



BHUTAN
NDI
A **dhi** Company

DECENTRALIZATION OF TRUST: BHUTAN'S DIGITAL IDENTITY PROJECT

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- **First Decentralised National ID: Bhutan National Digital Identity (NDI)** is the world's first nationwide decentralised system, launched on Oct. 13, 2023.
- **Legal Backing: [NDI Act of Bhutan 2023](#):** A dedicated law grants every citizen the fundamental right to privacy and control over their personal data.
- **NDI Wallet:** Citizens use a secure mobile NDI wallet (biometrically protected) to hold and share credentials.
- **Project Vision:** Bhutan NDI is a pillar of *National Digital Strategy* - to empower people with easy access to services, improve government efficiency, and boost the digital economy.

**BHUTAN NDI - A NATIONAL DIGITAL IDENTITY
REVOLUTION**





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What are VCs?

- **Verifiable Credentials (VCs) are tamper-evident digital certificates containing claims, digitally signed by an issuer.**
- **They can be cryptographically verified by anyone to confirm authenticity and integrity**



W3C Standard

- **Bhutan NDI adopts the W3C VC Data Model, a global web standard for credentials**
- **W3C VCs are tech-agnostic (JSON-LD/JSON format) and interoperable across platforms**



Why W3C for Bhutan NDI?

- **W3C VCs offer greater flexibility and decentralization**
- **W3C standards support the use of Decentralized Identifiers (DIDs) and web-based verification**

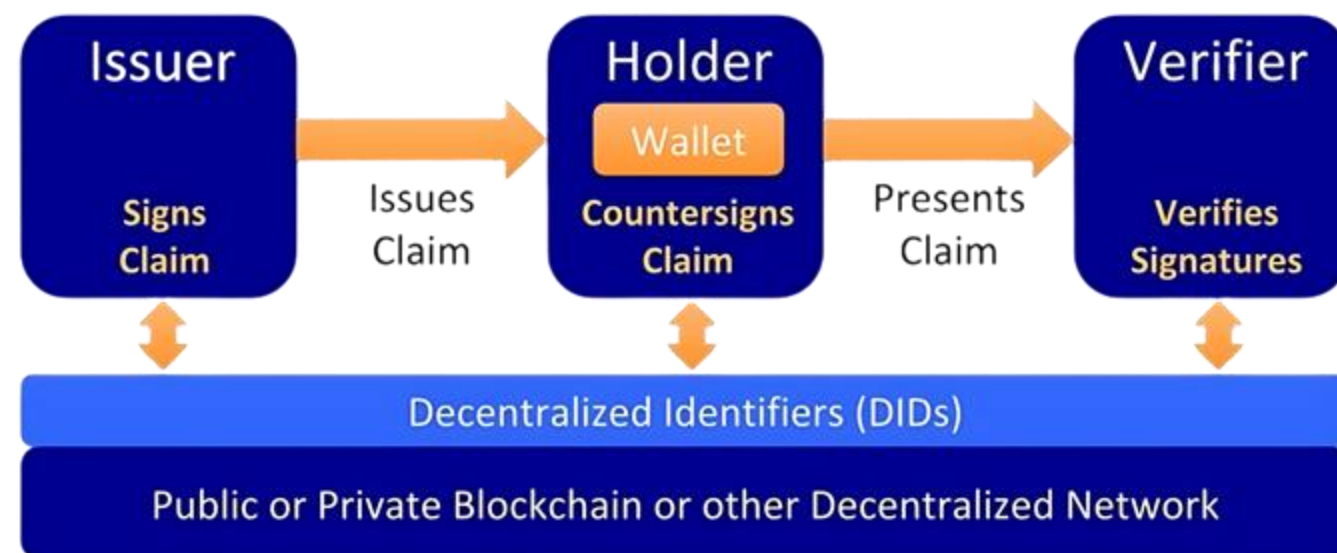


Interoperability & Portability

- **Using W3C's globally accepted specs makes Bhutan NDI issued credentials usable across different systems and countries.**

THE DIGITAL IDENTITY TRUST TRIANGLE

DIDs enable digitally signed **verifiable claims**



© Wikipedia

➤ Roles in SSI/Decentralised Approach

- Issuer, Holder, & Verifier

➤ Trust Flow

- In the “trust triangle”, the Verifier trusts the Issuer (not the intermediary)
- When a holder presents a VC, the Verifier *cryptographically verifies the Issuer’s signature*
- Trust is established through the credential itself - no need to query a central database in real time.

