



The Open Web For Emerging Economies: The Elephant In The Room

One of the most disruptive applications of distributed ledger technology (DLT) comes from its implementation in developing countries: Underdeveloped infrastructure, combined with the absence of trust and good faith in central authorities is no longer a disadvantage but, rather, an opportunity. In fact, with decentralized, open, and permissionless digital infrastructure, these nations have the opportunity to redefine the concepts of trust, value, access to services and data management.

Concretely, distributed ledgers allow for a variety of stakeholders (government, private sector, non-governmental organizations, trans-national projects, entrepreneurs, etc.) to create new and accessible applications that straddle the intersection of financial services, data management, social governance, identity management, and virtual reality ([Hill, 2021 Cardano Foundation](#)). In short, the Open Web has a ready-made home for its revolutionary value proposition in much of the global south.

More specifically, in certain developing countries, decentralized finance (DeFi) products

are gaining incredible traction due to a friendly regulatory environment that facilitates crypto innovation and freedom for experimentation. While the West remains entrenched in old and increasingly inefficient infrastructure, countries like China, Kenya, South Africa, and others are fully embracing the potential of new technologies to build new, more efficient, and more lasting digital infrastructure ([IFC, 2019](#)).

These countries are changing at an incredibly fast pace thanks to their hunger for progress and fearless experimentation with new technologies: In the next few years we will see tech hubs blooming all over Africa and other emerging economies, effectively placing them at the centre of the fourth industrial revolution. From this context, it is important to ask:

How can open-source protocols like NEAR Protocol best position itself to integrate with these emerging technology hubs in the developing world?

What new products and applications can be imagined?

And most importantly, what are the most important considerations when breaking into the developing world market for distributed applications and open-digital systems?

In this short piece we focus on exploring how DLT is having an impact on emerging economies, while also looking at what we might expect from such economies and nations in the future. We touch upon the most crucial issues, such as business access for users and entrepreneurs, DeFi and its close connection to software development, as well as the Open Web and the future of distributed ledgers in emerging economies.

Transactions Fees and Barriers to Entry: Internet and Affordability

In developing countries, poor infrastructure, instability, and highly inflationary fiat currencies, make it hard for average people to find reliable means of exchange and to

access financial products and services. In fact, more often than not, people have very limited access to physical banking services and lack the basic documentation to prove their financial identity (making it extremely hard for the majority of the population to ask for loans, start businesses, store wealth, and access global financial markets. However, since the rise of the internet and the digitalisation of infrastructure, things are rapidly changing as cheaper and more accessible options have begun to emerge.

Home to the youngest population in the world, the Global South has seen a swift adoption of blockchain-based digital assets to store and exchange wealth (see M-Pesa in Kenya), and also witnessed a rise in open web communities and developers. Recent research has demonstrated how a lack of established institutions, and limited infrastructure has positively contributed to a boom of blockchain solutions in Africa ([IFC, 2019, p.27](#)) It is no surprise then that in past years many African countries like Ghana, South Africa, and Kenya have been proactively pushing regulations to favour digital solutions aimed at facilitating new financial payment solutions and access to digital banking. ([IFC, 2019, p.29](#)).

According to a 2016 research project, focused on assessing the evolution of blockchain adoption across markets, the researchers declared that:

“DLT could have a strong impact in markets currently neglected or underserved by financial institutions, with a less competitive market structure and high verification costs” ([Catalini, Christian and Joshua S. Gans. 2016](#)).

This is a typical condition of many emerging economies. Distributed ledger based solutions can now address issues of currency instability and political risk, while also establishing digital identities, and creating new opportunities for startups and entrepreneurs outside the financial sector.

These developments have not gone unnoticed by venture capitalists who are on the

lookout for new opportunities. The Chief Executive Officer of IOHK and the head of the Cardano blockchain, Charles Hoskinson, has recently declared that Africa is the best place for DeFi:

“Given that the human capital, physical capital, and economics are all moving in the right direction, it is my belief that Africa will be the most promising economic environment in the next ten years” ([Charles Hoskinson, 2021](#)).

In the next few years, developing countries will likely find themselves at the forefront of digital and economic development, it is thus crucial for Western companies to recognise this potential and get involved in mutually beneficial cooperation to carve their spot in the industry before it is too late.

The Rise of Defi in Emerging Economies

Decentralized Finance or more simply DeFi refers to an ecosystem of financial applications developed on the basis of a distributed ledger managed by a decentralized group of stakeholders. From a high-level, DeFi allows for the creation of open-source, permissionless and transparent financial services (loans, payments, remittances, derivatives or investments) that are available to all and operate without any central authority¹.

