The Power of Offline Internet

Beyond the Binary of Connectivity

2024

OFFLINE
Internet Consortium

Acknowledgements

About this Report

This report, commissioned by the Offline Internet Consortium, features research conducted and written by Nichole Saad from the Open Learning Collective. Vasanthi Hargyono contributed the design and data visualization.

The methodology underlying the research for this report was designed to ensure a thorough analysis of the current landscape and future potential of Offline Internet. It included an extensive desk review that examined the context and need for Offline Internet, the latest technological innovations, relevant policies, and guiding frameworks. This review also covered a detailed stakeholder analysis to understand the various perspectives and contributions towards Offline Internet.

Additionally, the research incorporated a series of interviews to gather qualitative insights and deepen the understanding of the issues at hand. These interviews were conducted with 17 members of the Offline Internet Consortium and 6 external stakeholders, including representatives from organizations with aligned missions, policymakers, and technology developers. The interviews were semi-structured, allowing for both depth and flexibility in responses, and were analyzed using the constant comparison method, to identify key themes and patterns in the data.

This report aims to provide a comprehensive overview of Offline Internet as a key innovation in the quest for universal and meaningful connectivity, offering strategic insights and actionable recommendations for stakeholders at all levels.

Contents

Executive Summary

The report "Recognizing the Power of Offline Internet: Beyond the Binary of Connectivity" delves into the transformative potential of Offline Internet solutions in bridging digital divides and enhancing universal and meaningful connectivity. This report provides a comprehensive analysis of Offline Internet technologies, their impact, and strategic recommendations for stakeholders.

Chapter 1 provides an overview of the persistent digital divides impacting global connectivity. It highlights the disparities in internet access between urban and rural areas, genders, and different age groups, emphasizing the complexity of the digital divide beyond mere access to devices and the internet. This chapter is essential for those seeking to understand the nuanced challenges of digital inclusion. Skip to **page 9** if you want a detailed examination of the global connectivity landscape and the factors contributing to digital exclusion.

Chapter 2 explores global frameworks for universal connectivity, and proposes a complimentary framework that outlines the role that Offline Internet plays in contributing to universal connectivity goals. It highlights the key components of meaningful connectivity, including content availability, digital skills, hardware access, software usability, and supportive policies. This chapter is significant for those interested in the qualitative aspects of connectivity. Skip to **page 18** if you are looking for a framework to assess and enhance digital inclusion efforts comprehensively.

Chapter 3 showcases the substantial contributions of Offline Internet initiatives across various domains, including content curation, digital skills development, hardware innovation, software deployment, and policy advocacy. It provides case studies and examples of successful Offline Internet initiatives that have bridged connectivity gaps in underserved communities. This chapter is indispensable for those implementing digital inclusion projects. Skip to **page 31** if you want to explore practical examples and the tangible impacts of Offline Internet technologies.

Chapter 4 emphasizes the role of Offline Internet in setting a new standard for connectivity. It discusses how Offline Internet contributes to digital inclusivity by ensuring that content is accessible, culturally relevant, and usable without continuous internet connectivity. This chapter also highlights how different stakeholders, including educators, technologists, policymakers, and community leaders, can contribute to the development and implementation of Offline Internet solutions. Skip to **page 51** if you want to understand how Offline Internet can redefine connectivity standards and ensure equitable digital access for all, while also learning how you can get involved in these efforts.

Offline Internet is a vital component of global digital inclusion. To reach universal connectivity goals, there needs to be increased investment, robust impact measurement, and policy support to scale Offline Internet initiatives. This report's insights and recommendations aim to foster a diverse ecosystem of connectivity options that empower all communities to thrive in the digital age.

Key Messages

There is an urgent need to address global digital exclusion: The persistent global digital divide, driven by an array of social, economic, and political factors, underscores the critical need for innovative approaches to ensure broad and meaningful internet connectivity.

Offline Internet redefines connectivity: The report underscores that connectivity should not be viewed in binary terms but as a spectrum, promoting a model where access to digital content is possible even without continuous internet connectivity, ensuring that knowledge and resources are available to everyone, regardless of their geographical or economic status.

We can bridge digital divides with innovative solutions: Offline Internet initiatives effectively bridge critical gaps in connectivity by offering innovative solutions like digital libraries and offline-first software, ensuring that educational and informational resources reach underserved and remote communities.

Localized content and offline access facilitate inclusion: Offline Internet solutions support communities by facilitating the creation, curation, and distribution of culturally and linguistically relevant content. This approach boosts digital literacy and ensures that communities have the tools to engage fully with digital content, even in the absence of stable internet connections.

Hardware and software innovations need to be universally accessible: The development of accessible and affordable hardware solutions alongside offline-first software is vital for maintaining functional and continuous access to educational content, irrespective of internet availability.

We must advance policy and infrastructure for sustainable connectivity: The integration of Offline Internet strategies into broader digital inclusion policies and infrastructure development is crucial for fostering sustainable connectivity and ensuring equitable access to digital technologies.

Introduction: Offline Internet puts knowledge within reach

In Ghana, a significant challenge exists—many schools are detached from the digital world due to prohibitive costs and limited infrastructure. The digital divide not only restricts access to information but also limits educational opportunities for numerous students.

Mayama Opare and Christine Marinho in an article for Youth Journalism International wrote,[1]

> *"In my school, the only access to the internet is the Information, Communication and Technology laboratory which is used once a week. Even then, the connection is not stable….Without the internet, students are also cut off from news about our country and the world,"*

They continued,

> *"There is no difference when comparing the life of a prisoner to that of a student in a boarding school. They all have restricted lives."*

Ruby Damenshie-Brown, an Open Knowledge advocate in Ghana, understood the lack of internet access in schools across her country wasn't just a minor inconvenience; it was a barrier that stifled the curiosity and potential of young minds eager to learn and connect with the world beyond their classrooms.

In 2019, Ruby's path intersected with an initiative that promised a sliver of hope—Kiwix for Schools. She learned about the project from Maxwell Beganim, a community volunteer who had begun installing Offline Internet resources in schools in Kumasi, in the Ashanti region of Ghana. Inspired by this effort, Ruby who had newly joined the Open Foundation West Africa, a non-profit organization supporting free knowledge initiatives, saw a chance to make a significant impact by helping this program scale across Ghana. She envisioned a Ghana where

every student could access the wealth of human knowledge, irrespective of their internet connectivity.

Together they launched the pilot initiative into a nationwide program. The model was simple yet revolutionary: use local volunteers to install digital libraries on school computers, allowing students to access educational content offline. This approach circumvented the need for internet connectivity, bringing resources like Wikipedia and other educational sites directly into classrooms, all stored on computers using simple pen drives. It allowed students to access previously inaccessible educational resources for free without having to worry about the cost of data.

As Ruby traveled across the country supporting these training sessions, she witnessed firsthand the transformation in schools. Students who had never clicked on a hyperlink were now browsing through vast articles and resources, discovering information that was once out of reach. Teachers, initially skeptical, began to see the value in the offline resources, even integrating them into their own research.

Ruby's story with Kiwix for Schools is more than just a tale of technology implementation. It's a narrative about breaking barriers, empowering educators, and transforming students' lives through access to information. Her journey illuminates the profound value of offline digital content in making education more inclusive and accessible.

By providing a gateway to a world of information without the need for continuous internet access, Ruby's work with Kiwix for Schools has opened new educational opportunities for students across Ghana, ensuring that knowledge remains within reach, regardless of their geographical or economic circumstances.

Ruby's story is compelling, yet not unique. Despite the growing internet penetration, digital divides still exist, calling for innovative solutions. In 2024, the Offline Internet Consortium began an endeavor to better comprehend these divides and understand how its members are helping to bridge them. We share our findings in this report, delving into the reasons behind the persistence of digital divides and how Offline Internet initiatives, like Kiwix for Schools, serve as far-reaching interim **solutions that remain relevant even when universal connectivity is achieved.** We propose a new framework for understanding and evaluating these efforts. We demonstrate that Offline Internet not only increases access to digital content and experiences but also provides individuals with more choices regarding when and how to connect to the internet. We argue that **it's time to acknowledge the power of Offline Internet.**

Navigating Digital Divides

Key Messages

Digital divides persist globally and impact access to education and information: Despite advancements in global connectivity, significant digital divides remain, notably in rural versus urban areas, among genders, and across different age groups, thereby hindering equitable access to digital resources and educational opportunities.

Enhancing digital equity requires localized and context-sensitive approaches: Addressing the digital divide involves more than just providing internet access; it requires delivering contextually relevant content that resonates with local cultures and languages, ensuring that the benefits of digital access are universally and meaningfully felt.

Digital well-being is integral to digital equity: As digital technologies become ubiquitous, ensuring digital well-being is crucial. This includes managing the risks associated with increased connectivity, such as data privacy and online safety, especially for vulnerable populations.

Offline Internet solutions bridge connectivity gaps: Innovative Offline Internet initiatives demonstrate the potential to overcome barriers posed by inconsistent internet access by providing offline digital libraries that enhance educational inclusion and accessibility.

Offline Internet should have a role in shaping future connectivity standards: Offline Internet not only offers immediate solutions to connectivity challenges but also provides a foundation for rethinking how digital services are delivered, particularly in under-served regions, thereby contributing to long-term digital equity and literacy.

Half the world is not meaningfully connected to the internet

In the seventy-eighth session of the Second Committee of the United Nations General Assembly on 6 October 2023, discussions centered on the escalating digital divide between developed and developing nations and its repercussions on global progress towards the Sustainable Development Goals (SDGs). Angel Gonzalez Sanz of the United Nations Conference on Trade and Development highlighted in his introduction of the Secretary-General's reports that despite a global connectivity rate of 63%, least developed countries have only a 27% internet usage rate, risking permanent economic disparity dominated by a few technologically advanced economies.[2]

A simple definition of "the digital divide" is the unequal access to digital technology—the gap between those who have access to devices and the internet, and those who do not.[3]

Yet, the full story is much more complex. There are multiple digital divides including between those in rural and urban areas, between men and women, and between generations of users. Moreover, the reasons for these divides and the needed solutions are not one size fits all.

