement because it is, quite literally, disconnected from it. And for the foreseeable future at least, the issue is here to stay.

New World Hoarders

In 2016, I was sitting in my office at Wikimedia Switzerland, preparing the dreaded annual Funds Dissemination Committee (FDC) grant proposal for the Swiss Wikimedia Chapter. An FDC grant request is an interesting process in and of itself as chapters plan their activities for the coming year and request the corresponding funding from the Foundation. The committee itself was until recently made up of volunteers from the editor community, but its decision making is pretty opaque; anyone concerned with governance would probably raise an eyebrow at the prospect of having random strangers with no specific qualification distribute several million dollars of donors' money. But like Wikipedia itself, the process works much better in reality than in theory.

Quite a few of these programmatic activities rest on the shoulders and goodwill of Wikimedia volunteers. A good example are edit-a-thons, events where Wikipedians will teach wannabe Wikipedians (or the general public, depending on how the event is framed) how to channel their nerd potential for the common encyclopedic good. The chapter helps with booking rooms; provides an institutional point of contact for the host institution; and makes sure that snacks, drinks, and a friendly space policy are available (as well as the inevitable drum beating to publicize the event). But since the show will in the end be run by volunteers who sometimes have to prioritize their own life over evangelizing, each chapter is essentially promising things it is not entirely sure it can deliver. In spite of this, and yet again, something that does not make sense on paper does, in fact, prove itself to work remarkably well day after day after day (almost 7,300 of them and counting).

The key here is to promise things that are ambitious yet manageable ("*We will teach people how to edit!*"), are reasonably cost effective ("*with volunteers*

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to train them and $50 worth of cookies to lure them in"), and, what may be the hardest part, have an impact ("*We'll end up with more Wikipedians than we started with*"). As things often turn out, if everyone uses Wikipedia and finds it a fairly reliable encyclopedic resource, editor retention is a much, much harder task. I found out over time that people either have it in them or not. And if they do, they probably will learn to edit on their own, which can be complicated but not any more than, say, learning to ski; simply be aware that if you start to like it, your (social) life is likely to go dangerously downhill from there. Some will come and realize that there is no magic; that editing articles takes time, dedication, and potentially the willingness to argue over minute details for days or weeks at length.[1]

Chapters need to justify their existence, and organizing edit-a-thons is probably one of the lowest hanging fruits of community building. Another much touted example is GLAM (Galleries, Libraries, Archives, and Museums) relationship building—trying to convince institutions to share their art with the public—a much harder task than what one would expect. Many still find the prospect of sharing digital copies of their collections with the masses to be something that goes against their primary mission of telling said masses what to look at and in what order. Overall, every chapter and user group around the world offers some variant of these two avenues: either to bring new Wikipedians into the fold or to bring material that average Wikimedians couldn't produce themselves. For the past twenty years, the Wikimedia movement has considered that to "[give] free access to the sum of all human knowledge," it first had to accumulate it.

And then comes a black swan event, a game-changing opportunity so big, so unique, that you know that whatever metric is normally thrown at you has become irrelevant. Rather than scrounge for a couple of new editors here and there, rather than "freeing" images few would ever look at, this event told me that I should stop looking for content and content producers and instead start considering those in need of this content.

This black swan, in my case, turned out to be a small, wingless kiwi.

One Child, Two Fathers

Kiwix (with an "x") was born in 2006–2007, from two fathers who did not know each other at the time but had pretty much had the same idea—or rather, had made the same observation—at the same time: Wikipedia is a

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great resource, but not everyone can access it. The reasons are many but in the end boil down to the fact that there may not be any connectivity where the reader sits. They will not, therefore, be able to connect to and query the Wikimedia servers from their device. In the Wikimedia world, this simple statement is almost a conceptual breakthrough as most editors, by definition, are connected to the internet and enjoy a fairly decent level of connectivity.

When one is happily amassing the sum of all human knowledge, seeing it take shape and hearing increasingly positive feedback from people discussing it every day around them or in the news, life is a bubble of unending progress. The Wikimedia movement is infused with an infallible West Coast optimism that technology will ultimately catch up and solve everything: it is easy, almost natural, to be blinded to those who are not around or cannot interact and therefore have no voice. Wikipedia editors are not particularly strong on readers' experiences, but as far as addressing connectivity issues go, discussing these within the movement has often felt similar to discussing famine with people whose only lunch option is an all-you-can-eat buffet: it's a terrible thing, yes, please do keep talking while I get myself a second serving of Netflix.