DeFi is a very recent phenomenon. Only in the past couple of years has it started to evolve into a budding ecosystem of applications, with new products and protocols being developed each month. Already at the beginning of this year (2021) the TVL (Total Value Locked) of DeFi protocols reached an all-time high of \$18.35B.

¹ Note that there are different blockchains with different extents of decentralisation. Permissionless blockchain are completely decentralised, while private blockchains are centralised to varying degrees.



TVL Chart by [Defi Pulse](#)

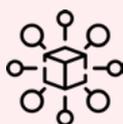
With DeFi, it is possible to carry out a variety of operations: To request or offer loans; trade cryptocurrencies on decentralized exchanges (i.e, Uniswap, Sushiswap, and 1inch), quickly convert one cryptocurrency into another; trade derivatives (i.e, Synthetix, Mirror, Shadows), and tokenize assets. While still in its infancy, the primary value proposition underlying the tokenization of real assets is that it allows for greater transparency, automation, accessibility, and traceability of services.

DeFi For the Developing World: The Real Value Proposition

DeFi makes traditional institutions such as insurance companies and banks look obsolete, as they operate through decentralised protocols that allow for the execution of operations through smart contracts within a blockchain. That makes the record open, permissionless, transparent and immutable. Such protocols crucially allow for an easier and more accessible interaction with financial products - for anyone with an internet connection. In more concrete terms, DeFi applications allow unbanked people to access services without going through lengthy bureaucratic processes offered by the current financial institutions. DeFi features:



Smart Contract Based



Decentralized



Permissionless



Transparent



Accessible



Non-Custodial: Your Keys Your Assets

Smart contracts are the backbone of DeFi as they enable simple functions, such as payments and credit, to more complex functions such as automated exchanges, trading with crypto assets and more. The interaction between different smart contracts serves efficiently all the basic financial functions also referred to as financial primitives, but importantly, they allow for entirely new DeFi use cases ([BitKom, 2020, DeFi: A new Fintech Revolution?](#)).

Digital wallets are another crucial component of DeFi as they allow for transactions on blockchains and currently there are various kinds that allow for different types of operations. However, major improvements are still needed in this respect for DeFi to attract more users: The most crucial being the need to build out an infrastructure to allow for compatibility between the underlying Layer 1 blockchain eco-systems used by different dApps.

In developing countries the adoption of e-wallets is growing exponentially by the day, as they provide more security than paper money, and greater opportunities of accessibility to the global marketplace. They are a great tool to empower the unbanked and those that do not have the economic or intellectual resources to access financial products.

Remarkably, in countries like Kenya more than half of the adult population has an M-Pesa wallet, an e-wallet created by Bitpesa, a company providing foreign exchange and business-to-business bitcoin based payment services ([IFC, 2019, p.35](#)).

These applications have the potential to revolutionize approaches to finance, and ameliorate unnecessary middle-man services by improving transparency and accessibility. In a context where access to financial products and banking services taper off economic growth, more efficient solutions are actively sought after and adopted with eagerness.

Developing Economies are Embracing the Revolutionary Potential of Cryptocurrency

The potential of DLT and the importance of Building an Open Web is much more present in developing countries that for decades have been at the outskirts of technological development. The awareness of the opportunities that these advancements will bring with them is significantly more mature in developing economies:

“The opportunity is to produce new constructs that bring together unique opportunities and competencies —things like the blockchain and mobile-money movement on the phone, and mesh networking. It’s a matter of using Africa’s unique potential right now to come up with things that defy Western logic in many terms or just don’t fit that classical model” (Brett King, co-funder of Moven).

The rise of Web3 not only signifies new opportunities for development but also constitutes the opening up of new models that better respond to the needs of the population, and most importantly, as a tool to propose new visions and approaches to a country's future.

“[Traditional financial institutions] are going to try and keep the traditional CFI out by giving you a centralised form organised by them which still requires their permissioning. Which is why I said it is going to start in the rest of the world and it’s going to grow so big in the rest of the world that it’s gonna be forced on us. We are gonna look and we are gonna say: “To do any business outside the US we need to do business in this DeFi world”, and that, with the world that we have, is just hamstringing us and putting us at a competitive disadvantage. That’s my fear, is that they will not let it go and they will not embrace it. [...] That’s just gonna keep the US behind the rest of the world that’s all its gonna do. We should be talking about tearing down some of the suffocating rules that we have which keep the costs up, which keeps the system unfair, which keeps everybody shut out, but they are not thinking of it that way. Everybody thinks how do I protect my own turf with as little disruption as possible that’s what I think traditional banks are gonna do and that’s why it’s gonna be forced on them and not that they are going to be leading the way. Maybe some Fintechs might lead the way, maybe some companies that do not exist might be leading the way maybe some of the silicon valley companies might lead the way.. It won’t be traditional finance”.