➤ Bhutan’s Trust Framework

- Issuers are vetted and registered in a Trust Registry
- Verifiers know which credential issuers are officially trusted
- This governance ensures that only legitimate authorities can issue certain credentials (e.g. only BCTA issues a driving license VC).

DECENTRALIZATION VS. CENTRALIZATION IN ID SYSTEMS

User-Centric Data Control

- In a decentralized model, *individuals control their identity data*
- Bhutan NDI stores personal credentials in the *citizen's own device*

01

Multiple Trust Anchors

- There is *no single point of failure* - Bhutan NDI leverages blockchain-based DIDs to avoid one central database being a weakness

02

Open Ecosystem vs. Silo

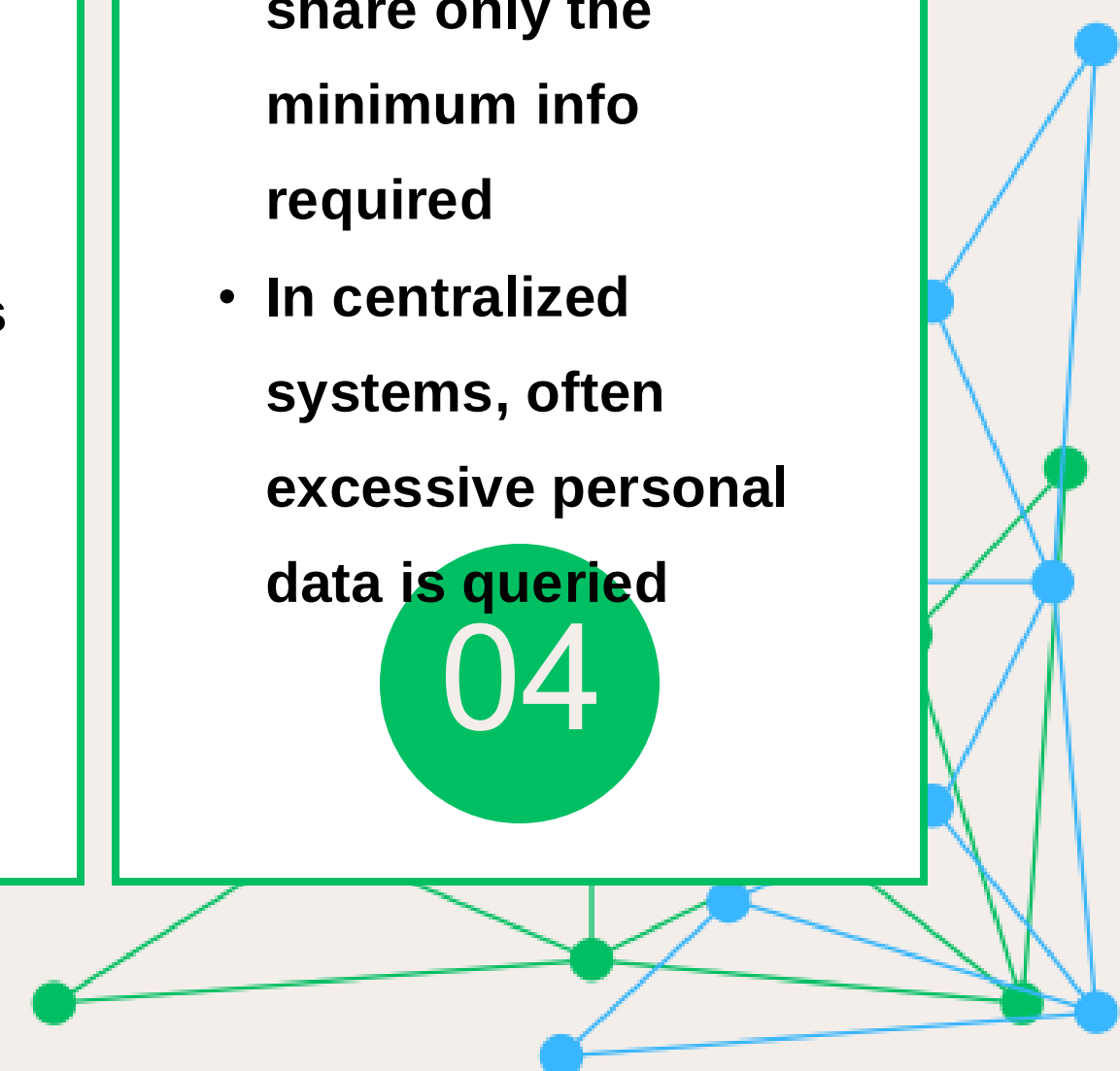
- In Bhutan NDI, *many organizations can issue and verify credentials within a common framework.*
- Banks, telcos, government agencies all participate as issuers and or verifiers in the NDI