The first "father" of Kiwix, therefore, had to be Renaud Gaudin, a French expatriate who had made himself a new life in Bamako, Mali. For him, and for Mali in general, the lack of connectivity in 2006 was almost a given (and to a great extent still is nowadays). But five years after its inception Wikipedia was picking up fame and volume, and Gaudin knew of it. His solution to bring the sum of all human knowledge to his fellow Malians was called Moulinwiki (from Moulin Rouge; every coder wants to be a provocateur, and in his rather conservative, barren environment, the idea of Parisian sophistication and decadence had quite a bit of appeal). The software acted as an offline reader for the Wikipedia article dumps, and most of the encyclopedia could be stored as a series of zip files on a DVD. Gaudin and his team initially caught the eye of the local US Agency for International Development office, who promptly decided to share a basic desktop version with the local Peace Corps members. The reception was good, but no systematic effort to update the content was made, and so the project never really went anywhere (or almost: a Syrian refugee—who certainly had never set foot in West Africa—reached out in 2019 to tell us how much of an avid user he was). But Gaudin had anyway moved on to

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the next iteration of the idea, thanks to a chance contact with Emmanuel Engelhart.

Engelhart is the other creator of Kiwix and also a French expat, living at the time between Germany and Switzerland (he would later move to Switzerland for good). The problem was somewhat different on his end; there was no immediate intention of helping poor kids get a better education, no international partner to work with, but something much closer to home as Engelhart's mother was living in the French countryside where connectivity was excruciatingly poor. He could not share with her the wonders of Wikipedia, which he had already started editing in 2003. And so he set out to work, almost at the same time as Renaud Gaudin did more than four thousand kilometers away, on a portable, offline version of Wikipedia. The technology, in his case, quickly came to rest on a novel compression system called openZIM, an improved and open source version of the proprietary (and deprecated) zeno format. The Kiwix name, for its part, was born out of a wiki-based play on words: wiki/kiwi, with an x at the end for good measure.

Like its African counterpart, Kiwix quickly started to attract interest—first in the free software community, then from more commercially minded folks. Paris-based search engine company Linterweb saw this as an opportunity to showcase its service to the Wikimedia community and agreed to help with the hosting and development. Five thousand DVDs, each with a selection of two thousand articles in English, were prepared. Only 250 had been sold after a year. The relationship quickly soured as Engelhart wanted to keep the Kiwix project as the free open source software project he had imagined; for him, any commercial offer had to be entirely separate. The partnership was formally terminated in a December 2008 announcement. Linterweb subsequently tried to launch a clone called Okawix (a name based on the almost eponymous Congolese giraffe; why such a fascination with exotic animals, no one knows), but without its main developer to give it direction, the project never really took off.

Things weren't so bad for Engelhart as before parting ways the owner of Linterweb had put him in touch with Renaud Gaudin. The two coders got along very well, so much so that Moulinwiki and Kiwix merged shortly thereafter. The project continued, now twice as strong at the core and attracting more volunteer developers from around the world. But as its popularity grew, so did its costs. Working as a Wikimedian in Residence at the Swiss National Library, Engelhart reached out to Wikimedia Switzerland

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asking for support (as converting Wikipedia dumps to a single openZIM file does take quite a bit more computing power than a personal computer can offer). Meanwhile, Wikipedia had kept its impressive growth, leaving DVDs unable to cope with the amount of information it presented, and so universities from around the world started to step in to provide free mirroring services for the increasing bandwidth load created by the ever-expanding size of ZIM files. In an ironic turn of events, the offline Wikipedia could now only be accessed by first downloading it (and therefore being online). The software was put in repositories and remained free as in speech as well as free as in beer. The project trudged along, pretty much like any other freeware, except that its main audience was offline and had almost no way of making it known that they enjoyed it. Almost.

