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The Missing 1.1 billion: Blockchain-Based Digital Identities as a Driver of Inclusion

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In the developed world, possessing a government issued identity document is taken as a given for most people. From holding a birth certificate to a passport, it is not often that one pauses to think about the privilege of living in a country where a majority of the citizens are visible to the state. Reality is very different for an estimated 1.1 billion people across the world. 1 in 7 individuals possess no official record of their existence. [1]

Importance of Legal Identity

While possessing a mere piece of paper might not seem particularly important, the significance of these documents becomes apparent when one evaluates the living conditions of these excluded citizens. Having worked with the transgender community in Bangalore and refugee camps in Paris' La Chapelle, I have witnessed first-hand, the travails of people living a life of exclusion. Without a government issued ID, these citizens can struggle to access education, healthcare, social benefits, political and legal rights all of which have a lasting impact on one's quality of life.

It is impossible to build a just society while leaving behind a seventh of humanity. This has been recognized by the international development community and is reflected in the United Nation's Sustainable Development Goals (SDGs). The UN SDG target number 16.9 is, "by 2030, provide legal identity for all including free birth registrations." A closer evaluation of the SDGs reveals that the achievement of up to 12 of the 169 SDG targets would be strongly affected by universal access to legal identity. [2]

Preliminary results from government e-Identity programs across the world reflect the immense potential of digital identity programs to empower the most vulnerable sections of society. As highlighted in our earlier [blogpost](#), India's digital identity program, Aadhaar, has facilitated the opening of 309 million new bank accounts since August 2014. [3] Just across the border, in Pakistan, direct cash transfers to the bank accounts of women has proven to be a strong driver of women empowerment. [4]

Where Governments Fall Short

However, governments sometimes fall short of ensuring universal access to identity within their jurisdictions. This may be attributed to the following reasons:

1. Exclusion of citizens from national identity programs is often a consequence of a national government which lacks the resources ensure universal access to digital identity. The total expenditure of the Government of India on the Aadhaar program is estimated to be around USD 1.5 billion to date. [5] Such costs can prove prohibitively expensive for several countries which lack the financial resources.
2. Exclusion from national identity programs could also be a consequence of discriminatory policies against a particular community by the government. Consider the case of Myanmar's Rohingya community: the Burma Citizenship Act of 1982 failed to recognize the Rohingya community as citizens, thereby rendering them stateless. [6] Subject to discrimination and violence in Myanmar, an estimated 3.5 million Rohingyas have fled the country. [7] With a majority of these citizens devoid of legal identity, they are largely excluded from government services and economic opportunities, thereby living in pitiable conditions.

The Promise of Blockchain-Based Digital Identity

In several cases, NGOs, supranational organizations and other services such as social media have been able to reach citizens where governments have failed. For example, vaccination centers could serve as a vital point of identity issuance. The global child vaccination coverage today stands at 86% with diverse actors including private and public medical centers, NGOs and supranational development organizations all playing a vital role. [8] At the same time, among the 671 million children aged under 5, over 180 million children lack legal identity. [9] [10] This translates to around 27% of children under 5 lacking legal identity compared to the 14% of children not covered by vaccinations. Thus, engaging vaccination centers as verified identity issuers could significantly reduce the number of children lacking legal identity.

Vaccination centers in the remotest regions often tend to be affiliated to larger organizations such as the government and aid agencies. For instance, Gavi, the vaccine alliance composed of members such as Bill & Melinda Gates Foundation, WHO, UNICEF and The World Bank, supported the vaccination of 62 million children in 2016. [11] Thus, a child could possess an identity document issued by such organizations of international standing as against a national government issued identity. As the child progresses through life, it could accumulate stamps of approval of its identity from other recognized institutions that it interacts with such as a school, eventually adding up to a digital identity which is equally or more reliable than a government verified identity.

In an earlier [blogpost](#), we briefly explored the potential of personal data to address the issue of identity for refugees. For example, a refugee seeking asylum from conflict could use one's geolocation data as a proof of origin from a recognized conflict region and social media data to prove that the person enjoyed a normal social life, thereby providing the host country with data which could hasten the integration of the person into the country. [12]

Blockchain serves as a game-changer by eliminating the need for a centralized authority to verify and securely store records of the above-mentioned digital identities. By creating an ecosystem of trusted identity verifying nodes, identity verifiers can digitally sign and immutably store a hash of the verified identity claims on a public-permissioned blockchain. Hashes of a digital identity stored on a publicly readable blockchain would

readily enable third-parties to check for the authenticity of an identity holder's claims while still keeping the attributes which constitute the identity, secret from the public.