Despite **63%** of **global connectivity rate** the internet usage rate in **least developed countries** is only **27%**

it risks **permanent economic disparity** dominated by a few technologically advanced economies

"The unconnected in some areas in the world are a majority, not a minority, which creates cultural and social divisions."[4]

Andres Leon-Geyer, Pontificia Universidad Católica del Peru – PUCP[4]

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In the least developed countries, the gender digital divide remains severe, limiting women and girls from fully participating in increasingly digital societies. In 2023, the ITU reported that only 20% of women in low income countries used the internet as compared to 34% of men.[5]

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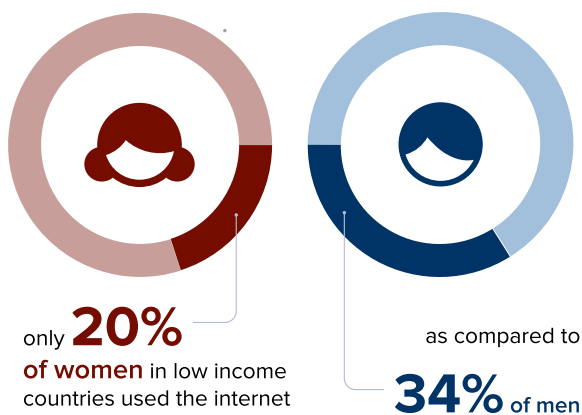
An interview with one OLI Member shed light on how even concerns about physical safety impact women and girl's ability to access the internet. While expressing concern about the availability and location of internet access points they said,

> "
> *Especially for young girls and women who don't want to go out at night time. You know, they're tasked with filling the water and bringing it home or going to the toilets at night time in some of the townships or walking to the access point; you have to walk by foot to that access point to do your homework.*
> *And so why is that the case?*
>
> **Why don't we start small with mesh access points and put the hotspots where they want and have their network?**

Concerns for physical safety are only one of the many factors causing the gender digital divide. According to GSMA, cost remains the greatest barrier to gender parity in access to the internet.[6]

Young people are also more likely to be online with almost 80% of youth using the internet in 2023, as reported by the ITU.[7] This is 14% more than the rest of the global population. In low income countries, young people are almost twice as likely to use the internet than other populations, even where overall internet penetration remains low.

While this is a positive signal for youth, older populations face digital exclusion. The "gray digital divide" as described by Mubarak and Suomi in a 2022 article results in dangerous isolation and prevents older people from accessing vital health services.[8] Older citizens need supportive communication to raise awareness, and digital skills training in order to fully access the internet.

Finally, it is important to discuss the wide usage gap between those in urban and rural areas. While worldwide 81% of people have access to the internet, in rural areas that number drops to 51%.[9]

Globally
81% of people in **urban areas** have access to the internet

in **rural areas** it drops to
51%
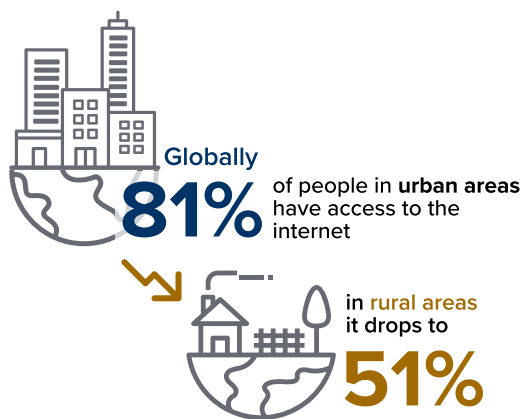
These disparities are exacerbated by other factors. In low income countries, 47% of people in urban areas have access to the internet, as opposed to just 17% in rural areas.[10]

urban	**47%**
rural	**17%**
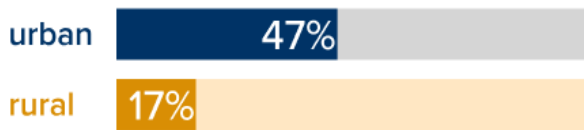
Referring back to the important discourse at the UN General Assembly, the committee sessions called for a concerted effort to cultivate local innovation ecosystems in developing countries, providing the necessary knowledge resources and creating supportive institutional environments. This approach is intended to mitigate social divides exacerbated by unequal technology diffusion.[11]

We need to shift focus from the technology itself to the specific problems that the technology is intended to solve

The committee's call highlights a necessary mindset shift about how to design, implement, and measure the impact of technology—a focus on the problems technology is intended to solve rather than on the technology itself. This idea is also emphasized in the 2023 Global Education Monitoring Report: Technology in education – A tool on whose terms? It states there is not enough data on technology's impact on learning outcomes to justify the investment over other solutions.[12] Keeping schools connected in poor countries is estimated to cost as much as 1 billion dollars per day. The report's corresponding campaign

#TechOnOurTerms calls for decisions about technology in education,

> *...to prioritize learner needs after assessment of whether its application would be appropriate, equitable, evidence-based and sustainable.*[13]

For true digital equity, content needs to be structured and contextualized in locally relevant ways

Content online is far from relevant to those already connected. Data from Wikipedia highlights the stark divide in who creates information and what perspectives are centered, with the 2020 Community insights report stating that 87% of Wikimedians[14] identify as male, and nearly half live in Europe and one-fifth in North America.[15] This means the majority of contributors to the largest, most viewed source of knowledge in the world represent only 10% of the global population.

87% of Wikimedians identify as **male**,

nearly half live in Europe

1/5 live in North America

source: 2020 Community insights report

this means

only 10%

the majority of contributors to the largest, most viewed source of knowledge in the world represent **of the global population**

According to Allmann and Sengupta,

> "Despite the very real impact of (uneven) access on the digital divide, inequality on the internet is about much more than having an internet connection…
> The tremendous growth of the internet over the past decade has brought more diverse people and communities online, and access statistics reflect this reality.
>
> **Yet, knowledge on the internet—and the people and institutions that make up the digital access industry—does not look like us: women, people of color, people from the global South**."[16]

Universal and meaningful connectivity needs to be about more than just the ability to connect to the internet. Individuals need digital content and experiences that are relevant, localized, available in languages they understand, and that convey the views and experiences of the global majority to the rest of the world. Allmann and Sengupta pose the question,

> ## "What would a human right to the internet look like, beyond access?"

We need a universal connectivity framework that recognizes knowledge justice and designs innovations that solve for these power imbalances.

In interviews, one OLI member expressed the need for more local knowledge representation,

> *If we give disconnected communities the platform to actually contribute to Offline Internet projects, I think it will actually make local information or knowledge to be accepted worldwide, because some knowledge is embedded in specific communities. So if you can take that project to a community, maybe in the rural areas, they want to share their culture and practices.*

Digital well-being should be included in our frameworks for digital equity

Access to the internet is not always a positive experience. The United Nations Sustainable Development Group warns,

> "**The pace at which technology is growing is faster than our current governance systems can cope.** *New technologies, turbo-charged by risks posed by the increased and unchecked use of Artificial Intelligence (AI) can easily drive loss of data privacy and escalate risks of online harm, spreading online violence and hate speech along with mis and disinformation.*"[17]

The rapid advancement of technology has brought about a dilemma that parents, educators, and industry giants are grappling with: How much technology use is too much? Research published in early 2023 demonstrates that there is still no consensus on a definition of digital well-being, nor effective ways of measuring digital well-being.[19]

It is important to acknowledge the wide variation in challenges related to the balance between digital literacy and digital well-being. Factors such as access to resources, usage patterns, and skill levels contribute to digital inequalities, which are often the focus of programs aimed at bridging the digital divide. In contrast, research on policies and practices related to the social and emotional skills necessary for digital well-being is limited.[18] Understanding this contrast is essential for directing targeted investments and interventions that address the unique needs of different contexts.

When discussing digital well-being, several interviewees advocated for the value of offline options, arguing they shouldn't be viewed as secondary to online access. They highlighted issues connected with internet use, including violence against women and the over-sexualization of youth.

They firmly contended that offline information allows individuals greater control over their content, a critical consideration in an era where digital data can be tampered with and exploited.

Digital equity is not only about providing access to technology and the internet, but also educating people on how to use these tools safely and effectively

The role of digital skills in ensuring universal and meaningful internet access, as well as digital equity, underpins the challenges discussed earlier. The barriers faced by new technology users should not be underestimated. An ethnographic study in 2011 involving 79 participants with low literacy levels and no computer experience from India, the Philippines, South Africa, and Kenya uncovered numerous usability issues with existing text-based interfaces.[20] These problems included **difficulties with hierarchical navigation, soft keys, scroll bars, non-numeric inputs, and terminology.**

The International Telecommunications Union (ITU) views digital skills as a central element for enabling universal and meaningful connectivity. They stated,

> *"An important barrier keeping people from going online or fully benefiting when they are online is a lack of skills. Meaningful use of the Internet requires that people are digitally literate."[21]*

However, due to the complexity and restrictions of this "connectivity enabler," the ITU does not provide measurement or indicators for digital skills as part of the ICT Development Index, a subject further explored in Chapter 2.

Both information literacy and digital literacy are vital skills that people develop over time. Simply providing internet access is insufficient. With the rapid advancement of technologies, internet newcomers barely have time to acquire basic skills before they have to adapt to new technologies. The inequality in access to opportunities for developing these skills contributes to the digital divide.

Solutions that assist individuals in developing the necessary skills to use technology are pivotal to efforts promoting universal and meaningful connectivity. They also represent key program areas for many advocates of Offline Internet.

Thus it is clear that while there has been progress made towards universal connectivity, there is still much work to be done to make sure that everyone has the ability to connect in safe, meaningful ways regardless of age, gender, ability, or geographical location. In the next section, we will take a closer look at Offline Internet and the Offline Internet Consortium's efforts to address these issues.

Offline Internet Provides Solutions That Address Digital Divides

The Tempe Declaration for Offline Internet

Since the early days of the internet there have been efforts to reach people without access to digital content and experiences. Indeed, efforts to reach those without access to information date back far beyond the digital revolution to times when librarians like Mary Lemist Titcomb built book wagons to deliver knowledge to individuals in the rural countryside. Recalling her efforts, Mary said, "No better method has ever been devised for reaching the dweller in the country. The book goes to the man, not waiting for the man to come to the book."[22] It is fitting then, that librarians gathered other academics, developers, program leaders, and advocates to come together and support the digital equivalent of "bringing the book to the man" through Offline Internet solutions.

At their first gathering in 2018, the participants representing 15 organizations issued the "Tempe Declaration."[23]

> The "Tempe Declaration" is a call to recognize Offline Internet solutions as
>
> *"A key step towards enabling access to and mastery of digital information and education, as well as preparing users to participate fully in global communications."*[24]

They agreed to form the Offline Internet Consortium (OLI), and facilitate knowledge sharing, collaboration, and advocacy for Offline Internet.

The participants also framed the "Tempe Principles," committing to open source tools, championing copyrighted material sharing, and engaging underserved communities as partners. They emphasized working with communities in remote locations, post-conflict situations, refugees, and those without economic or political internet access.

How does the Consortium define Offline Internet?

Offline Internet comprises innovative **hardware** and **software** solutions that enable access to a wide array of digital content without the need for continuous internet connectivity. This includes tools like microservers that create local WiFi hotspots where users can browse content freely without data charges. It also involves the **curation of relevant digital materials**—ranging from videos and e-books to complete websites—tailored to meet the specific needs of disconnected or underserved populations. Such technology is useful not only in conventional settings but also in areas where connectivity is restricted for security or policy reasons like prisons.[25]

Offline Internet democratizes information access, providing educational and developmental resources to regions where traditional internet connectivity is unreliable or non-existent. It supports **policies** related to digital rights and freedom of information, allowing users to connect to digital content even when these rights are restricted.

By facilitating the use of digital resources in these settings, Offline Internet helps foster **digital skills** and prepare communities for future integration into the global digital economy. This preparation is essential for equipping individuals with the skills needed to navigate and thrive in the era of the Fourth Industrial Revolution, where digital literacy is increasingly synonymous with educational and economic opportunity. Additionally, the ability to update content when connectivity permits ensures that the information remains current, maximizing the utility and relevance of the content provided.