([Jim Bianco](#), 2021, 29.15/30.30)

As the quote above attests to, attention to DLT adoption in developing countries is rising together with the awareness that emerging economies display the right characteristics for fast adoption and growth. Continents like Africa and Latin America have traditionally been affected by lack of economic inclusion, high inflation, corruption and inefficient payment systems, all aspects that can be efficiently tackled thanks to DLT. It is not surprising then that the use and perception of this technology is welcomed.

In fact, a recent survey conducted in fifteen Latin American countries has shown, there is a strong openness from financial institutions towards DLT solutions:

“85% of all survey respondents, including executives from financial institutions, fintech leaders, and legal advisors, view blockchain as a future opportunity for their organizations to improve business operations and provide better services to their clients” ([Algorand, 2021, p.26](#)).

DLT has already demonstrated its value in creating efficient solutions to concrete problems. As successful use cases continue to increase (see Koibanx, Bitfy, Valiu in the Latin American context) there are reasons to believe that Defi will continue to swiftly expand in emerging economies, bringing tangible economic and social benefits with it.

Emerging Economies Tapping Into The Future of Software Development

Despite the economic crisis of 2008-2009 the software industry has continued to grow and expand. This is due to the specific nature of software development: It is largely indestructibility, easily transmutable, and quickly reproducible. As a result, it is largely protected from fluctuations in global markets. In some case studies (eg. Croatia) researchers observed a negative GDP growth rate in a country going through an economic crisis, while production of software between 2008-12 continued to increase.

Moreover, the results of the studies have shown a significant comparative advantage of investing in the software industry in developing and transitioning countries. That is reflected today, by technology companies actively investing in outsourcing software development to: India, Ukraine, China, Poland, The Philippines, Romania, Brazil, Taiwan, Africa to name a few.

If Crypto Becomes The Reserve: If crypto becomes the global reserve currency for a new economic system, the national currency of a country will become less important, and interference from a government would be limited. It is in this brave new world that software developers hold the power to create new financial and social opportunities for citizens to spend and accept global, distributed, and private cryptocurrencies in everyday life.

In line with these trends, as the industry rises in commercial importance, so does the number of developers learning to write and ship code: A [2020 Global Developer study](#) suggests that there are 26.9 million developers around the world and by 2030 that number will increase to **45 million**. As the study goes on to explain:

"We can expect an approximate 75% growth in the number of software developers worldwide in the upcoming decade" ([Future Processing Business Blog](#))



Case Study: Kenya

When [Microsoft launched their first African Development Centre \(ADC\)](#) in Kenya and Nigeria, the urge to nurture and recruit more homegrown software development in the country sprung forth.

“Our desire is to recruit exceptional engineering talent across the continent that will build innovative solutions for global impact. This also creates opportunities for engineers to do meaningful work from their home countries and be plugged into a global engineering and development organisation” ([Microsoft News Centre, 13 May 2019](#)).

Regardless of whether Microsoft’s intentions for setting up their development centers in Africa are completely altruistic, this gesture signals an opening up of opportunities in the region. Today Africa counts more than 690,000 professional developers, [60,000](#) of which are coming from Kenya. ICTS in Kenya is booming:

“A recent World Bank report showed Kenya’s ICT sector’s growth has outperformed every other sector, expanding by over 23% annually during the last decade only...Kenya is currently one of Africa’s fastest growing ICT markets where ICTs have increased productivity in all spheres of production process and enabled expansion of skills, contributing to improved standards of living for Kenyans. According to the Economic Survey 2020, the value of the telecom sector expanded by 10.3% from \$3,870mn in 2018 to \$4,270mn in 2019” ([Kenya Country Commercial Guide, International Trade Administration, 13 September 2020](#)).

The Ministry of ICT in Kenya launched the [National Broadband Strategy \(NBS\) 2023](#) with the goal to transform Kenya’s emerging economy into a knowledge-based economy. By 2023 the government aims at improving high speed internet connection to 94% of the population and increasing digital literacy at school to 85% and to 50% amongst the

workforce. Faster and more reliable internet connection in Kenya will make it extremely suitable for the upcoming Open Web solutions.



