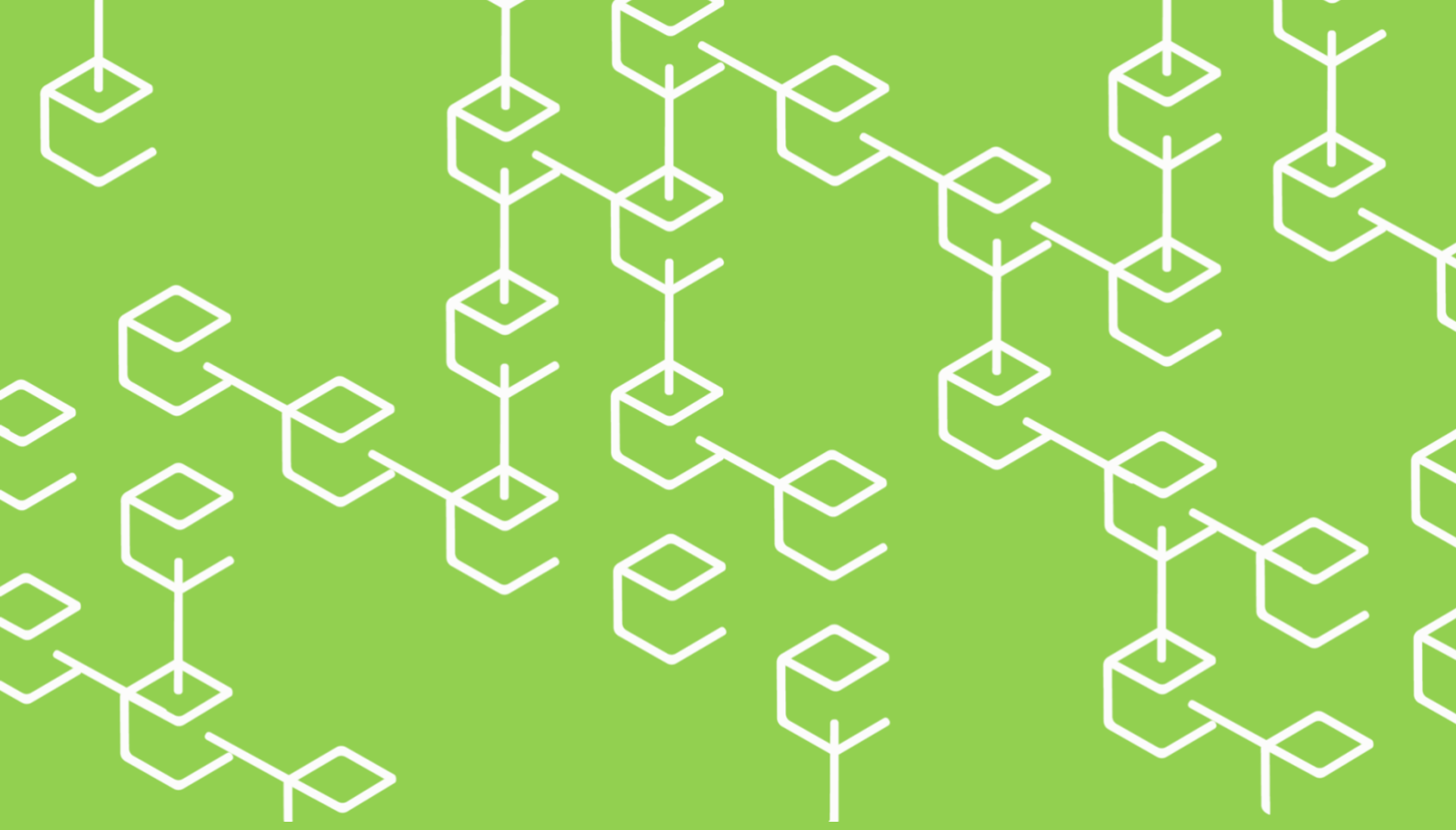

Vaccify

A Vaccination Passporting Ecosystem

Concept Paper

Scope

COVID-19 has severely affected our socioeconomic balance, way we live, do business and interact with others around us. The world is not going to be the same again, even when we recover from this pandemic. We face a stark situation whenever we interact with people, places, or things. These trust issues have become even more critical as the governments around the world have announced lockdowns to be lifted, and life progressively starts to function minimally.

With the arrival of the COVID-19 vaccination in Pakistan, there will be an immense need for rehabilitating the socioeconomic norms of society by opening offices and allowing international and domestic travel as fast as possible. As countrywide immunization can take years in Pakistan, In the phase of transition where the population is being immunized while a significant amount of people are not vaccinated a vaccination governance model will be required. The railways, airports, aviation industry and others will need to know who has been vaccinated to travel domestically or internationally. Companies will need to prevent further spread of virus once employees start returning to the office. As not knowing who is vaccinated and who isn't will make eradicating COVID-19 virus even more difficult. Informal trust is essential as a society. But it takes more than just goodwill, common sense, and manners when a life-threatening pandemic surrounds us. **Governable and digitally provable trust is required**.