In the following chapters, we'll further explore how Offline Internet contributes to frameworks for universal and meaningful connectivity, showcasing how it helps get us closer to a connectivity "gold standard" than the internet currently is, demonstrating how Offline Internet helps everyone have a better digital experience.

Framing Connectivity

Key Messages

Universal and meaningful connectivity enhances global digital participation: As defined by international organizations, universal and meaningful connectivity aims not only to provide global internet access but also to ensure that such access enriches lives, fostering safe, productive, and satisfying online experiences.

Achieving connectivity requires diverse strategies: There are varying approaches to achieving universal and meaningful connectivity, including leveraging existing technologies, exploring decentralized solutions like community networks, and emphasizing the role of different stakeholders from government to the private sector in enhancing internet access.

Offline Internet is complementary to univeral connectivity frameworks: The Offline Internet Consortium proposes the Offline Internet Framework For Meaningful Connectivity, which focuses on providing digital access through innovative hardware and software solutions that do not rely on continuous internet connectivity, thus addressing gaps in traditional internet infrastructure.

Progressive approaches to digital inclusion involve Offline Internet: The proposed framework details a spectrum of connectivity that includes assessing and enhancing content availability, digital skills, hardware access, software usability, and supportive policies to ensure comprehensive digital inclusion, especially in regions with limited or unreliable internet access.

Offline Internet is aligned with global connectivity goals: A new framework aims to align with broader global initiatives for digital inclusion by offering essential offline resources and services, preparing communities for full digital participation, and advocating for policies that support universal access to meaningful connectivity.

Photo Credit: Sarawak State Library. Photo taken in Telok Melano, Sarawak during testing of Pustaka in a Box solution for use by the local community.

Definitions of Universal and Meaningful Connectivity

As global entities, nations, and local communities alike scramble to keep up with an ever evolving digital landscape, frameworks for understanding universal connectivity have emerged among global organizations like the Alliance for Affordable Internet (A4AI)[27], the International Telecommunications Union (ITU)[28], and the Internet Governance Forum[29], highlighting the acute need for internet connectivity that is both *universal* and *meaningful*. This shared vision focuses on not just providing internet access to every corner of the globe but ensuring that such connectivity enriches lives, fostering safe, satisfying, and productive online experiences. All entities agree that for connectivity to be impactful, it must transcend basic access, addressing both the breadth of coverage and the depth of user engagement with high-quality connections.

These organizations emphasize various aspects of what constitutes meaningful connectivity. A4AI and ITU, for instance, stress the quality of the internet experience, advocating for

> **All entities agree that for connectivity to be impactful, it must transcend basic access, addressing both the breadth of coverage and the depth of user engagement with high-quality connections.**

specific benchmarks like minimum download speeds and the necessity of devices equipped with full keyboards to enhance usability and productivity. Meanwhile, the Internet Governance Forum shifts the focus towards the social and economic equity of internet access. It champions a user-centric approach that integrates digital access with broader social issues, aiming to bridge the digital divide by aligning connectivity initiatives with efforts to address social and economic inequalities. This holistic view underscores the need for internet access to be affordable, inclusive, and capable of supporting diverse societal needs.

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However, the path to universal and meaningful connectivity is not without its divergences in strategy and implementation. While some organizations advocate for leveraging existing technologies and infrastructures, others call for more innovative and decentralized solutions like community networks. The role of various stakeholders also differs across frameworks, with some emphasizing government responsibility in policy-making and infrastructure development, and others highlighting the private sector's role in driving innovation and investment.

> Despite these differences in approach, the overarching goal remains clear: to create a globally connected society where internet access is not only universal but profoundly transformative, enabling individuals across different socio-economic backgrounds to fully participate in and benefit from the digital economy.

As a result of the advocacy for a universal connectivity framework that emphasis the need for meaningful connectivity, the International Telecommunication Union's (ITU) developed a concept of meaningful connectivity that is measured by the Information and Communication Technology Development Index (IDI).[30] This index gauges the extent to which a country's connectivity is both universal *and* meaningful. The two dimensions of Universal and Meaningful Connectivity (UMC) are that it should be accessible to all and provide meaningful benefits in areas like affordability, infrastructure, skills, and safety.

The IDI utilizes indicators for both pillars based on quantifiable metrics primarily from official sources. Universal connectivity is measured by indicators that measure individuals and households using the internet and the number of mobile broadband subscriptions per 100 individuals. The meaningful connectivity pillar measures mobile and fixed broadband

Pillar 1:
Meaningful Connectivity
measures the quality of a country's digital infrastructure

ITU's Pillars of Internet Connectivity

Pillar 2:
Universal Connectivity
measures the extent of internet usage and digital inclusion in a society
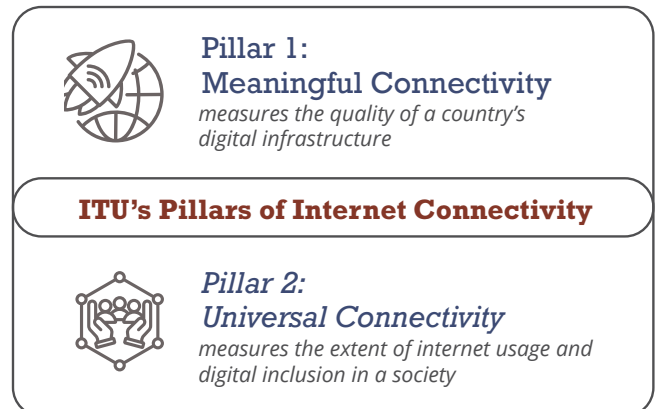
internet traffic, the coverage of 3G and 4G/LTE networks, data consumption, and the number of individuals in a population that own a mobile phone. The framework also assumes that these measures indicate that individuals have the skills to go online and feel safe enough to do so. There are no specific measures on digital skills or online safety.

The IDI's approach provides an adequate understanding of a country's digital landscape. It releases new data biennially, providing consistent updates on the progress and development of digital connectivity. As of 2023, this data covered 169 economies worldwide, providing a broad perspective on global digital inclusion. However, it does not paint a full picture of what many would consider "meaningful connectivity." It defines some areas as out of scope for this framework, as we explore in the following section.

Exploring the Key Areas Identified as 'Out of Scope' by ITU's Connectivity Framework

While the ITU framework is groundbreaking in assessing universal and meaningful connectivity, it defines as "out of scope" some key areas.[31] These 'levers', 'catalysts', 'content and services', 'applications', and 'impacts' may not be directly incorporated into the ITU's framework, but they play a pivotal role in shaping our digital future. Here's why:

'Levers' are areas where transformative change can be initiated. These include tools such as investment, policies, and regulation that can be used to enhance connectivity levels. By considering a wider range of potential interventions and solutions, we can foster an environment conducive to ubiquitous and meaningful connectivity.

'Catalysts' refer to broader factors like economic growth and technological innovation that drive improvements in connectivity. Acknowledging these catalysts means recognizing a multitude of factors that can improve the quality of connectivity, going beyond the traditional digital scope.

> **"The fact that these aspects are beyond the scope of the IDI does not mean that they are not important. They are and need to be studied in conjunction with the IDI for a fuller picture."[32]**
>
> *ICT Development Index 2023*

'Content and services' act as a magnet that draws people to connect. The more relevant and user-friendly they are, the more likely people are to connect. Their influence extends beyond the direct effect on connectivity quality and embraces aspects such as user engagement and digital inclusion.

'Applications', the different online activities people engage in, offer a wealth of insights into user needs and habits. A more expansive understanding of how people use connectivity can inform more effective and user-centric design of digital services and infrastructure.

Lastly, the *'impacts',* of connectivity, which encompass societal,

environmental, and economic outcomes, are critical considerations. These impacts are an essential measure of the value of connectivity, influencing people's lives and the sustainability of our digital future.

These factors, while not in the ITU's framework, are essential to the digital landscape. By understanding and addressing them, we can promote universal, accessible, and meaningful digital connectivity. The ICT Development Index 2023 itself states, "The fact that these aspects are beyond the scope of the IDI does not mean that they are not important. They are and need to be studied in conjunction with the IDI for a fuller picture."
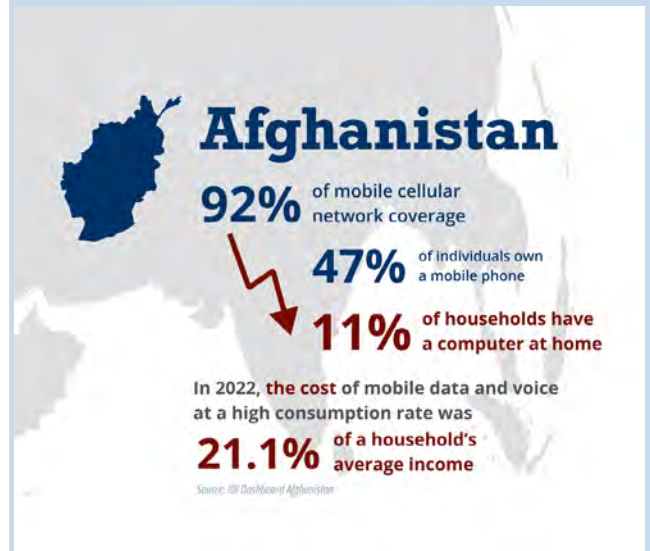
> Neither the IDI nor any other framework or guiding document about closing the digital divide mentions offline-first technology or Offline Internet as defined by the consortium in any significant way.

Yet, these "out of scope" areas are the ones most impacted by Offline Internet solutions, and a framework for understanding and measuring how Offline Internet contributes to universal and meaningful connectivity can help paint the fuller picture the IDI alludes to.

Info Box ⓘ

The IDI helps us understand access to universal and meaningful connectivity in a country

Afghanistan

92% of mobile cellular network coverage

47% of individuals own a mobile phone

11% of households have a computer at home

In 2022, **the cost** of mobile data and voice at a high consumption rate was

21.1% of a household's average income

Source: IDI Dashboard Afghanistan

OLI Members support communities in Afghanistan by providing services deemed "out of scope" by the index like:

- Unrestricted content through satellite downloads (Net Freedom Pioneers)
- Offline digital library resources and offline functioning learning management systems (Darakht e Danesh)
- Offline digital content through portable devices (Kiwix)
- Localized content partnerships and translations (Darakht e Danesh)

Photo: Ladies Learning to Code

Proposing a Spectrum of Meaningful Connectivity for Offline Internet

Recognizing the need to address the digital divide, various frameworks have been developed as explored earlier in this chapter. However, the unique impact and role of Offline Internet in promoting universal and meaningful connectivity has not been fully investigated. To address this exclusion, this report proposes a complementary framework: the OLI Spectrum of Meaningful Connectivity.