03

Privacy & Consent

- Decentralization enables *selective disclosure* - users share only the minimum info required
- In centralized systems, often excessive personal data is queried

04



“TRUST IN USE” – HOW VERIFICATION WORKS IN PRACTICE

Offline Verification

- VCs can be verified offline
- Each VC is signed by the issuer’s private key; a verifier just needs the issuer’s public key (or DID document) to validate
- No live connection to the issuer is required if the verifier trusts the issuer’s public key.
- Bhutan NDI is developing printable QR code credentials (biometric cryptograms) for those without smartphones, so they can present verifiable proof offline

Real-Time Status Checks

- In digital systems, trust also means ensuring a credential is still valid
- Bhutan NDI includes a Revocation Service - issuers can mark credentials as suspended or revoked (e.g. if a driving license is suspended or an ID is reported lost)

Security & Authenticity

- When a holder shares a credential (often via scanning a QR code or secure exchange), the verifier agent automatically checks the digital signature.
- If tampered or not signed by a trusted issuer, it’s rejected

User Consent and Audit

- The service providers can maintain an audit trail of credential presentations (without revealing the data contents to any central party)



USE CASES IMPLEMENTED - GOVERNMENT SERVICES

Seamless G2C Access

- Passwordless logins to govt. portals
- Need not remember multiple passwords and usernames



Online Service Delivery

- Many services that once required in-person visits or paperwork are now online
- *Cuts down bureaucratic delays and travel need*



CITIZEN SERVICES



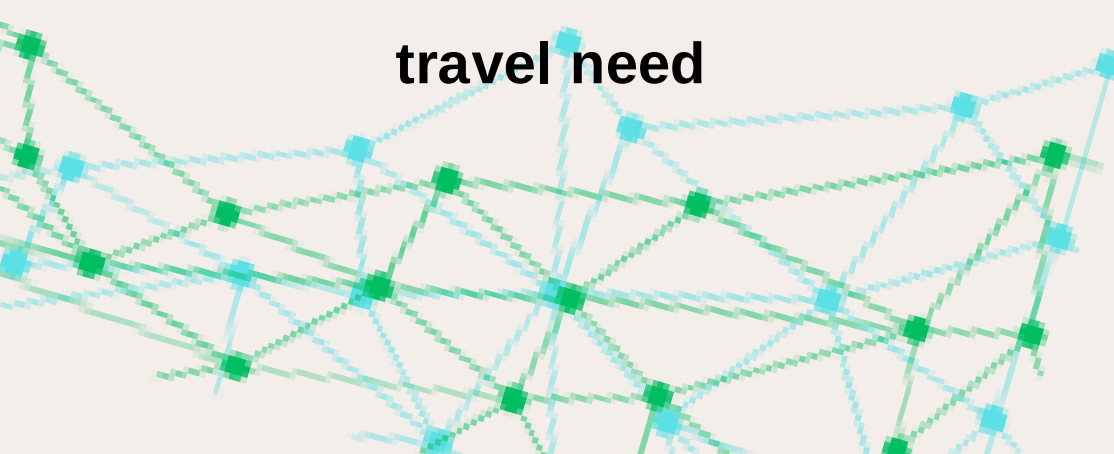
Example – Digital Documents

- When registering land or property, citizens can present their digital ID and Address credentials for instant verification



Inclusion and Outreach

- Bhutan is running awareness programs to onboard users to NDI
- Early feedback from citizens show appreciation for the convenience indicating growing trust in digital service delivery.



USE CASES IMPLEMENTED - FINANCIAL AND PRIVATE SECTOR



➤ eKYC

- Bhutan's banks are part of the NDI ecosystem
- Example: Bank of Bhutan accepts NDI credentials for e-KYC (Know Your Customer)

