

The Power of the Blockchain to Manage Passports, Visas, and Immigration

Passport, visa, and immigration processes are complex and becoming even more so in a new era of hybrid work in which employees frequently travel to international offices and work remotely, and freelancers are a team staple. Technology is driving this new way of working; however, the border-crossing process remains painfully erudite. While the world has changed in many ways, the passport and visa process can be difficult, slow, and expensive.

We're starting to see signals that change is on the horizon. Governments and technology companies are partnering for the first time to explore how changes can be made to streamline, expedite, simplify, and secure processes around passports, visas, and immigration.

A particularly exciting possibility is integrating blockchain technology and decentralized networks to fundamentally transform the landscape of passports, visas, and immigration from unwanted hassles to efficient, user-friendly experiences.

These technologies are gaining traction within the travel technology community, with innovators building sophisticated travel e-commerce and distribution platforms on blockchain.

When it comes to the nitty-gritty of travel documentation and immigration, however, adoption—and even acknowledgment—of web3 technology is still in its infancy. There is significant potential for travel companies and governments to leverage web3 technology for improved data privacy and streamlined border-crossing processes.

If web3 technology becomes a fundamental building block in future iterations of passports, immigration, and visa policy, new technologies and frameworks could fundamentally alter the landscape as we know it.



Blockchain Technology: Foundations and Capabilities

Blockchain is a distributed ledger technology that records transactions with an immutable cryptographic signature called a hash. Once a piece of information is added to the blockchain, it cannot be altered, promoting and ensuring a level of data integrity unprecedented in digital transactions.

Blockchain technology is built on the tenets of decentralization, transparency, and data security.

Decentralization: Unlike traditional databases managed by central authorities, blockchains are distributed across a network of computers, making them resistant to single points of failure and less susceptible to manipulation or control by any single entity. This aspect is particularly appealing in the context of international travel and immigration, where multiple stakeholders are involved.

Transparency: While personal data on a blockchain can be kept private, the transactions themselves are open to verification by anyone in the network, ensuring a transparent process. This

transparency can be instrumental in building trust in the efficiency and fairness of travel and immigration processes.

Data security: By its design, a blockchain is inherently resistant to modification of the data it contains. This security aspect is crucial when considering the sensitive nature of personal data involved in passports, visas, and immigration processes.

Several nations are at the forefront of adopting blockchain technology. For instance, Estonia pioneered blockchain for governmental services, including healthcare, judiciary, and security. Their e-residency program is a prime example of how a government can leverage the blockchain to manage digital identities—a concept that can extend to travel documents.

Similarly, countries like Singapore and the United Arab Emirates are exploring blockchain for various applications, including smart contracts and digital identities, which could have significant implications for immigration and border control.

In Dubai, the government has an ambitious plan to put all its documents on the blockchain by 2025, which could transform how governments handle data and interact with citizens.



The Current State of Travel Documentation and Immigration

The current state of passport and visa management is complex, challenging, and inefficient, often resulting from outdated systems and clunky interactions between governments, airlines, and government-controlled border enforcement agencies.

Traditional immigration processes are governed by legacy systems. The process typically begins with an application for a visa or a passport, followed by verification, including background checks and the validation of various documents. The application process is slow and cumbersome, with varying regulations across different countries.

The continued reliance on a paper-based system presents numerous challenges: Passports, visas, birth certificates, and other personal documents are susceptible to damage, loss, forgery, and theft. Over 300,000 American passports are reported lost or stolen each year—a small percentage of the 150+ million in circulation but still a significant threat to security.

In the United Kingdom, the government reports that, of the almost 50 million UK passports in circulation, approximately 400,000 (<1%) are reported lost or stolen each year.

And yet, while passports and visas remain predominantly physical, their management and verification rely on large, centralized systems. These databases, often siloed within the confines of national borders, struggle to communicate with each other, leading to inefficiencies, delays in information verification, and traveler frustration.

The current systems are hugely limited in the degree to which they can ensure data privacy and security. In an age where data breaches are not uncommon, the centralized storage of sensitive personal information raises significant concerns. The potential for data breaches in these vast repositories of sensitive personal information is a constant threat.

“The existing framework of travel documentation and immigration, with its reliance on physical documents and centralized databases,



is inefficient and struggles to meet the growing demands for data privacy and security,” says Carsten Ostberg, Chief Strategy Officer at CIBT Visas.