This comprehensive framework emphasizes not just the availability but also the relevance and localization of digital content, ensuring that it meets the specific needs of diverse communities.
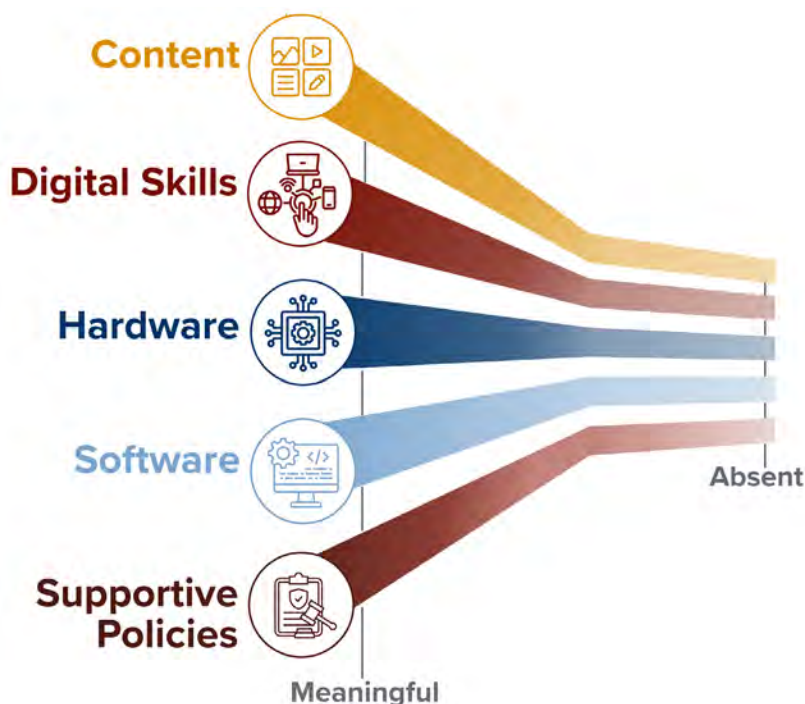
This framework, intended to guide our members, allies, and other stakeholders, offers a broad perspective to understand, discuss, and enhance the role of Offline Internet. The influence of Offline Internet on this spectrum will be discussed in depth in Chapter 3.

The Offline Internet Spectrum For Meaningful Connectivity advocates for the inclusion of Offline Internet in global conversations about closing the digital divide. This comprehensive framework emphasizes not just the availability but also the relevance and localization of digital content, ensuring that it meets the specific needs of diverse communities. It intricately explores various dimensions critical for digital inclusion, such as content, digital skills, hardware, software, and supportive policies, marking each dimension with progressive stages from absence to meaningful access. By prioritizing localized content and enhancing digital skills, the OLI Spectrum aims to boost the practical utility of digital resources in offline settings, thus addressing deeper aspects of digital divides beyond mere connectivity.

> The framework intricately explores various dimensions critical for digital inclusion, such as content, digital skills, hardware, software, and supportive policies, marking each dimension with progressive stages from absence to meaningful access.

OLI's approach complements broader global initiatives aimed at universal internet access, such as those by the ITU and A4AI, by providing solutions that provide essential services where traditional connectivity methods fall short. Unlike other initiatives that primarily focus on online connectivity and broadband infrastructure, OLI offers a bridging solution that prepares communities for digital participation

through offline resources. This framework aligns with user-centric approaches that prioritize user needs and local contexts, advocating for supportive policies and infrastructure that facilitate offline digital access. In essence, OLI enriches the global efforts towards digital inclusion by ensuring that all communities, regardless of their online connectivity status, can access and benefit from digital technologies in a meaningful way.

The OLI Spectrum consists of five categories that represent both the ways in which individuals and communities are disconnected from the internet, and the work of OLI Members and their contributions to areas considered both in scope and out of scope by ITU's Framework. The following pages present each category and ways of understanding how a lack of or meaningful access to that category impacts individuals and communities.

OLI Spectrum of Meaningful Connectivity

Content

> " *There isn't enough content in the language I speak for the internet to be useful to me.*

The "Content" category in the Spectrum of Meaningful Connectivity encompasses *access to and creation of curated, relevant, and localized digital content.*

Absent Content represents a complete absence of digital content, with no provision for viewing or interaction.

Limited Content refers to a state where access to digital content is present but may be sporadic, unreliable, or of substandard quality.

Basic Content signifies a more dependable access to digital content. However, challenges may arise in this context such as language barriers, or a dearth of relevant content.

Meaningful Content embodies unrestricted access to digital content that is fully localized, relevant, evidence-based, and curated to the needs of the user base. This means the content is available in local languages, aligns with the personal, professional, or educational needs of the users, and is curated to ensure accuracy, reliability, and suitability to the user context.

Digital Skills

"I have devices and a connection but I don't have the skills to use them.

The "Digital Skills" category in the Spectrum of Meaningful Connectivity represents a multifaceted approach to understanding digital skills proficiency. It acknowledges that proficiency is not linear or binary but spread across a spectrum where individuals might simultaneously exhibit varying degrees of competency in different areas.

Absent digital skills represents a complete lack of knowledge or ability to use digital technologies. This level of the spectrum represents an inability to operate digital devices, navigate the internet, or use basic applications. This could be due to a lack of exposure to technology, lack of educational opportunities, or other socio-economic factors.

Limited digital skills represents the foundational skills needed to use digital technologies. These are the basic abilities to operate a device, navigate the internet, use applications, and understand online etiquette. This competency level is where individuals can access and consume digital content but may have limited abilities to create, analyze, or secure it.

Basic digital skills indicate an ability to use digital technologies and also to apply them in different contexts, troubleshoot common problems, and understand the basics of online security and privacy. It is the ability to use digital tools to enhance productivity, perform tasks more efficiently, and participate in digital communities.

Meaningful digital skills refer to the ability of an individual to proficiently use and engage with digital technologies without needing specialized knowledge. These skills involve a solid understanding of how various technologies work, allowing individuals to solve problems and innovate. They also include the capacity to adapt to new technologies as they become relevant. While individuals may not be experts in areas like programming, network architecture, machine learning, or cybersecurity, they possess the competence to navigate the digital world effectively and safely. Meaningful digital skills enhance individuals' lives and enable them to contribute to their communities through proficient use of technology.

Hardware

> " *Data packages and smart devices are too expensive.*

The hardware category in the OLI Spectrum of Meaningful Connectivity encompasses the array of physical devices and infrastructure needed for individuals to interact with digital content and experiences.

Absent hardware signifies a complete lack of digital infrastructure, including devices like computers, smartphones, and tablets. This absence may stem from financial limitations, scarce local resources, political restrictions, or insufficient infrastructure, such as inadequate physical telecommunications, frequent power outages, or a lack of accessible facilities like libraries or community centers.

Limited hardware may cover access to outdated devices or those that struggle to run modern applications. Internet connectivity may be slow, unreliable, or subject to strict data constraints due to high costs, a lack of service providers, or restrictive policies.

Basic hardware denotes devices with a stable internet connection. However, associated costs, such as device maintenance and monthly internet fees, may impose a significant financial burden, constraining improvements due to financial limitations or a lack of better services.

Meaningful hardware means unrestricted access to up-to-date devices and a reliable, high-speed internet connection that is affordable and doesn't impose a financial burden. The concept of meaningful hardware should also encompass knowledge about infrastructure engagement choices and access to alternatives like community networks and closed networks.

Software

"

*We have frequent power cuts,
I need software that can be used offline.*

The "Software" category in the Spectrum of Meaningful Connectivity encapsulates the varying degrees of user engagement with digital content and experiences via websites, apps, or computer programs.

Absent software indicates that even with access to devices, they might be unable to find, use, or afford the necessary software for digital engagement. This could stem from an unavailability of localized software, or high costs.

Limited software means that individuals have access to a few software options that could be outdated, unreliable, or not userfriendly. The available software may lack necessary features for a meaningful user experience or may not align with the user's cultural context or language.

Basic software represents reliable access to a variety of software options that satisfy basic needs. However, these options might be generic and not fully address the user's specific needs, preferences, or cultural context. The abundance of choice might overwhelm users and make it difficult for them to select the best software for their needs.

Meaningful software implies unrestricted access to a vast array of software options that are localized, accessible, userfriendly, and tailored to individual needs, preferences, and contexts. This software is available in the user's language, culturally relevant, accommodates varied user abilities, and delivers a rich, meaningful user experience.

Supportive Policies

" I have a connection, but I'm concerned about privacy."

Supportive policies in the OLI Spectrum of Meaningful Connectivity are global, national, and local policies, frameworks, and social levers that provide the foundation for and encourage programs, funding mechanisms, and raise awareness for universal access to meaningful connectivity across other areas of the spectrum. It also involves the efforts of governments to protect their citizens' digital rights, including the rights to freedom of expression and data protection. Suppression of these rights at any level inhibit universal and meaningful connectivity. Where supportive policies are absent, Offline Internet may provide solutions to overcome restrictions on digital rights.

Absent supportive policies indicate that no strategic measures or legal provisions are in place to support digital inclusion. This could be due to a lack of political will, limited resources, or a lack of awareness about the significance of digital connectivity.

Limited supportive policies indicate that measures might be in place to foster digital inclusion, but they may be fragmented or lack sufficient scope. This might include some funding mechanisms, or initial programs aimed at promoting digital literacy, but these measures may lack coordination or fail to reach all parts of the community.

Basic supportive policies indicate a more comprehensive approach to digital inclusion. This might include a national digital strategy, significant funding for digital infrastructure, or widespread programs to boost digital literacy. However, these measures may still not reach all individuals or communities, and there may still be significant barriers to access.

Meaningful supportive policies include comprehensive and well-coordinated strategies at global, national, and local levels that provide the foundation for universal access to meaningful connectivity. This includes well-funded programs, wideranging policies that address all barriers to access, and broad societal recognition of the importance of digital inclusion. In this stage, access to meaningful connectivity is seen as a fundamental right, and all measures are in place to ensure this right is realized.

Photo Credit: CC by NC by Peter Amoabil

Connectivity isn't black and white, it is a spectrum - Offline Internet provides solutions

The "OLI Spectrum of Meaningful Connectivity" illuminates the complex nature of connectivity, which is far from a binary state of being connected or disconnected. Instead, it presents a spectrum that acknowledges the varied degrees of digital access and literacy across different communities. This framework effectively showcases how Offline Internet can provide targeted solutions that address the specific connectivity challenges faced by underserved areas. By detailing the gradations from absent to meaningful levels in content, digital skills, hardware, software, and supportive policies, the OLI Spectrum highlights the necessity of nuanced approaches in the global endeavor to bridge digital divides. These targeted strategies ensure that all communities, regardless of their initial digital status, can progress towards meaningful connectivity.

These targeted strategies ensure that all communities, regardless of their initial digital status, can progress towards meaningful connectivity

Thus, Offline Internet stands out as a critical component in the broader dialogue on digital inclusion, offering adaptable and impactful solutions that cater to the diverse needs of a globally connected world.

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The Impact of Offline Internet

Key Messages

Offline Internet provides impact across the connectivity spectrum: This chapter showcases how members of the Offline Internet Consortium are making significant impacts on universal and meaningful connectivity through a structured framework organized into five key categories.