Case Study: Bangladesh

Bangladesh is an emerging software exporter that manifests its impressive potential for the world of the Open Web. The government of Bangladesh has outlined 4 key pillars of their vision in 2021: (1) Preparing human capital for the coming all-encompassing digitalization, (2) Connecting citizens, (3) Optimizing online services and (4) Making the best use of technology to help the private sector become more competitive. Each of these demonstrate engagement from Bangladeshi authorities as well as a rather high level of professionalism from the local IT sector:

According to Syed Almas Kabir, president of Bangladesh's IT companies' association BASIS, many firms are getting involved with new technologies like the Internet of Things (IoT), artificial intelligence and blockchain. Demands for more services in these areas will increase, he told DW, adding that universities also needed to modify their subjects to cater to new demands. As a whole, Bangladesh has earned about \$1 billion (around 890 million euros) in the last year through its IT services, according to BASIS. The government now wants to earn \$5 billion (around 4.4 billion euros) within 2021 ([Faisal, A., 14 May 2019](#)).

Indigenous IT companies in Bangladesh are actively improving the infrastructure in the country and continuously attract attention from all over the globe. These native companies rapidly disrupt the economic and political status quo by introducing up-to-date technology locally and beyond its border (e.g. [DataSoft](#) introduced an IoT-based toll management system in the Democratic Republic of Congo, a voter registration system for Nepal that has been developed by [Tiger IT](#)). The technological ambition in the

regions like Bangladesh and Kenya is becoming so strong that very soon their software industry will omit the “emerging economy” labels, transforming them into leading world players.

Escaping Software Colonialism and The Underrated Potential Of The Open Web

Open-Source blockchain-based ecosystems are rapidly expanding the tools and principles of the Open Web. Free Open Source Software (or FOSS) is one of the most notable principles. The beauty of FOSS is that anyone with internet connection can inspect the code and improve upon it. For many developers from the industrialized and developed parts of the globe, having free-license code is a nice bonus. Meanwhile, engineers from regions like Kenya and Bangladesh have a unique opportunity to reap the greatest benefit in quickly and easily using such open-source software for upgrading and improving existing commercial and social processes.

From **the legal angle**, FOSS provides higher security. The Western world is not often exposed to the failures in their systems because their systems continue to work for the most part. And, even when they do not, there are at least some kind of regulations in place to prevent a complete breakdown. Identity verification based on DLT can be effectively used for passport management, birth and marriage certificates, ID cards and voter cards, electronic management of residence permits as well as land tenure.

From **an economic perspective**, FOSS stimulates huge gains in efficiency which are critical for the technological and economic growth in developing countries. A massive window of opportunity is opening up for the software entrepreneurs from the global south.

Next to increased efficiency, there is a lot of **entrepreneurial opportunity**. Startups have more freedom to innovate and be creative due to the reduced financial barriers to

entry and the value of network effects and feedback loops in protocol-level ecosystems. The more local software development FOSS catalyzes, the more local employment takes place. Higher employment rates means more income generation and therefore a stronger economy. In spite of the COVID pandemic, 2020 has become a record year for investments in the African tech startup ecosystem with [397 startups raising 701.5 US\\$ in total funding](#).

Last but not least, when citizens (and especially developers) are able to collaborate in a permission-less manner using the Open Web, developing countries can steward local **knowledge-sharing communities**. Adopting FOSS ensures an exponential learning curve where highly qualified experts are quickly educated, and more importantly, they are provided with job opportunities. Turning a “brain - drain” into a “brain- gain” can improve local markets’ ability to respond to local needs more accurately. Developers can quickly adjust to homemade modifications and develop necessary products without feeding information outside the country.

In A Nutshell: Why Should We Pay More Attention to All of This?

The transition of the Global South to blockchain-based digital assets and solutions captures a lot of attention from the Western World. Because of their lagging or simply non-existent infrastructure, developing countries are mega suitable to welcome DLT and Open Web adoption. We discussed earlier how rising DeFi not only enables tools like smart contracts and digital wallets to optimize a variety of financial procedures, but it also empowers a digital token model of asset ownership and transactions, while challenging the existing financial system to be more transparent, accessible and innovative.

DeFi can help developing countries leapfrog into modern society and solve problems in traditional finance that have been traditional barriers to investment, access to capital, and entrepreneurship. Together, DeFi and cryptocurrencies can compete with

traditional finance to continuously improve financial services in an open-source and accessible manner. Along with DeFi, FOSS is another catalyst which brings a whole new value to the emerging economies. The explosive development of the software industry, the massive diffusion of DLT and the upcoming Open Web revolution is a combination that will skyrocket the overall digitalisation and development of regions that are more than ready for a transformation. Before it is too late, the global north would do well to build on such momentum and help bring emerging economies onto the international scene - where they deserve to be.

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