➤ Remote Bank Account Opening

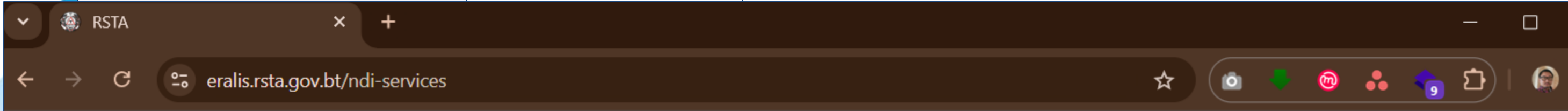
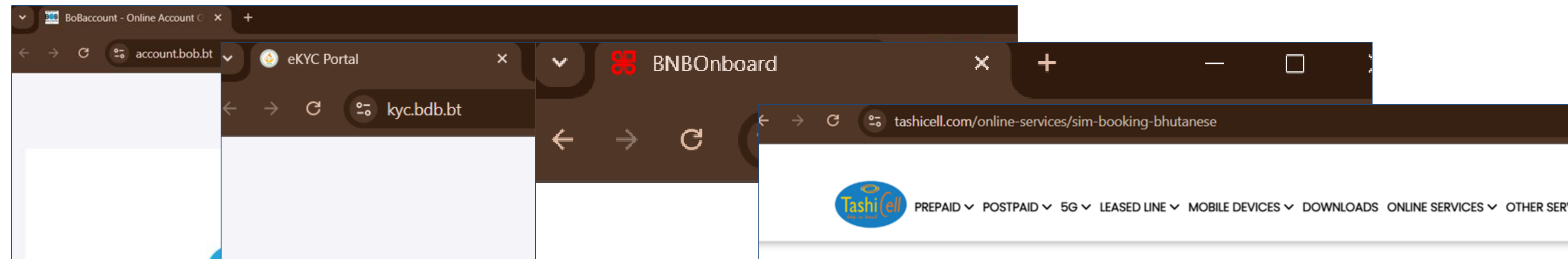
- Bhutan NDI allows direct savings account opening with BoB and Bhutan National Bank.

➤ Online SIM Booking

- Book SIM card directly using Bhutan

➤ ^{NDI}HR & Employment

- Apply for jobs at DHI Group using Bhutan NDI
- Manage civil servants' employee dashboard at Royal Civil Service Commission



Login | Register



- Home
- Services
- Pay Online
- Generate Receipt
- eTest Login
- National Digital Identity**

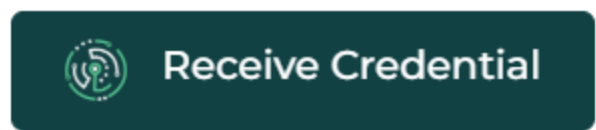
BHUTAN NATIONAL IDENTITY

Get verified vehicle ownership, driving license and learner license credentials in your Bhutan NDI wallet to access platforms, portals and services online.



Vehicle Ownership Credentials

Get verified vehicle ownership credential



Driving License Credentials

Get verified driving license credential



Learner License Credentials

Get verified learner license credential



NEXT STEP →

USE CASES IMPLEMENTED - DRIVING LICENSE GOES DIGITAL



Digital Driving License

- Bhutan Construction and Transport Authority (BCTA) issues driving licenses as VCs.
- A license credential is “issued and digitally signed by BCTA to confirm an individual’s permit to drive (light, heavy vehicle, two-wheeler, etc.)”
- *ToIP*
- Citizens no longer need to carry a physical license



Automatic Updates

- The digital license can reflect updates in near-real time
- If a license expires or is suspended, the status in the credential can be updated by BCTA (using the Bhutan NDI Revocation Service).



OUTLOOK - DECENTRALIZED TRUST EMPOWERING DIGITAL SOCIETY

Proven at National Scale

- Bhutan's experience shows that VCs and decentralized trust models can work at population scale

Building Trust = Driving Adoption

- A key lesson is that strong legal and governance frameworks underpinning the technology build public trust.
- Bhutan NDI Act and trust registry governance gave issuers and users confidence that the system is secure and accepted.

Interoperability and Future Uses

- By adhering to international standards (such as W3C), Bhutan keeps the door open for cross-border and cross-platform identity use.
- *For example*, Bhutan is exploring integration of NDI with India's DigiYatra system for seamless air travel identity verification

Total Successful Onboarding

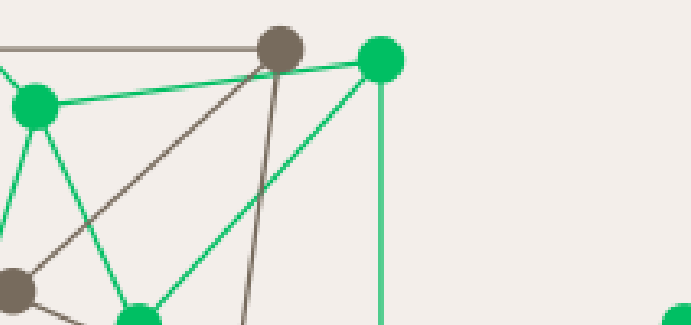
Last updated: May 18, 2025

310,900+

e-Services Integration

As of May 18, 2025

50+





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