Offline Internet supports the creation and distribution of locally relevant, contextualized content: Offline Internet initiatives address critical gaps in digital content availability. This chapter showcases how Offline Internet innovations enable communities to access and even create information pertinent to their cultural and educational contexts without needing internet connectivity.

Offline Internet enhances digital skills development: Offline Internet promotes digital skills, as exemplified by projects explored in this chapter. By providing offline-accessible platforms for learning, Offline Internet helps develop essential digital literacies, preparing individuals for the digital world, regardless of their current internet access, thus ensuring a broader and more inclusive digital participation.

Offline Internet initiatives pioneer devices and infrastructure: Through initiatives like community networks and satellite solutions, Consortium members are pioneering hardware innovations that enhance connectivity in low-infrastructure areas. These examples demonstrate a broader commitment to developing and deploying hardware that can adapt to diverse environments, ensuring that digital content reaches wider,

Offline-first software ensures accessibility: By developing offline-first software, Consortium members ensure that essential applications and digital services are usable without constant internet connectivity. This approach not only maintains continuity in digital interactions but also enhances the reliability and accessibility of digital content in disconnected environments.

Offline Internet advocates contribute to policies that support meaningful connectivity: Consortium members actively champion policies that promote meaningful connectivity, focusing on safeguarding the Freedom of Expression, ensuring Universal Access to Education, and upholding Digital Rights. This advocacy work addresses the challenges of digital exclusion and contributes to Offline Internet's ability to support the disconnected.

It is clear that Offline Internet solutions make a meaningful difference in areas important to universal and meaningful connectivity, especially those deemed out of scope for measurement and investment by organizations like the ITU which focus more on mobile network coverage and device ownership. We discussed a framework for understanding and measuring the impact of the work of Offline Internet Consortium members organized around 5 key categories: Content, Digital Skills, Hardware, Software, and Supportive Policies. In this chapter, we will go into detail on each of these categories and zoom in on work OLI members are doing and the impact it has.

Content

Chapter 1 discussed how the lack of locally relevant, contextualized content contributes to the digital divide. Even with stable, high-speed internet and an affordable device, people may lack content created by and for their local communities. The Offline Internet Consortium views this as a key challenge to universal and meaningful connectivity. Several interview participants pointed out that information can be distributed without the internet, as libraries did before the internet's existence. The aim of Offline Internet is to offer relevant, empowering digital information without the need for internet access.

True freedom of information includes the ability to create and share content regardless of connectivity.

There are innovations and programs that support offline content creation, curation, and delivery. The next page goes over these areas in detail.

Content creation Includes networks of translators who produce content in local languages. Others involve volunteers working with institutions to digitize content in their collections, making historical and cultural resources accessible for distribution offline in a digital form.

Offline accessible learning management systems allow teachers to create lesson plans and resources that can be hosted and uploaded once a connection is available. Offline doesn't mean static, through offline accessible tools individuals and communities can create, digitize, document and share knowledge.

Content curation Content curation also requires support and innovation. Even when local language content is available, it may not be curated in a useful way for users.

For instance, teachers need content aligned with their school curriculum and may not have time to do the alignment themselves. Offline Internet Consortium member organizations have addressed these issues through structured data initiatives and by providing curriculum-aligned content on offline-accessible learning management systems.

Wiki Fundi is an offline editing platform developed by Wiki in Africa in partnership with the Orange Foundation. It allows those without a steady internet connection to edit Wikipedia offline and upload their edits when a connection is available, providing a no-pressure environment for practicing digital skills. Schools across Africa use Wiki Fundi as part of the Wiki Challenge Africa Schools competition.[33]

Content delivery Getting content to individuals without consistent internet access involves a multifaceted approach.

For example, offline content delivery can be facilitated through community hubs or centers equipped with local servers hosting a cache of digital content. Users can visit these hubs to access and download materials onto their personal devices for offline use.

Partnerships with local businesses, community organizations, and government agencies can enhance the reach and effectiveness of offline content delivery initiatives. By leveraging existing infrastructure and networks, such collaborations can ensure that educational materials, health resources, and other valuable content reach individuals in remote or underserved areas.

Darakht e Danesh

Darakht-e Danesh, denoting a "knowledge tree" in Farsi/Dari, aims to provide educational access to Afghans and learners worldwide. Spearheaded by the Canadian Women for Women in Afghanistan (CW4WAfghan), a nonprofit organization committed to advancing gender-equitable education and enhancing human rights in Afghanistan. Over its 25-year tenure, Darakht-e Danesh Academi embodies a profound dedication to knowledge dissemination in offline settings. Its multifaceted approach encompasses three distinct branches: the Darakht-e Danesh Library, an extensive repository of free online educational materials available in nine languages; the Darakht-e Danesh Courses, offering self-paced learning opportunities in Farsi/Dari, Pashto, and English; and the Darakht-e Danesh Classroom. Positioned at the forefront of offline internet innovation, Darakht-e Danesh Academi epitomizes the transformative potential of educational outreach, epitomizing a beacon of hope and enlightenment amidst the challenges of limited online access.

In confronting the challenges of limited educational resources and internet accessibility, Darakht-e Danesh Academi addressed critical gaps in Afghanistan's educational landscape. A significant impediment stemmed from the dearth of locally produced materials for capacity building, with imported books from neighboring countries like Iran and Pakistan often failing to align with Afghanistan's curriculum.

Moreover, existing content lacked certification alignment, hindering learners' educational progression. Compounded by the widespread absence, instability, or prohibitively high costs of internet access across the nation, these challenges necessitated innovative solutions. Consequently, the organization pioneered the development of an offline digital library, strategically installed and supplemented with comprehensive training initiatives at 13 teacher training colleges nationwide.

Darakht e Danesh worked with partners to localize children's books from various sources into local languages, and create audio books, addressing accessibility barriers. Prior to the Taliban's assumption of power, these digital libraries were extended to 42 educational institutions across Afghanistan, emblematic of Darakht-e Danesh Academi's commitment to equitable educational access amidst formidable obstacles.

In the aftermath of the Taliban's control, the status of the digital libraries set up by Darakht-e Danesh Academi remains unclear. Despite this uncertainty, there's reason to hope that these libraries are still operational. Their **wide reach, ability to function offline, and the training they provided** suggest they may still be serving their purpose. While we lack definitive information, there's optimism that these libraries continue to provide access to information despite the upheaval.
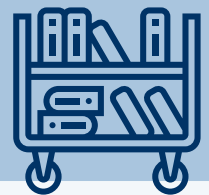
Libraries Without Borders' Ideas Box

The Ideas Box initiative emerges as an inventive solution serving as a novel content delivery platform to address the urgent need for information and cultural access in post-disaster settings. Originating from Libraries Without Borders' experiences in Haiti following the 2010 earthquake, the Ideas Box evolved as a portable multimedia center designed to provide essential resources where traditional internet connectivity is lacking. Developed in collaboration with renowned designer Philippe Starck and UNHCR, the Ideas Box exemplifies innovation and resilience in delivering vital content to displaced communities worldwide.

Deployed in diverse contexts, from refugee camps to rural communities, the Ideas Box serves as a comprehensive content delivery hub, offering a rich array of offline tools and resources within minutes of setup. Equipped with a satellite internet connection, digital server, tablets, laptops, cameras, and cultural materials, the Ideas Box empowers communities to access educational content, engage in creative endeavors, and preserve cultural heritage, all without relying on traditional online resources. This holistic approach underscores the belief in the transformative power of education and culture, leveraging offline internet capabilities to bridge digital divides in the most challenging environments.

In Bangladesh, the Ideas Box program was introduced to the Kutupalong refugee camp complex in Cox's Bazar, home to nearly one million Rohingya refugees fleeing violence in Myanmar. Recognizing the profound barriers to information access and formal education faced by the Rohingya community, Libraries Without Borders adopted a context-specific, iterative approach to content delivery.

Pilot projects, such as "When I Was Young" and "Draw Your Camp," provided valuable insights and opportunities for community engagement, building trust, and tailoring content to meet the specific needs of Rohingya adolescents.

Central to the success of the Ideas Box program is **the emphasis on collaborative partnerships and adaptive content delivery strategies.** Leveraging inter-sector partnerships, Libraries Without Borders integrates the Ideas Box into existing programs and services, maximizing impact and resource sharing. The introduction of mobile content delivery services further extends the reach of the program, ensuring that essential resources and opportunities for learning and cultural expression are accessible to all, even in the most challenging environments where traditional internet access is limited or non-existent.

Digital Skills

Despite recent improvements in connectivity, a persistent gap in digital skills presents a significant barrier to effective and meaningful engagement with technology. The 2021 Digital Skills Gap Index (DSGI)[34] highlights a critical shortfall in the ability of educational institutions and corporate training programs to provide the necessary skills for employment across major industries. This deficiency represents a substantial obstacle to technological advancement and economic growth, emphasizing the urgent need for strategic interventions in educational policy and workforce training. A report commissioned by the Asia-Pacific Economic Cooperation and conducted by Wiley reveals that only 7.3% of APEC respondents consider their university graduates as "Highly Skilled" in terms of digital readiness for entry-level jobs.[35]

The report "Digital Literacy: The Great Divide" summarizes discussions from consultations held on March 9 and 28, 2023, organized by Digital National Alliance Bulgaria, Kankan*Tree, and

> **Digital literacy encompasses more than just basic internet access; it involves the effective utilization and understanding of digital technologies.**
>
> *"Digital Literacy: The Great Divide" report, 2023*

MKAI.[36] These sessions addressed vital issues surrounding digital literacy, artificial intelligence, and the democratization of digital innovations. A key insight from these discussions is that digital literacy encompasses more than just basic internet access; it involves the effective utilization and understanding of digital technologies. Participants identified a pressing need to bridge the digital divide, which affects not only those without access to technology but also those lacking the skills to use it effectively.

Despite recent improvements in connectivity, a persistent gap in digital skills presents a significant barrier to

effective and meaningful engagement with technology. The 2021 Digital Skills Gap Index (DSGI)[22] highlights a critical shortfall in the ability of educational institutions and corporate training programs to provide the necessary skills for employment across major industries. This deficiency represents a substantial obstacle to technological advancement and economic growth, emphasizing the urgent need for strategic interventions in educational policy and workforce training. A report commissioned by the Asia-Pacific Economic Cooperation and conducted by Wiley reveals that only 7.3% of APEC respondents consider their university graduates as "Highly Skilled" in terms of digital readiness for entry-level jobs.[23]

During the consultations, Daniel Opanubi from Omdena emphasized the cultural disconnect impacting digital literacy, stating

> *"There are people so far removed from digital culture that they are unaware and uninterested in getting involved. We need to reach out and engage these individuals."*

Dr. Haydee Shoembar also highlighted the broader implications of digital literacy, noting,

> *"Digital literacy is much more than access to the internet. If we fail to address this adequately, we risk leaving many behind…"*

Relying only on broadband expansion to close the digital divide denies those without broadband access the chance to develop digital literacy skills. Offline networks offer a practical and user-friendly solution for cultivating digital literacy. These initiatives teach essential skills such as navigating digital platforms, evaluating the quality of digital information, and ensuring safety and security online. Many Offline Internet projects also focus on combating misinformation and empowering youth to recognize and counteract disinformation. This approach not only bridges the digital divide but also enhances the overall digital competence of communities, preparing them for the challenges and opportunities of the digital age.