Elephant, Meet Room

Then, around 2015, with the encyclopedia's fifteenth anniversary around the corner, things started to become interesting for everyone. Wikimedia Switzerland (or WMCH as shorthands go in the wiki world) had gone through a period of sustained expansion and had only recently in 2013 started to professionalize. It was still fragile and understaffed, and all hell nearly broke loose when the previous executive director quit almost overnight after personal tragedy struck. The Foundation was supportive—building personal relationships and having the squeaky-cleanest (dare I say Swiss) accounting books helped a lot to foster an understanding that things were under control—but San Francisco still needed to know what the impact of its previous grants was and had already started to reduce the amounts it allocated to its larger, older affiliates. With its already absurdly high quality of life, Switzerland's costs were compounded by WMCH's multilingual setup. The default option until then had been that every effort had to be duplicated in at least three, if not four, language versions (despite the fact that Italian speakers, for instance, only represent less than 5 percent of the country's population and even less of the local Wikimedia contributors). In the end, with new management in place (me), it was as good a time as any to sit back, find out what Wikimedia Switzerland was really good at, and where it wanted to go. The encyclopedia was turning fifteen; the chapter, ten—technically both teenagers, even if barely. Adolescence, we are told, comes from Latin *adolescere*—to grow up.

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Which programs worked, which did not? We knew we probably would have to cut some activities and that others could be improved. One can wonder why these questions had not been addressed earlier, but it is important to remember that back then nobody really knew how to recruit and grow contributors for a globe-spanning encyclopedia. It took five to seven years for chapters to professionalize—meaning that until then, the Foundation was relying on the same volunteers who offered and ran the programs to evaluate their impact. For free. In their spare time.

Interestingly, among all the activities the chapter supported, no one on either side of the pond had ever really questioned the value of Kiwix. Both San Francisco and Switzerland were hubs of ultra-connectivity, so maybe people felt a kind of guilt about it and figured they ought to provide at least token support for those around the world that did not have the "chance" to edit. Elsewhere, and in spite of growing evidence to the contrary, everyone in the movement was still assuming that it was every human being's ultimate destiny to be able to contribute to the sum of human knowledge. What *really* mattered, therefore, was how many community managers were needed to run edit-a-thons; how many partnerships could be signed with museums to transfer their collections to Wikimedia Commons; and how local chapters could help curate, improve, and feed the Wikimedia projects. Compared with all of these, supporting volunteer-run Kiwix with server costs only was a real bargain.

But the times, they were a-changin', and considering that several thousand dollars were nevertheless spent each year on a poorly understood project, we had to know what offline access really meant. Wikimedia Switzerland was paying to bring content to people we weren't sure existed. And if they existed and could connect to our servers, then why on earth would they need an offline Wikipedia?

Hello, World

The answer was only a phone call away placed one fateful Monday. According to Engelhart (and, more importantly, the server logs), there had been a little over eight hundred thousand (!) downloads of Kiwix over the year—and we were in September, meaning that there was almost a full quarter's worth of additional downloads still ahead of us. These numbers were for the desktop version alone; the Android and iOS versions of Kiwix hadn't

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been released yet, and a bulky hotspot was only starting to be distributed. Yet at the same time, Wikimedia Switzerland could consider itself successful if it had twenty or thirty participants coming to the edit-a-thons it organized at the National Library. The numbers simply could not be compared. It felt like we were in nineteenth-century California, digging for editor gold when the actual riches and impact had been all along in selling nails.

For someone with such success, Engelhart was pretty humble—or simply more interested in technical challenges than usage metrics, a common occurrence among free software enthusiasts. He had been in touch with a few organizations. But it did not take much digging around to realize that there was, indeed, a much broader demand for an offline version of Wikipedia. With a bit of hindsight, it is not particularly hard to understand why it would have the same appeal in unconnected areas as it had elsewhere. Because poor connectivity usually correlates with poor educational resources, it only makes sense that the appeal of a free encyclopedia should be even greater than in areas where there was at least some competition for pupils' attention. Whereas in the United States and Europe the project had to prove its value against venerable competitors such as *Britannica* and other established works,[2] in most of the world the comparison was literally between Wikipedia and … nothing.

