

Believe in Tonga

# Verifiable Credentials for Labor Mobility

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# Economic Vitality of Migration Workers

- ✓ International labor migration is vital for the economy of Tonga and other Pacific Island Countries (PICs).
- ✓ Remittances from seasonal workers are a major contributor to national GDP.
- ✓ The current process for obtaining and verifying credentials is manual, paper-based, costly, and time-consuming.
- ✓ creates a significant barrier for many Tongans, especially those from poorer backgrounds.

**44%**

of Tonga GDP  
from remittances

**~26K**

Tongan nationals  
work abroad seasonally

**100%**

paper-based  
credential process

# The Challenge: Manual & Costly Processes



## Manual Effort

Processes are paper-based, requiring physical presence and manual entry for credential verification.



## High Costs

Visa fees and gathering documents (police checks, education) create high financial barriers for the poor.



## Time Intensive

Visa processing can take weeks or months, delaying employment opportunities in Australia and NZ.

# Project Strategic Objectives

- ✔ **Illustrate Framework:** Show how blockchain VC frameworks improve labor mobility.
- ✔ **Prototype Concept:** Experiment with credentials like education and police clearance.
- ✔ **Demonstrate Benefits:** Prove value to issuers, holders, and verifiers.
- ✔ **Outline Insights:** Provide considerations for future operationalization.



# Ecosystem Participants

## Issuer

Authorities like the Tonga  
Police and Educational  
Institutions who verify  
attributes and sign claims.





## Holder

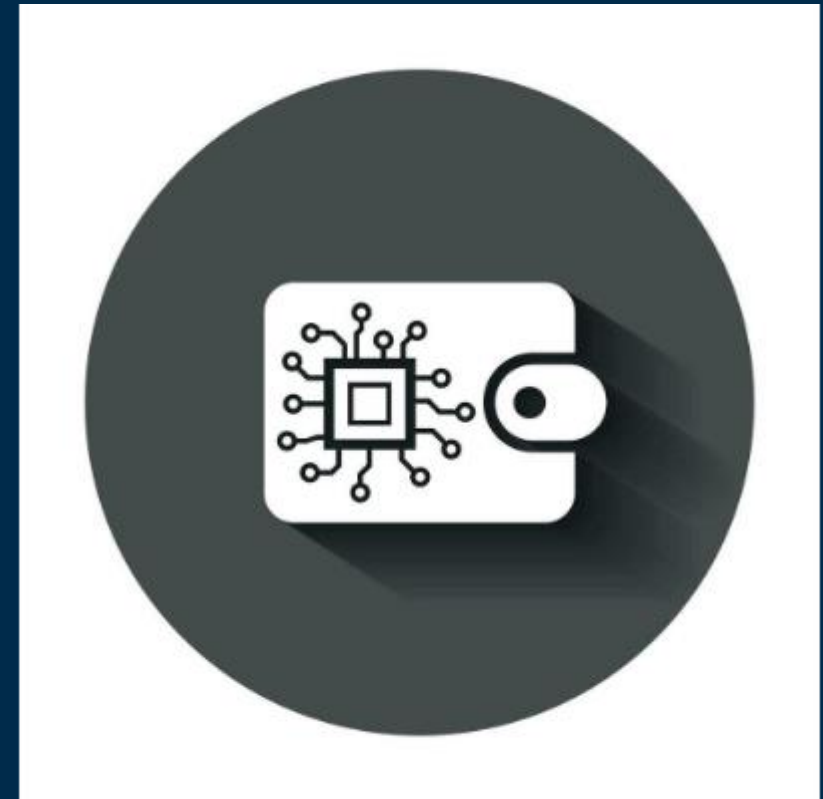
Tongan labor migrant worker  
who receives, stores, and  
presents digital credentials via a  
wallet.

## Verifier

Entities like Aus/NZ  
Immigration and employers who  
authenticate credentials without  
contacting issuers.

# The Verifiable Credential Solution

-  **Pairwise Connection:** Securely link Issuer and Holder.
-  **Credential Issuance:** Issuer provides signed claims.
-  **Private Wallet:** Holder maintains data until presentation.
-  **Verification:** Verifier resolves DIDs on the ledger to validate authenticity, possibly through zero-knowledge proofs.



# Prototype Scope: Key Credentials

Credential Type	Issuer	Key Attributes
Education Certificate	Skills/Educational Institutions	Course Title, Grade, Duration, Institution ID
Police Clearance	Tonga Ministry of Police	Record Summary, Location, Validity Date
Job Offer	Australian Employers	Job Title, Location, Duration, Employer DID

# Core Design Principles

## Functional Identity

Focused on task-specific credentials (education/police) rather than foundational ID.

## Mobile First

Designed for easy access by applicants via credential wallet apps on smartphones.

## Privacy by Design

Decoupling issuers and verifiers ensures no tracking of credential usage by authorities.

# Technical Prototyping Platforms



## Hyperledger Indy

A purpose-built DLT for decentralized identity, used for secure, pairwise data exchange.



## Kilt / Polkadot

Leveraging Parity Substrate for attestations and verified claim exchange on the Polkadot network.

# Information Stored On-Chain vs Off-Chain

## What goes on Chain

### Public DID

Written on the public ledger and is required foremost by the issuer of credentials so that the verifier can look up the ledger to verify claims asserted by the holder

### Schema Definition

A set of attribute data types and formats that can be used for the claims on a credential.

### Credential Definition

The instance of the schema and attribute specific public verification keys that are bound to the private signing keys of the individual issuer

### Hashes of verified claims & attestations

In case of one of the prototypes built using Parity Substrate Kilt Protocol

## What goes off Chain





### Private Pairwise DID

Every identity holder would establish a unique DID called pairwise DID for their related credential exchange activities, which is kept off ledger for privacy and to stop others from correlating

### Credential and Data Exchange

The credential exchange layer is where issuers issue credentials (describing subjects) to holders. Holders then act as provers to present proofs of those credentials to verifiers, who use the ledger to look up the issuer's DID to get the public key needed to verify the proof. Proofs, in turn, provide a means for the verifier to determine that the VC has not been altered.

# Operationalization Considerations

-  **Safety:** Prevent correlation by decoupling issuers from verifiers.
-  **Privacy:** Selective disclosure and data minimization (e.g. age check only).
-  **Wallet Risks:** Manage theft, loss, and the digital exclusion of those without devices.
-  **Governance:** Define trust frameworks for the blockchain and credential layers.

**Conclusion:** While DLT poses an effective option for authentication, institutional buy-in and feasibility assessments (literacy, regulatory) for adoption.

# Questions?

Believe in Tonga: Verifiable Credentials for Labor Mobility