Offline Internet gives people the chance to build digital literacy skills without needing access to the internet.

Makaia

Makaia is a Colombian organization focused on leveraging technology for social change. Recognizing that only 10% of rural communities in Colombia have internet connectivity, Makaia provides software, hardware, and technology training to civil society organizations, schools, community centers, parents and teachers to help them adopt and implement technology. Makaia not only provides training on digital skills and computational thinking, but also timely issues like misinformation and online risks.

Makaia's goal is to create capabilities for social development with technology, resources and innovation. The technology itself is not the end goal, but rather understanding how it can help solve problems for vulnerable groups like children, youth, women, elderly, disabled, and rural farmers. They work closely with local education communities not just to provide access, but to ensure the technology is used effectively to create opportunities and close inequality gaps in areas like jobs, health, education and services. Currently, Makaia is supporting 19 community projects focused on building digital skills across Latin America.

One such community project is "Empowering Briceño's Coffee Community Through Digital Skills and Connectivity."[37] This collaborative initiative aimed to redefine the future of Briceño by harnessing the potential of digital technologies and specialty coffee production. Central to the project was the ambition to elevate the coffee value chain in Briceño by focusing on the production of specialty coffees and integrating digital technologies.

By providing comprehensive technical assistance and transferring knowledge on ICT, the initiative improved not only the quality and productivity of coffee but also the socio-economic conditions of the local farming communities. These efforts fostered social inclusion, gender equality, and youth engagement, essential for the community's sustainable development.

Hardware

The infrastructure required to connect to the expansive world wide web is not as universally available as it might seem. As highlighted in Chapter 1, across various parts of the world, including some developed regions, access to essential broadband infrastructure is starkly limited. This scarcity significantly hinders many people's ability to access the wealth of information and opportunities available online. Compounding this issue is the cost of broadband subscriptions, which are often indispensable for a stable and fast connection but can be prohibitively expensive for many families and individuals.

Furthermore, the devices necessary to utilize broadband—such as computers, tablets, and smartphones—are not only costly but also pose additional financial burdens when they need maintenance or replacement after becoming obsolete. According to the ITU statistics dashboard, only 47% of individuals

Offline Internet is facilitated by innovative hardware solutions that not only significantly decrease costs, but also address critical issues like censorship and data privacy. In interviews, members of the Offline Internet Consortium (OLI) discussed a variety of hardware solutions, including satellites, TV white spaces, community networks, and devices such as the versatile Raspberry Pis, that are utilized for local storage and distribution of content.

in low-income brackets own a mobile phone.[38] Other demographic factors such as gender, age, and geographic location also influence mobile device ownership. The 2023 report highlights a concerning trend: women are 8% less likely than men to own a mobile phone, a slight improvement from the 10% gap reported in 2020.

Consequently, both the limited access to essential digital infrastructure and the high costs associated with maintaining an online connection present substantial barriers that urgently need to be addressed.

When considering connectivity for low- and middle-income countries (LMICs), cost becomes a key factor. Traditional broadband, often delivered via mobile data or satellite, is not only difficult to access in remote areas but can also be prohibitively expensive. Reports by the Education Commission and UNICEF estimated the costs of connecting schools, but these estimates did not account for innovations like Offline Internet technologies, which can reduce bandwidth usage by up to 97% through local sharing.[39] This has major implications for drastically lowering costs in regions where broadband infrastructure is either lacking or too expensive to build and maintain.

In LMICs, where the average education budget per child ranges from $50 to $200 USD annually, technology spending could be as low as $3.75–$15 USD per student per year. This makes costly broadband connections, which grow more expensive with increased data use, unaffordable for most education systems.

Offline Internet solutions, such as local servers built on affordable devices like Raspberry Pis or USB key content distribution, offer a much cheaper alternative. These solutions allow communities to access digital content without constant internet access, stretching limited budgets further.

While some advanced Offline Internet solutions, like the Ideas Box, can be expensive (up to 50,000 EUR), they are designed for extreme contexts, such as post-disaster areas. For most communities, however, Offline Internet's low-cost approaches are far more affordable than even traditional satellite connections. This makes them a sustainable option for delivering high-quality educational content, reducing financial strain, and ensuring wider access to learning resources.

In situations where multiple nearby users need to access the same content, like in education and healthcare institutions, offline sharing between devices can reduce bandwidth usage 97% and dramatically increase download speeds.

Offline Internet is facilitated by a range of innovative hardware solutions that not only significantly decrease costs but also address critical issues such as censorship and data privacy. In interviews, members of the Offline Internet Consortium (OLI) discussed various hardware solutions, including satellites, TV white spaces, community networks, and devices such as Raspberry Pis, which are used for local storage and distribution of digital content. These devices play an instrumental role in ensuring that offline access to educational and cultural resources remains feasible even in the absence of continuous internet access.

While some consortium members develop and supply this essential hardware, a common sentiment among interviewees was the need for a broader understanding and acceptance of these hardware solutions. Despite the evident benefits of these technologies, there is still room for growth in terms of widespread knowledge and adoption. Critical factors such as compatibility with existing systems, ease of use, and the necessity for continuous training and support were highlighted as key to the successful implementation of these hardware solutions.

In the following section, we delve into a detailed exploration of a diverse range of hardware solutions that make Offline Internet possible, and discuss their impact.

Devices that support Offline Internet

USB Keys, Flash drives, Raspberry Pi computers, micro SD cards, and other devices that support Offline Internet are significant to addressing the digital divide. They provide accessible, low-cost solutions for data storage and distribution in areas with limited or no internet connectivity.

USB keys are particularly effective, given their portability and capacity to store a substantial amount of digital content. These can be easily disseminated among community members, facilitating the exchange of vital information without the reliance on continuous internet access. Raspberry Pis contribute further by acting as economical, compact computers capable of hosting and managing local servers. This functionality supports a range of applications from educational programs and community projects to local content management systems.
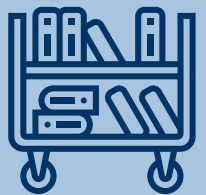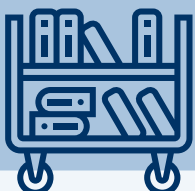
Together, these devices are instrumental in expanding the scope of Offline Internet, thereby enhancing community access to essential digital content, software, and skills development opportunities.

Community Network Infrastructure

Grassroots community networking represents an integral approach to overcoming digital exclusion, particularly in areas burdened by limited internet infrastructure. This strategy utilizes local access points to expand mesh networks, which in turn provide local connectivity and access to open-source applications for communication, network management, web browsing, and media streaming.

In Mauritania, the limited internet connectivity posed significant challenges in accessing digital content. To address this, The Akelius digital learning application was made accessible offline through a 'MeshNet' function, enabling wireless connections without the internet.[40] This innovative approach allowed content to be downloaded onto a connected tablet and then transferred to other tablets offline, effectively reducing logistical hurdles and data costs. The MeshNet function successfully served around 2,500 users, and evaluation data revealed improved learning outcomes and heightened digital skills among both students and teachers. The team further supported this initiative by planning a customized mesh networking kit equipped with open hardware and offline-first open-source services.

Decentralized networks like these promote resilience against disruptions and censorship, offering a robust and equitable distribution of digital resources. The success of these initiatives highlights the transformative potential of customized, locally-managed network solutions in bridging the global digital divide. This model not only advances a more accessible and empowered digital future but also demonstrates how communities can leverage technology to foster significant educational and social benefits.

Wakoma

In the Northwest Territories of Canada, rural and remote Indigenous communities face significant challenges due to geographic and digital divides. These communities, characterized by their profound connection to the land and distinct cultural practices, require unique approaches to technology adoption and digital literacy. In response, Wakoma collaborated on a transformative project aimed at co-designing community network infrastructures that respect and integrate local contexts and needs.[41]

The project initiated a series of participatory workshops that brought together community members, researchers, and technologists. These workshops employed "hacker literacies" and "infrastructure literacy" to foster a deeper understanding of network

infrastructure and explore the potential of community networking. This approach was decisive in reimagining connectivity infrastructure that not only addressed the unique challenges faced by these communities but also resonated with their socio-cultural dynamics.

Beyond infrastructure development, the project placed a strong emphasis on developing network infrastructure literacy. The community members engaged in hands-on activities that helped demystify technology and build confidence in managing and sustaining their network. This educational component was vital in ensuring the community could independently maintain and expand their network, reinforcing the sustainability of the technological intervention.

Wakoma's collaboration with the Indigenous communities of the Northwest Territories exemplifies the power of community-driven technological solutions.

By aligning digital literacy and infrastructure development with the community's unique cultural and geographic context, the project not only bridged the digital divide but also empowered the community with tools for self-determination and economic development.

Offline Internet via Satellite and Net Freedom Pioneers

Net Freedom Pioneers developed satellite and data transmission technology that provides offline internet access to users in Iran, Afghanistan, and other places facing censorship or privacy violations. Net Freedom Pioneers provides equipment and training to users so they can download content broadcast daily via satellite. The content includes educational materials, music, movies and political information.
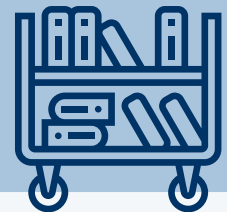
Users can record up to 3GB of data per day on external storage devices, then disconnect the storage device from the satellite receiver and connect it to a computer to access the downloaded content offline. This allows users to access restricted content without using the internet. Satellite receivers are common household items in target countries, so users are only required to retune their existing equipment to receive the broadcasts. By avoiding internet downloads, the system helps users avoid high internet costs for large data transfers. In addition to the technology deployment, they also provide digital security training and workshops to help citizens safely access and distribute content.

Photo credit: SolarSPELL

Software

In recent years, technology has shifted towards relying heavily on internet connectivity and remote processing power. However, rapidly deploying new software, such as AI, without adequate testing can have potential downsides. Developers that build new software locally before online deployment take advantage of benefits like reduced data costs, enhanced privacy and security in certain contexts, and comprehensive testing during development.

Furthermore, offline solutions can serve as low-maintenance "plug and play" options, unlike those requiring continuous upkeep and setup. This reduces cost-related and skill-specific barriers.

Interviewees stressed the need for offline-first and local-first software when discussing offline tools for universal and meaningful connectivity.

However, it is important to acknowledge that fully offline solutions, with no intention of ever transitioning online, have their limitations. Conversely, many technologies today are designed to function exclusively online, disadvantaging users with inconsistent connectivity or varying needs and abilities.