And so Kiwix had users in sub-Saharan Africa—not only Mali, the early adopter; but also in Madagascar, with the Alliance Française; in Botswana, again with the ubiquitous Peace Corps; and in the Democratic Republic of the Congo, on the University of Kinshasa's internal network. The list goes on, and all of this happened without any sort of advertising or communication, just like Wikipedia never really had to advertise itself. We could make sense of these use cases as they broadly fit the initial idea—bringing knowledge to those in need and at minimal cost. In spite of all the reluctance, schools and libraries are logical partners and distributors for an encyclopedic project while international development organizations constitute a great vector and bring an additional veneer of respectability. Seeing them distribute Wikipedia, therefore, was a huge success but not an unbelievable surprise. It simply made sense. But then things got really interesting when we stumbled upon other use cases whose schooling was entirely different from anything we had envisioned.

The Yalu River acts as a natural border between China and North Korea. Because most of its finite resources are aimed at making sure that the

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demilitarized zone with South Korea is effectively impassable, North Korea's northern border is surprisingly porous. In fact, while official exchanges do happen between the two communist states, the region is also bustling with informal trade. Food, clothes, appliances; wherever there is demand, an offer will materialize. This includes material goods, of course, but also cultural ones such as movies, TV shows … and encyclopedias.[3]

Because it was free for the taking and redistributing, a few defector groups had started repurposing Kiwix for an entirely new mission—they would put the Korean Wikipedia, K-Pop songs, and South Korean movies onto flash drives, swim across the river (they later purchased a small carrier drone), and "lose" said flash drives on the streets. Curiosity would do the rest—who would not want to try to sneak peek at someone else's data? In a country where everything is propaganda, it appears that the best counter-propaganda simply is to present people with facts and let them figure it out for themselves.[4] Say what you will about reader friendliness, but Wikipedia is good with facts.

At the other end of the spectrum—and, quite literally, the other side of the world—the Cuban government has also been very officially using Kiwix to distribute its own version of Wikipedia, EcuRed. Because connectivity is a major issue across the country, every city and municipality on the island has its own state-sponsored Joven Club de Computación (Youth Computer Club), and every one of them is mandated to provide locals with a copy of the equally state-sponsored encyclopedia. But for its tone and editorial choices, it is very much a clone of Wikipedia (whose least neutral part, EcuRed notes drily, relates to "the revolutionary processes happening in South America").[5] Yet Kiwix is distributed without alteration, and accessing the free (as in speech) encyclopedia is only a click away, which people seem to happily do. To boot, an informal network called Paquete Semanal also circulates hard drives loaded with movies and offline copies of Wikipedia, which people can then transfer onto their own computer or phone for personal—and discrete—consumption.[6]

The list of unexpected deployments goes on and on and on. For example, a German merchant sailor who updates Wikipedia every couple of years when going home; Andean communities refurbishing discarded cathode-ray tube (CRT) screens for the local library to use as makeshift computers; Eritreans buying offline copies of the encyclopedia for a dollar from their local cybercafé so they can prepare their classes; and on, and on.

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Off We Go

Once we knew about these uses, it was hard to continue seeing Kiwix as a mere side project; a namesake organization was formally incorporated at the beginning of 2017 with the support of both the Wikimedia Foundation and Wikimedia Switzerland. The ambition is clearly to develop the software (now born a second time) a lot more aggressively: we estimate our current user base to three million—80 percent of which are in the Global South as opposed to more than 70 percent of Wikipedia's users in the Global North[7]—and we aim to double that number every year, hoping to approach one hundred million by 2023.

The connected, "developed" world is so well ordered and so increasingly online (as shown by the growth of cloud-based services) that we forget that the real world is still full of cracks where necessity is the mother of invention. Twenty years after the birth of Wikipedia, we are not so much living in a world of *have* and *have-nots* than in a world of *have it easy* and *have it harder*. I believe that Kiwix helps us move to this new paradigm and brings us closer to the idea of knowledge for all.

Four billion people—the bottom half of the world—still have no reliable access to the internet. While connectivity is improving, so are its challenges. Censorship is generally on the rise, and a neutral, independent encyclopedia is as much of a chance for some as it is a threat for others as Turkey and China's clampdowns on Wikipedia show. Simple economics will also always make it so that there will be places that are not worth being connected to the wider world; after all, it took nearly twenty years for Wikipedia to reach the richest, most connected half of our world. One way or another, and at least for the foreseeable future, offline access to Wikimedia content is here to stay.

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Notes

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