As the world moves towards a more interconnected and digital future, the need for a more streamlined, secure, and user-friendly system is evident, and emerging technologies like blockchain offer promising solutions to revolutionize this domain.

Blockchain in Passports: A Digital Identity Revolution

Blockchain technology has opened the door to a significant transformation in handling passports and managing identities. Blockchain’s inherent attributes of decentralization, immutability, and transparency make it an ideal candidate for enabling secure and verifiable digital identities.

Blockchain facilitates the creation of verifiable credentials, such as passport information, which, when stored on a blockchain-enabled platform, travelers can share specific data as needed. The result is enhanced data privacy and compliance with regulations like GDPR. The immutable nature of blockchain ensures that once information is recorded, it remains unalterable, instilling trust in the authenticity of digital identities.

At the forefront of this revolution are several companies that are pioneering digital identity solutions. Airside, for instance, has developed a mobile application that allows users to control their digital identity and share it securely. This technology uses blockchain to ensure the data is tamper-proof and verifiable.

This is just the beginning. The potential for blockchain in revolutionizing passports is immense.

While experts predict that we’re still 5-10 years away from a complete system overhaul, technology is starting to shift the process around travel documents.

There will be gradual evolution that will likely happen by region. It will become more accessible and easier to travel within an area,

such as Latin America or the European Union before regions start to form agreements and passports can disappear as an entity entirely.

“This is a positive development that will simplify travel for governments and individuals and likely reduce travel costs by removing a major portion of infrastructure costs,” says Ostberg.

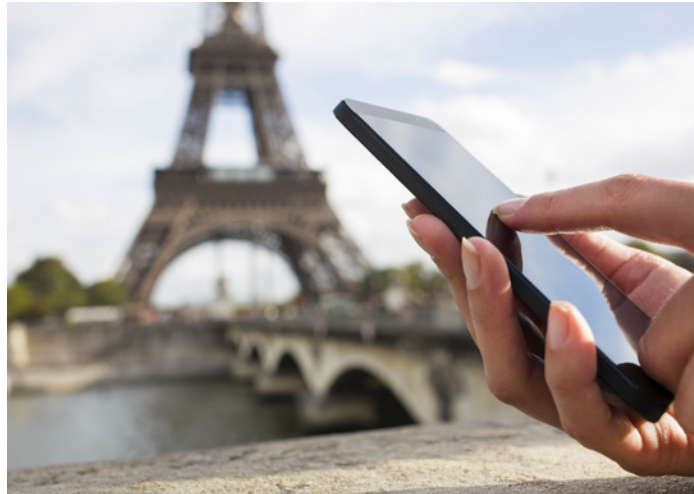
The benefits of digital passports extend far beyond mere convenience. They promise enhanced security, as blockchain’s architecture makes them virtually immune to tampering and fraud. They also improve data privacy and mitigate concerns associated with sharing personal information.

Visa & Immigration Management on the Blockchain

Beyond basic business and leisure travel, blockchain’s decentralized ledger holds the potential to establish a transparent process for visa issuance and immigration.

Blockchain’s integration into visa and immigration management paves the way for global standardization through smart contracts, bilateral travel corridors, and collaborative efforts across various stakeholders.





Bilateral travel corridors refer to agreements between two countries to facilitate travel by streamlining processes, often for specific purposes like business or tourism. In the context of blockchain and immigration, these corridors can serve as testing grounds for implementing innovative technologies.

Successful implementation and collaboration in these corridors could pave the way for a more extensive, unified ledger system—revolutionizing how immigration workflows are managed globally with unprecedented emphasis on transparency, efficiency, and security.

Stakeholders could expedite this process by applying smart contracts—self-executing contracts with the buyer and seller terms being directly written into lines of code. By creating programmable agreements between individuals, companies, and embassies, smart contracts could streamline complex workflows by ensuring adherence to predefined conditions and optimizing the visa application and approval processes.

While governments want to maintain control over who is immigrating to their country to work, even for inter-European exchanges, smart contracts can automate the review process to help governments make a much more informed decision. Governments can

leverage blockchain to verify educational documents, birth certificates, job duties, and employment details to save an officer time compared to the current visa application process.

Artificial intelligence is the second element of technology that will impact subjective decision-making in this process. It can be leveraged to help the office access information they need, such as the laws or rules relevant to the case.

While the positive aspects outweigh the negatives, there is a notable downside related to potential errors in the system and the potential to widen the gap between affluent and economically disadvantaged countries.