In fact, one could even envision a public-permissionless identity blockchain where everyone is allowed to participate in the process of identity verification. It would be fair to say that my neighbor can attest claims about my "residential address" with a greater degree of reliability than the government or any other institution. Such a system can be insulated from misuse through a sound reputation engine which incentivizes identity verifiers to act in good faith. While such a degree of decentralization has the potential to take us close to the goal of universal access to digital identity, a trustless ecosystem which would protect the integrity of the identities from malicious actors still remains an unsolved design challenge.

Through decentralization, blockchain based digital identities have the potential to solve the two key problems identified in the previous section:

1. **Governments with a lack of resources:** The creation of a trusted ecosystem of identity issuers, would help governments share the resource burden of ensuring access to digital identity with other actors in the ecosystem. Furthermore, A number of open-source digital identity platforms are currently in development. This would enable actors in the identity ecosystem to build solutions tailored to the ground-realities of the community, upon the foundation of such open source platforms. By lowering the barriers to entry for innovators, open platforms can catalyze frugal innovation and consequently, lead to impact at scale. (O'Reilly, 2010) [13] Beyond the theoretical basis highlighted above, India's Aadhaar program serves as an empirical example of the power of government platforms to foster inclusion and empowerment at scale. Unlike the Indian case however, the emergence of open-source digital identity platforms, eliminates the need for large investment in the core IT infrastructure which came at a significant cost to the Indian government.
2. **Discriminatory Government Policies:** By immutably storing the hashes of one's identity attributes on a distributed ledger, blockchain-based digital identities have the potential to disrupt the status quo where governments are the sole custodians of a citizen's identity. The Rohingya community was retrospectively rendered stateless by the Burma Citizenship Act of 1982. While blockchain-based digital identities do not have the power to influence the communal tensions which trigger such discriminatory moves by governments, the plight of the Rohingya could have been different if their once legal identities were securely stored on a distributed ledger. Evidence from the past four decades have shown that Rohingyas who were able to prove their identities to asylum-granting countries have faced a friendlier existence than their peers who failed to. The creation of a decentralized identity verification ecosystem would enable citizens to construct their digital identities in a self-sovereign manner as highlighted with the vaccination and refugee examples in the previous section. This could thereby protect citizens from being stripped of their identities by a single authority overnight as was the case with the Rohingyas.

Conclusion

While the potential held by blockchain-based digital identities to facilitate inclusion at scale is apparent, it is worth noting that realizing the possibilities highlighted above would depend on a multiplicity of factors, paramount among which is the evolution of the underlying technologies. Blockchain and more specifically, blockchain-based digital identities still remain largely experiments and haven't yet been proven at scale. With the number of different blockchain-based digital identity projects currently in development, it

Is vital that these actors cooperate to establish standards which enable interoperability between the many platforms.

The privacy challenges faced by India's Aadhaar program provide another key lesson. The undoubted development potential held by digital identities also bring with it the risk of surveillance and a violation of privacy. It is thus crucial that blockchain based digital identity platforms place the privacy of its users at the

forefront. Users must always enjoy self-sovereignty over their personal data stored and transmitted in the digital identity ecosystem. Article 25 of the EU GDPR offers guidelines on “data protection by design and default” and Article 42 defines the certification mechanisms that may be used to demonstrate compliance. [14] These guidelines however fall short while specifying guidelines specific to the challenges posed by blockchain.

The value of any identity lies in the access to services that it enables. Thus, beyond establishing ethical boundaries for the development of the technology, on a more basic level, regulation must first establish laws which allow service providers to accept blockchain based identities as an access key to their services.

Blockchain-based digital identities can form the foundation of a fairer future. But this future will remain elusive unless the diverse stakeholders – regulators, technologists, social development workers and citizens among many others – come together to make this a reality. Beyond being an exploration of the possibility of an inclusive future, this post is a call for cooperation to answer the questions that remain. Join us in our mission to build a future that leaves no one behind.

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