Info Box ⓘ

A study by Rebecca Ferguson at The Open University, shows that faculty that privilege online only resources disadvantage their students. The report states,

"The flexibility of online and distributed learning has prompted many educational providers to move towards an approach that privileges online resources, sometimes without the option to access resources offline or in printed form. This can be a problem for disabled learners who are either unable to access online resources or who cannot do so for extended periods of time and therefore require other options."[42]

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Offline-first technology and universal design principles

Universal Design (UD), as defined by the Disability Act of 2005 and reinforced by the United Nations Convention for the Rights of Persons with Disabilities, envisions an environment that can be accessed, understood, and used to the greatest extent possible by everyone, regardless of age, size, or ability, without the need for adaptation or specialized solutions.[43] This comprehensive approach to design, often encapsulated under terms like "Design for All" or "inclusive design," aims to make products and environments universally accessible. Yet, software that functions solely online contrasts with these inclusive principles, as they inherently demand specific conditions—namely reliable internet access—that are not universally available.

In practice, such as in the funded research on Universal Design of Shared Educational Campuses in Ireland, we see how these principles are not just theoretical but have practical applications that significantly impact users' lives. These projects demonstrate that when environments and technologies are designed considering all users, they promote greater independence, facilitate easier access to information, and contribute to a more equitable society.[46]

However, when technology is designed to be online-only, it excludes those without stable, affordable internet access, effectively segregating users based on their geographical and economic conditions. This not only fails the universal design's mandate to accommodate "the widest possible range of situations" but also contradicts the principle of equitable use, which seeks to avoid any segregation or stigmatization of users based on their ability or circumstance.

Offline-first is a term used to describe such technology. According to Android, "An offline-first app is an app that is able to perform all, or a critical subset of its core functionality without access to the internet. That is, it can perform some or all of its business logic offline."[44] Offline-first software may need to be connected to the internet to refresh data and update content, but the software itself fully functions offline.

Another design framework for offline accessible software is local-first. *Local-first* software is a set of principles for software that enables both collaboration and ownership for users.[45] The key ideals include the ability to work offline and collaborate across multiple devices, while also improving the security, privacy, long-term preservation, and user control of data. Existing approaches like web apps provide collaboration but not ownership, while local files provide ownership but make collaboration difficult.
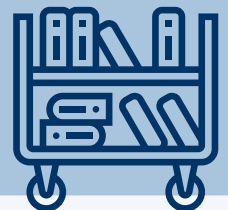
OLI members have been developing applications that embody offline-first and local-first design to deliver digital information to users disconnected from the internet.

Kiwix

Kiwix is a charitable organization that runs a free open-source software initiative aimed at enabling offline access to educational materials, with a particular emphasis on Wikipedia and similar Wikimedia projects. The term, symbolizes their mission to make Wikipedia available offline.

Kiwix is a software that creates ultra-compressed versions of whole websites, stored as a single (.zim) file. These files are compact enough to be saved on mobile devices, PCs, or affordable hotspots. Kiwix functions like an ordinary browser, but it accesses these local copies instead of the internet. Even without internet access or with limited connectivity, users can browse as if they were online.
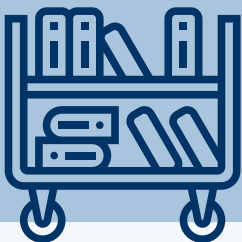
Both the software and the content are open-source and free for use and distribution.

Kiwix is so prolific that it is impossible to fully measure their impact. While they report that in the first two months of 2024 they had upwards of 10 million zim file downloads, the ability to share content peer to peer means there is no way to trace how widely downloaded content is being shared. Stephane Coillet-Matillon shared how he read an article about Wikipedia being loaded onto flash drives and "being lost" on the ground for others to find and use. Stephane said, "And so I wrote to them and they were like, oh yeah, we're using Kiwix and I was like, why don't you tell me? And they were like, it's free software. I don't need to pay you. Nor talk to you. I just take it and I use it." There are a diverse array of users that rely on Kiwix for access to relevant digital information. In prisons, for example.[47]

This case demonstrates the need for and wide usage of software like Kiwix, while also demonstrating the difficulty of quantifying the impact. Still, plenty of users share their stories of Kiwix, like Daniel, a medical student in the Democratic Republic of Congo who used Kiwix to support their education by being able to access Wikipedia medical articles offline.[48] Given the cost of data in his country, being able to access educational resources offline, and without data charges makes education affordable.

Learning Equality's Kolibri

Kolibri, created by Learning Equality, is a transformative offline internet solution that aids learning in regions where internet access is scarce. It is compatible with various devices and operating systems, which enables usage of existing legacy hardware and affordable devices, making it cost-effective for resource-limited environments.

The offline-first product ecosystem includes a learning platform, curricular tool, a library of open educational resources, and a toolkit for implementation in diverse learning environments. This software facilitates self-paced learning, with built-in educator support tools like a coach dashboard for actionable real-time feedback, exercises, and lesson and quiz creation. Content sharing and data syncing are possible without internet access via a local Wi-Fi network or storage device.

The Kolibri Library is a key component of the ecosystem, boasting nearly 100 educational collections. Users can tailor these resources to their needs using the Kolibri Studio curricular tool, aligning them with specific curriculum standards.

> **One of the significant impacts of Kolibri can be seen in the Kakuma refugee camp in Kenya. Here, teachers have utilized Kolibri to offer digital skills training and access to essential learning materials. The software has notably improved girls' access to education and performance, particularly in STEM subjects, by circumventing resource limitations.**[49]

Supportive Policies

Offline Internet solutions have great potential to narrow the digital divide and advance digital rights, significantly promoting the Freedom of Expression, Digital Rights, and Universal Access to Education. However, their successful implementation and widespread adoption largely depend on their inclusion in policy agendas related to these rights. Recognizing that Offline Internet is often overlooked in these important policy discussions, this section explores the policy frameworks that both support and benefit from Offline Internet. It examines how advocates of Offline Internet can engage in these policy spaces for mutual benefit, and how increased involvement can benefit all parties.

The concept of Offline Internet can be seen as a bridge between the current state of connectivity and the ultimate goal of universal access. To ensure that Offline Internet solutions are not perceived as detracting from investments in connectivity infrastructure, more needs to be done to educate stakeholders. Offline Internet solutions should be recognized

Policy makers need to be educated about Offline Internet so they can include it in discussions about meaningful and universal access to connectivity.

for their unique role in enabling access in areas where traditional online connectivity is limited or non-existent.

The **Freedom of Expression**, defined by UNESCO as the "free flow of ideas by word and image," is a fundamental right that Offline Internet solutions actively uphold. These solutions allow users to access, create, and share information freely, even in regions where online access is restricted due to censorship or infrastructure limitations. This ensures that all individuals, regardless of their geographical location or economic status, can express their views and engage in meaningful discourse.

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Digital Rights encompass a range of elements, including the right to privacy, freedom from surveillance, and the right to access digital resources. Offline Internet solutions enhance these rights by providing users with control over their data and offering a platform for accessing information without the need for constant online connectivity.

Universal Access to Education is another right that Offline Internet solutions support. By providing offline access to educational content and resources, these solutions make learning accessible to all, regardless of their connectivity status. This is particularly impactful in remote regions and amongst marginalized communities where access to quality education may be restricted.

> Through collaboration with members and external partners like UNESCO and the United Nations, IFLA works to amplify libraries' unique contributions and realize their potential in upholding these rights and values. By providing practical tools, issuing guidelines, and facilitating knowledge exchange, IFLA empowers library professionals to advocate for core library values and enhance their professional practice, ensuring that libraries continue to serve as pillars of global communities.

IFLA: Advocating for Freedom of Expression and Digital Rights

IFLA, the International Federation of Library Associations and Institutions, is a global organization dedicated to advancing the role of libraries in fostering literate, informed, and participatory societies worldwide. Grounded in the principles of freedom of access to information and expression, IFLA promotes universal and equitable access to knowledge and resources for social, educational, cultural, democratic, and economic well-being. Embracing diversity and inclusion, IFLA advocates for intellectual freedom, digital inclusion, and freedom from discrimination.

IFLA supports Offline Internet by providing thought partnership on how these rights intersect with the values and work of Offline Internet, especially where digital libraries are concerned. They were a key organizer at the first ever meeting of the Offline Internet Consortium alongside Arizona State University Library and Libraries without Borders.

Their response to the Global Digital Compact includes advocacy for offline solutions, "**Regulate to enable experimentation and alternative means of connectivity**: governments should not be protecting the monopoly or oligopoly positions of legacy internet providers, not only in situations where they are failing to deliver, but also where innovation could deliver better experiences."[50]

Photo credit: SolarSPELL

Working Across the Spectrum

The OLI Spectrum covers five areas important to the understanding of the value and impact of Offline Internet on universal and meaningful connectivity, and in this chapter we have further explained these categories and provided examples of how the Offline Internet Consortium's members

It is important to understand that many Offline Internet initiatives contribute to more than one OLI Spectrum category.

contribute to each of them. It is important to understand that many Offline Internet initiatives contribute to more than one OLI Spectrum category. Those building hardware or software solutions often provide training on how to use them, for example. Here we look at one organization that provides impact across several spectrum categories.

SolarSPELL's Impact on Offline Internet Access Across the Spectrum

SolarSPELL is an initiative led by Arizona State University that leverages solar-powered, portable digital libraries to enhance educational opportunities in remote and underserved areas around the world. The core mission of SolarSPELL is to empower learners by providing localized educational content and training to build 21st-century skills in environments without reliable internet access. SolarSPELL's approach includes the creation of curated, localized digital libraries; the deployment of innovative technology; robust training through a Train-the-Trainer model; and a continuous cycle of impact evaluation for iterative improvement.

Training is integral to the initiative's success, with the Train-the-Trainer model ensuring that local educators

and community leaders are equipped with the necessary skills to utilize and sustain the technology and content provided. Too often technology is deployed in schools and communities without providing adequate, quality training. The result is that those devices sit in cupboards unused. SolarSPELL's approach ensures that communities are equipped with the knowledge and skills necessary to meaningfully engage with the content, devices, and hardware.

The process of content collection, curation, and distribution is central to SolarSPELL's effectiveness. The team collaborates with various organizations to source credible and accurate open-access content that can be freely copied and shared. Each resource undergoes rigorous metadata tagging and keywording by a diverse team of interns and staff, including undergraduate and graduate students, librarians, and international development practitioners. This meticulous organization ensures that all content is easily searchable and relevant to the specific needs and cultural contexts of each community.

A unique element of SolarSPELL's operation is its innovative hardware: a solar-powered, rugged device designed for durability and ease of use in challenging environments. This device, which can be charged via solar power or USB, incorporates patent-pending charge control technology that displays battery life, ensuring users can manage power effectively. Weighing just 2.8 lbs, the device is both waterproof and shockproof, made from recycled plastic, and built to withstand the elements, making it ideal for field deployment.