“As blockchain technology reshapes the landscape of travel documentation, it presents a double-edged sword. On the one hand, nations with the resources to harness these innovations stand to revolutionize travel experiences for their citizens, enhancing security, efficiency, and convenience. On the other hand, there is a pressing concern that countries with limited access to such technology may find themselves further marginalized in the global arena,” says Ostberg.

“This disparity risks widening the gap in global mobility and employment opportunities and underscores the need for international collaboration and support systems to ensure equitable access to these advancements, making global travel and employment opportunities more inclusive and accessible for all.”

Blockchain’s role extends beyond visa issuance with its potential to transform immigration processes at border crossings. Immigrants with a blockchain-based digital identity can expedite immigration formalities by providing their public key. This would significantly reduce wait times at border crossings as authorities access immutable and comprehensive travel data securely stored on the blockchain.

The ultimate vision is a single ledger system that unifies immigration workflows worldwide. This standardized approach to global travel document management, facilitated by blockchain, aims to enhance efficiency, cooperation, and security worldwide.

Step-by-Step Workflow: Streamlining Travel Documentation with Blockchain

Here is one example of how individuals, governments, and security agencies could streamline the travel documentation process by applying a blockchain-based solution, as visualized in the research paper, *Passport, VISA, and Immigration Management Using Blockchain*, published by the 2017 23rd Annual Conference on Advanced Computing and Communications.

The innovative workflow involves issuing a new passport, application for a US visa, and immigration processes. The goal is to enhance efficiency, security, and transparency in managing travel-related documents.

Workflow Steps:

- 1) **Passport Application:** An Indian citizen initiates the process by applying for a new passport with a passport issuing authority, which verifies documents to ensure the necessary information is authentic and meets the criteria.
- 2) **Blockchain Data Entry:** If the document verification is successful, the passport agency enters the approved passport details into a blockchain ledger. Smart contracts ensure that only relevant data is entered, and the process maintains transparency and security.
- 3) **US Visa Application:** The individual, equipped with the blockchain-stored passport information, applies for a visa. Instead of submitting physical documents, the applicant provides only their public key to the US Consulate, initiating a secure query process.
- 4) **Smart Contract Validation:** Smart contracts defined between the US Consulate and the passport authority guide the data access permissions. The US Consulate queries the blockchain to access necessary passport details and makes informed decisions on visa approval or rejection.

- 5) **Blockchain Record Update:** Upon visa approval, the decision is recorded in the blockchain, creating an immutable record of the granted visa, including details such as visa number, validity, and type.
- 6) **Immigration Process:** As individuals prepare for immigration, they provide their public key to the airport authorities. A third smart contract is invoked, allowing airport authorities to access relevant passport and visa details from the blockchain.
- 7) **Decisions Based on Blockchain Data:** Airport authorities can use blockchain data to efficiently verify the traveler's history, including countries visited and previous visa approvals. Informed entry, exit, and stay duration decisions are made without extensive manual verification.

The proposed blockchain-based workflow ensures a seamless and secure travel documentation process. The result?

- Individuals benefit from a paperless, privacy-preserving experience.
- Governments gain a unified and transparent source of travel information.
- Security agencies enhance their monitoring capabilities to identify potential risks.

What Lies Ahead

Blockchain technology is poised to positively transform the future of passports, visas, and immigration processes. As blockchain gains widespread attention, experts predict it will significantly impact how we handle travel documentation and immigration workflows.

Blockchain's built-in transparency and immutability promise enhanced data security, granting individuals greater control over their personal information while making travel easier, processes more efficient, and costs lower.

"Blockchain has the potential to significantly influence travel and immigration, making it a more secure, transparent, and efficient

process. Organizations are now in a unique position where integrating blockchain doesn't demand a complete overhaul of existing systems — it can be integrated into complementary workflows to enhance global mobility,” says Ray Rackham, Senior Vice President of Thought Leadership at Newland Chase.

“Blockchain's full implementation in passport and immigration management signals an era where technology doesn't just support but reshapes and defines how we handle international travel and border control. It's a significant turning point where technology and rules come together, completely changing how we think about and manage global movement and access.”

The prospect of creating a standardized, secure, and transparent system represents a fundamental shift in how nations manage their borders and individuals navigate international travel. Future-proof your organization and position it for growth beyond borders, starting today.

Connect with Newland Chase today and take the first step towards a seamless transition into the era of digital nomadism. Let us help you prepare, adapt, and excel in this new world of work.