Name: PA PICHSAKANYA

Class: Afternoon

Assignment

Write 2 pages "How immutability protects Digital Identity"

Our lives are now deeply connected to the digital world. From logging into social media and managing bank accounts to storing school and medical records online, much of our personal identity exists in digital form. This shift has made life more convenient, but it also exposes us to serious risks. Data leaks, online scams, and identity theft are becoming part of everyday headlines. As we rely more on digital systems, ensuring the security and integrity of our identities has become essential. A key approach that helps achieve this is immutability.

Immutability is the idea that once data is written, it stays the same forever. Instead of changing or deleting what already exists, any new information is simply added as another entry. This creates a full and transparent record of everything that has happened. It's one of the main reasons blockchain technology is trusted data is stored across many computers rather than in one single place that could be hacked or altered. When used for digital identity, immutability helps make information secure, traceable, and almost impossible to fake.

The problem with most identity systems today is that they are centralized and easy to manipulate. Governments, companies, and online platforms all collect and store our data in their own databases. If one system is compromised, millions of identities can be stolen at once. Even people who work within those systems can misuse their access to change or delete information. On top of that, every time we sign up for something new online, we give away the same personal details again and again, losing control over where our data goes. This centralized and mutable setup creates weak points that hackers and criminals can easily exploit.

Immutability changes the picture by making identity data tamper-evident and trustworthy. On a blockchain, every action such as creating a profile, issuing a certificate, or changing a detail is recorded permanently with a unique digital signature. For example, when a university issues a degree, a special code (called a hash) of that document is stored on the blockchain. The real file stays with the person who earned it, but the hash on the blockchain proves it's genuine. If anyone tries to alter the document, even by a single character, the hash will change and instantly expose the forgery. This makes it nearly impossible to fake credentials or alter official records without being caught.

Another strength of immutability is that it keeps a complete history of every identity record. Old information isn't erased when something new is added instead, both are preserved in a chain of trust. This allows anyone who needs to verify a credential, like an employer or financial institution, to check not just the current data but also its entire history. Because this system is decentralized, there's no single database for hackers to target. The trust comes from the technology itself, not from one company or government controlling it.

A growing example of this concept is Self-Sovereign Identity (SSI). This approach lets individuals take ownership of their digital identity by keeping their verified credentials in a secure digital wallet. When proof of identity is required, the user can share only what's necessary instead of exposing all their personal information. For example, if someone needs to prove they're old enough to enter a venue, their wallet can confirm they're over 21 without showing their exact birthdate or address. This gives people privacy and control while still allowing verification.

In conclusion, immutability plays a major role in protecting digital identity. It prevents tampering, strengthens trust, and returns control of data to individuals. As our world becomes more digital, immutable systems can help ensure that our online identities are authentic and safe not something that can be easily stolen or changed. By combining technology, transparency, and personal control, immutability protects not just our information but also our digital selves.