The impact of SolarSPELL is significant and widespread. To date, the initiative has successfully implemented 597 digital libraries across 15 countries, trained over 960 individuals, and reached an estimated 300,000 people. This extensive outreach demonstrates SolarSPELL's commitment to transforming educational access globally. By continuously monitoring usage and gathering feedback through tools like usage tracking software and interviews, SolarSPELL adapts and refines its libraries and training programs to meet evolving needs. This data-driven approach ensures the initiative remains responsive and effective, further amplifying its educational impact.
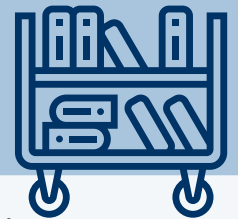
In tandem with robust hardware, SolarSPELL utilizes open-source, offline-first software that allows for the creation and dissemination of digital libraries. This software supports a wide array of educational content and interactive resources, enabling communities to access valuable learning materials without needing an internet connection.

By effectively combining robust training, comprehensive content curation, rugged hardware, and dynamic open-source software, SolarSPELL underscores the profound impact such solutions can have. This initiative's success serves as a compelling case study for the global potential of Offline Internet solutions to create lasting change in underserved communities worldwide.

A New Gold Standard for Connectivity

Key Messages

Offline Internet redefines the gold standard for connectivity: The concept of connectivity must evolve beyond high-speed broadband to include meaningful, universal access where digital content is not only available but also culturally and linguistically tailored, enhancing user choice and accessibility.

Everyone can contribute to Offline Internet: Developers can contribute by designing applications with offline-first functionality, ensuring their software operates seamlessly in low-connectivity environments. Content creators are encouraged to license their works under open licenses and focus on curating and localizing digital content to meet the diverse cultural and linguistic needs of global communities.

Offline Internet needs strategic investment: There is a critical need for increased funding and support for Offline Internet initiatives to ensure they continue to provide valuable digital access and to measure their impact accurately.

Offline Internet advocates call for action: We urge policymakers, educators, technologists, and community leaders to embrace and advocate for an expanded framework of connectivity that includes Offline Internet, thereby fostering a diverse ecosystem of connectivity options.

The world wide web is taken for granted as the gold standard with high speed broadband the central feature of policy agendas that aim to close the digital divide, but as we explored throughout this report, it has not reached its full potential of universal and meaningful connectivity. Offline Internet introduces a nuanced approach that aims to set a new gold standard for connectivity—one that ensures not only universal access but also meaningful and equitable usage for all. This model ensures that content is not just available, but is culturally and linguistically tailored, accessible without continuous internet connectivity, and designed to meet the specific needs of diverse communities, thereby enhancing user choice and mitigating issues related to digital overexposure.

As illustrated by Ruby's transformative work with Kiwix for Schools in Ghana, which we highlighted at the outset of this report, Offline Internet can dramatically expand access to educational resources. It provides opportunities for communities to learn digital skills in accessible ways, preparing them for high speed internet once it is available to them. It also provides solutions that benefit everyone. Universal design for connectivity must include offline-first to be truly accessible and inclusive.

This approach does not merely challenge traditional views of connectivity; it disrupts them, introducing a more flexible, inclusive, and secure method to access digital content. We urge stakeholders at all levels—policymakers, educators, technologists, and community leaders—to embrace and advocate

As we advance, we must continue supporting and expanding such initiatives, ensuring that every community, regardless of geographical or economic barriers, has the tools to thrive in an increasingly digital future.

for this expanded framework. By supporting initiatives that incorporate Offline Internet, through advocacy, direct funding, or launching projects within their own communities, stakeholders can foster a diverse ecosystem of connectivity options.

Such support will not only enhance the overall digital experience by making it truly universal and meaningful, but also champion a future where connectivity is about choice, empowerment, and inclusivity. As we advance, it is important to continue supporting and expanding such initiatives, ensuring that every community, regardless of geographical or economic barriers, has the tools to thrive in an increasingly digital future.

By setting this new gold standard, we not only advocate for a shift in how connectivity is understood and implemented but also ensure that the next wave of digital innovations delivers tangible benefits to all, particularly those who have been left behind by traditional models. This new gold standard for connectivity redefines our digital future, promising a world where technology serves everyone, everywhere, with equity and efficacy at its core.

You Can Get Involved

There are numerous opportunities for individuals and organizations to support Offline Internet across various sectors. Whether you specialize in technology development, content creation, education, training, policy making, or advocacy, there is a significant role for you to play. In the following discussion, we will explore various ways you can contribute to the mission of making meaningful digital content and experiences accessible to all. We encourage you to join us in this endeavor and become an active participant in expanding digital inclusivity.

Develop offline-first solutions

In Chapter 1, we confronted the reality that nearly half the world's population lacks meaningful internet connectivity. This issue is multi-faceted, rooted not only in the availability of digital infrastructure but also in social, economic, and political factors that make access uneven and often unjust. We acknowledged that simply advancing technology for its own sake won't bridge this divide. Instead, the Offline Internet Consortium advocates for a more targeted approach— developing technology that directly addresses the specific challenges faced by unconnected communities. This involves designing solutions that are not only technologically innovative but also culturally and contextually appropriate, ensuring that they are accessible and relevant to those who need them most.

Consortium members stress the importance of incorporating the principles of offline-first and universal design into technology development. For developers, this means considering how an app functions when internet access is disrupted or when bandwidth is severely limited. Does the app remain functional without a connection, and can it provide meaningful utility in isolated or underserved areas? By adopting an offline-first approach, developers can ensure that their applications are resilient and adaptable to various connectivity environments,

thus broadening the reach and impact of their technological solutions.

Furthermore, we must include affected communities in the design process. Engaging directly with those who are often left out of the digital conversation allows for the creation of more inclusive and effective tools. Participatory design helps ensure that the technology not only functions under diverse conditions but also meets the real-world needs of its users. For instance, involving users from low-bandwidth and disconnected environments can provide valuable insights that drive innovations in data compression, offline functionality, and user interface design, making digital content more accessible and impactful.

Contribute content for offline distribution

Open licenses such as those provided by Creative Commons are key for the dissemination of digital content to disconnected communities. These licenses allow Offline Internet advocates to distribute a wide array of information legally, ensuring that it remains free and adaptable. By utilizing open licenses, content creators can give their work a new life in diverse contexts, allowing local communities to modify and contextualize it to suit their specific needs. This is especially important in ensuring that the content not only reaches its intended audience but also resonates with them in a meaningful way.

Publicly funded projects and initiatives have a unique role to play in this ecosystem. By openly licensing their outputs or granting permissions for their use to organizations like the Offline Internet Consortium (OLI), these projects can contribute significantly to the global knowledge pool. This approach not only maximizes the return on public investment but also amplifies the impact of these projects by making their results accessible to a broader audience, including those in remote or underserved regions. Therefore, policymakers and funding bodies should consider open licensing publicly funded digital content projects to facilitate wider access and utilization as recommended by UNESCO in 2019.[51]

The work doesn't end with making content available, however. There is a pressing need for more robust funding and support mechanisms dedicated to content curation, translation, and localization. Content needs to be not only accessible but also relevant and engaging to diverse global audiences. This includes ensuring that digital resources are available in local languages and reflect the cultural and societal norms of the communities that access them. Such efforts ensure that the content is not just available but also inclusive and empowering.

Finally, establishing robust metadata standards can significantly streamline the process of aligning content with user needs. For educators, for instance, this means being able to quickly find curriculum-aligned resources in the appropriate language of instruction. Metadata standards help organize content in a way that is intuitive and user-friendly, reducing the time and effort needed to locate and utilize relevant resources effectively.

Use Offline Internet

If you are involved in providing education and training to communities that lack direct access to the World Wide Web, embracing Offline Internet technologies can significantly enhance your efforts. By integrating Offline Internet into your educational programs, you can facilitate digital skills training, a determining element in achieving meaningful connectivity. This approach ensures that learning and access to information continue uninterrupted, even in areas without internet infrastructure. It enables individuals in remote or underserved communities to build and improve their digital competencies, which are essential for participating effectively in today's digital world.

Settings that demand curated digital experiences, or where privacy and censorship are significant concerns, stand to gain immensely from Offline Internet solutions. In such environments, offline digital resources offer a secure method for accessing educational and informational content, ensuring that every individual has the chance to learn and grow, regardless of environmental limitations. The deployment of Offline Internet platforms in these contexts can foster more inclusive and comprehensive educational opportunities, profoundly influencing the lives of those within these communities by expanding access to knowledge and tools for personal and professional development.

Offline Internet also presents a valuable solution for enhancing digital well-being. In our increasingly connected lives, the ability to disconnect is becoming more precious.[35] Offline Internet allows users to manage their digital engagement more effectively, providing opportunities to access and interact with content without the constant distractions and pressures of online connectivity. This approach can help in fostering healthier digital habits and promoting more balanced digital lifestyles.

Invest in Offline Internet

In the ongoing efforts to close the digital divide, the role of Offline Internet is often overlooked in many frameworks and funding mechanisms. This oversight can stifle innovation and inhibit programs that have the potential to significantly advance global connectivity goals. Offline Internet should not be viewed merely as an interim solution but as an integral component of a comprehensive strategy to bridge the digital gap. By enabling access to digital content in regions still awaiting high-speed broadband, Offline Internet helps sustain educational and developmental momentum.

Offline Internet does not need to compete with initiatives aimed at expanding high-speed broadband; rather, it complements these efforts by serving as a pivotal stepping stone. It allows communities to begin engaging with digital content in ways that are immediately impactful and meaningful,

even before high-speed services are available. This engagement continues to be valuable during the transition to better connectivity and remains a reliable alternative afterward, ensuring continuous access regardless of network stability or affordability.

To truly capitalize on the benefits of Offline Internet, funders and policymakers must integrate it into their investment and support frameworks. Recognizing and supporting Offline Internet as a legitimate component of digital strategy will encourage more widespread adoption and innovation in the field. Additionally, there is a pressing need to develop robust methods for measuring the impact of Offline Internet. By quantifying its benefits, stakeholders can better understand its effectiveness and further refine and promote its adoption. Investing in Offline Internet is not just about providing temporary solutions but about enriching the digital ecosystem with flexible, inclusive, and resilient access options that empower communities at every level of connectivity.

Tell the World

It's time to fundamentally redefine our understanding of connectivity. Too often, we're trapped in a binary mindset, thinking solely in terms of being online or offline. Yet, true connectivity is not just about continuous internet access; it's about ensuring meaningful engagement with digital content, irrespective of one's online status. This means having access to information that is not only relevant and tailored to individual needs but also available in the native language, meticulously curated, and reliable.

Imagine a world where everyone, from urban dwellers to the most remote villagers, has the flexibility to choose how, when, and how much to engage with digital content. This isn't just a convenience; it's a fundamental shift towards digital inclusivity and empowerment. It's about providing people with choices that respect their lifestyle, economic conditions, and cultural context.

You can help us spread the word and reshape the global approach to digital access. Join us in championing a connectivity spectrum that accommodates everyone, everywhere, allowing them to thrive in an increasingly digital world. Let's not limit our ambitions to mere access; let's strive for connection that enriches lives and communities across the globe.

Together we can make sure everyone has access to meaningful connectivity.

Visit http://www.offline-internet.org to learn more!

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