Using a blockchain-based digital identity trust framework, we can enable healthcare facilities and laboratory services all across Pakistan to issue digitally-signed vaccination certificates or SARS-CoV2 test result status to a person directly to their smartphones. With a quick touchless scan of a QR code either online or face-2-face, a person can prove that they are virus-free or have been vaccinated (once that is available). This special digital certificate can maintain people's data privacy and confidentiality by having only consented and limited personal information. It provides strong cryptographic proof that a certificate belongs to that person, eliminating the need for paper-based proofs. Such a digital certificate would be massively harder to fake or spoof than any paper or plastic credential. And it can be issued in seconds—and revoked in seconds if needed. Moreover, its trust interoperability would be international, meaning a **digital certificate issued in Pakistan can be verified and trusted anywhere in the world without need of any**

integrations as shown in figure 1. Such properties make a solution like this **low-cost, scalable and privacy oriented.**

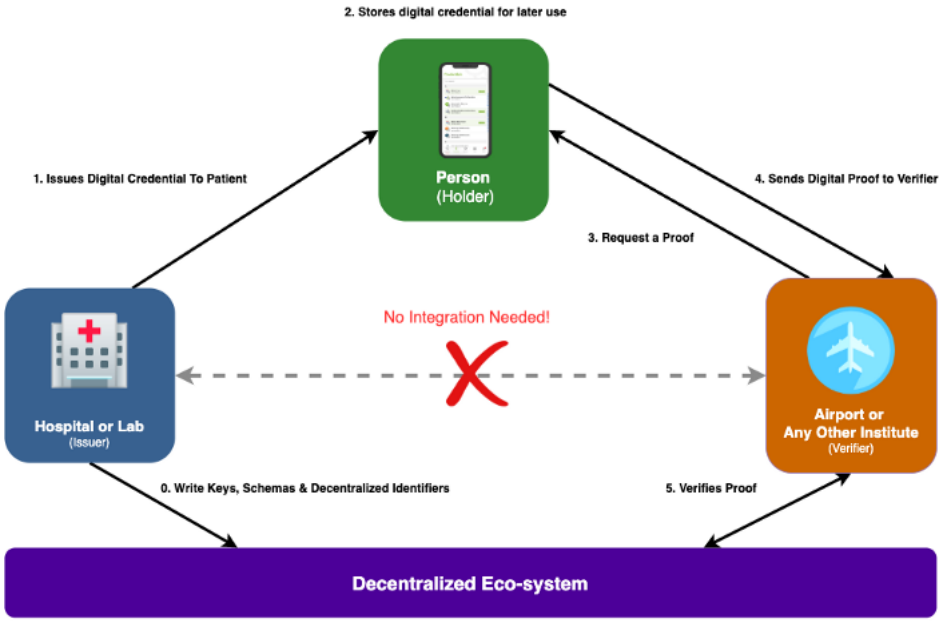

Figure 1: Proof of vaccination issued to patient by hospital and verified by airport without any integration and by using a public-permissioned open-source blockchain.

COVID-19 Vaccine Passporting Use Case

This section explains COVID-19 vaccine passporting use case via decentralized identity that is relevant in the context of Pakistan.

Proof of immunity by vaccination

Amina wants to prove, either face-to-face or remotely, that she has been vaccinated against COVID-19 (e.g., so she can book a flight ticket and travel). She goes to her local hospital and gets vaccinated for COVID-19.

Hospital issues a digital certificate to Amina which she automatically receives to her smartphone. As the hospital is enabled with Vaccify's blockchain based self-sovereign identity system, Amina is now owns of this digital vaccine certificate in her mobile wallet app similar to if she would been given a paper based certificate. But this certificate being

digital and decentralized it has some special features. Such as its **tamper-proof** and has ability to be digitally provable and trusted nationally and internationally, where paper based certificates would fail.

Now, Amina goes to an airlines website to book a flight ticket. Airlines want to make sure if Amina has proper vaccination, if she does, then she is allowed to book a ticket. Amina scans a simple QR code provided by Airlines website and now airlines have verified a digital cryptographic proof that she has been vaccinated. This tamper-proof digital credential can be trusted with full autonomy. Moreover, Amina can also provide a face-2-face proof prove of her vaccination while boarding her flight just by scanning a simple QR code. This solution is highly scalable and low-cost when implemented nationwide, moreover there is no need for system to do complex integrations with each other figure 2 shows high-level flow of digital vaccination certificate issuance and verification.

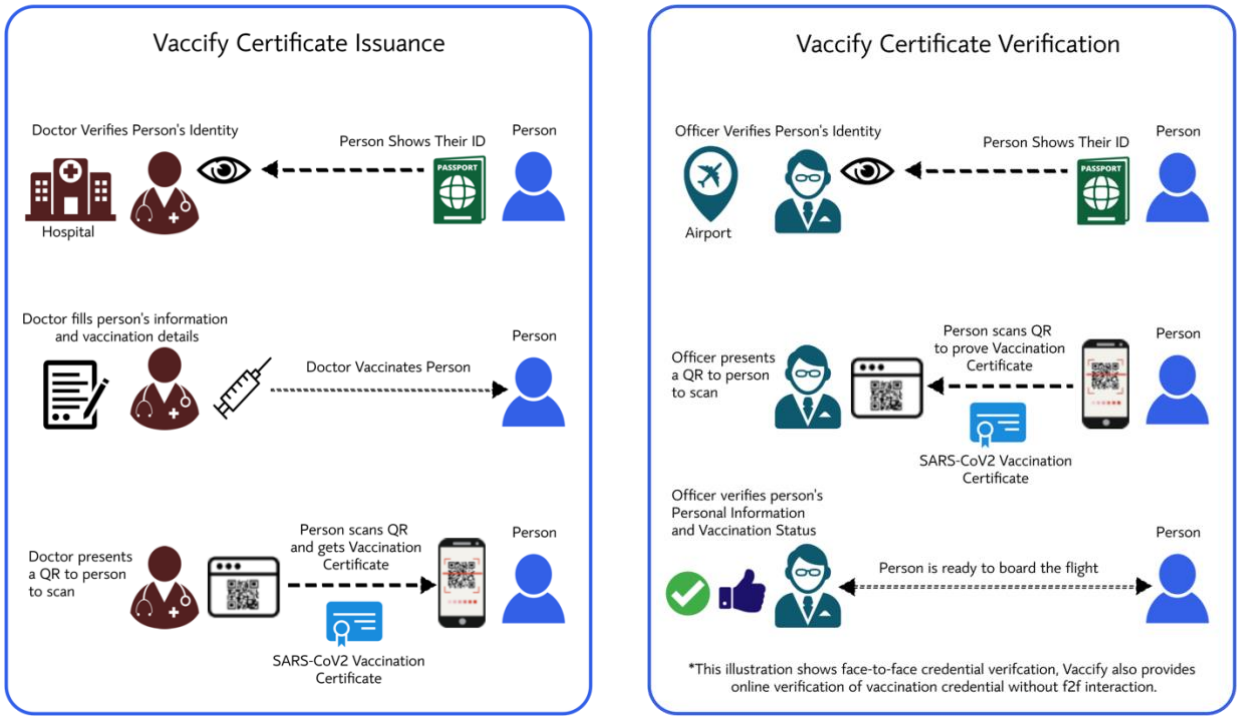

Figure 2: High-level vaccination certificate issuance and verification flows

Vaccify — An open-source Initiative

TrustNet Pakistan initiated an **open-source**[1] COVID-19 initiative **Vaccify**[2] to tackle the pandemic's digital trust challenges in Pakistan. The vision behind this initiative was to purpose a *Self-Sovereign Identity* and *Blockchain-based* digital vaccination ecosystem. This proposed ecosystem will enable the public-private sector to work in collaboration to provide digital vaccination identities to people who are vaccinated (once the vaccine is available for SARS-CoV2) and verify them on demand.

It is a Blockchain-based digital identity solution for all healthcare institutes, laboratories, and testing facilities across Pakistan. Its purpose is to enable them to directly send digitally signed credentials containing people's COVID-19 vaccination status to their smartphones. It also facilitates the governance of vaccination passporting by allowing the institutions like aviation authorities or commercial airlines to verify people's vaccination status, ultimately helping society to return to the norm and function in a seamless manner. TrustNet Pakistan is already part of a global initiative called 'COVID Credential Initiative'. Our Solutions is based on decentralized credentials model called 'Verifiable Credentials' (VCs) and based on world wide web consortium (W3C) standards.

The international organizations across the globe have proven the technology and the standards we are using. Verifiable digital credential technology is already powering several vital projects, spanning government (verifiable public directories), financial services (banks, credit unions, FinTechs), healthcare (doctor onboarding), humanitarian services (portable identity for refugees, privacy-preserving HIV testing), and many other sectors.

[1] https://github.com/TrustNetPK

[2] https://vaccify.pk

About TrustNet Pakistan
TrustNet Pakistan is a nationwide industry-networked initiative focused on aid to building blockchain-based ecosystems around personal data management, based on Self-Sovereign Digital Identity (SSI). This TrustNet is the foundation for markets that deals with personal data, as it enables individuals and organizations to control the flow of their private data across different business sectors and industries. It establishes the fundamental building blocks for creating new personal data-centric services.

It is intended for the Pakistan business industry to gain national and international competitive advantage on blockchain-based digital identities. This fascinating new technology that has strong cross-industry potential. Still, it must be trialed to establish the market lead. TrustNet PK dedicatedly invests in arranging cross-industry trials, open-source contributing, Self-Sovereign identity community building, releasing proofs-of-concept, and educating the market about Blockchain and Self-Sovereign Identity (SSI). We believe that together we can accelerate Pakistani industry players to adopt SSI and help build interoperable decentralized ledger-based trust networks.

Our findings, suggestions, and resolutions are originally proprietary to our consortium members and conclusively released to the public in support of our mission. To find out more, please visit https://www.trust.net.pk.