From Citizen Dividends to Know Your Citizen: Enabling Innovation in Healthcare, Finance, and Shared Ownership

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Abstract

Building on the concept of Citizen Dividends, we propose a complementary framework: Know Your Citizen (KYCitizen). By leveraging distributed ledger technology, verifiable credentials, and privacy-preserving identity protocols, KYCitizen enables tailored public services, data-driven financial products, and novel shared-ownership models. We explore applications in healthcare personalization, decentralized finance, and community asset management, outlining technical architecture, policy considerations, and ethical safeguards.

Contents

1 Introduction

The Citizen Dividend concept has gained traction as a mechanism to share public-asset returns directly with residents. Originating with Alaska's Permanent Fund in 1976, the idea has since spread to academic and policy debates around Universal Basic Income (UBI) and data dividends. Yet, the success of these programs hinges on reliable identity infrastructure: without a secure way to verify citizenship and residency, distribution is prone to fraud, exclusion errors, and high administrative costs. In parallel, advances in distributed ledger technology (DLT) and self-sovereign identity (SSI) offer new tools to address these challenges. We propose *Know Your Citizen* (KYCitizen), an identity framework leveraging verifiable credentials and permissioned blockchains to underpin Citizen Dividends and enable downstream innovations in healthcare, finance, and shared-ownership models.

2 Background: Citizen Dividends and Identity

2.1 Citizen Dividends Recap

The Alaska Permanent Fund (APF) distributes 50% of annual oil royalty revenues to all Alaskan residents via a dividend check. Between 1982 and 2024, the APF paid out over $45billion, with per-capita payments ranging from $331 to $2,072 annually.[1] Empirical studies find that APF payments reduce poverty rates by up to 5% in Alaska and stabilize consumption during oil price shocks.[2] Parallel pilots—such as Finland's data dividend trial in 2021—have tested levies on digital platforms, redistributing revenues to citizens. While promising, these pilots encountered significant verification delays and data-privacy concerns, highlighting the need for robust identity solutions.

2.2 Identity Challenges in Public Services

Government identity systems in the U.S. are highly fragmented: Social Security Administration (SSA) records, state DMV databases, and Department of Homeland Security (DHS) documents each hold partial, siloed data. In 2023, an audit by the Government Accountability Office found that over 2million individuals received duplicate or erroneous benefits due to mismatched records across agencies.[2] Furthermore, centralized identity repositories present attractive targets for cyberattacks; in 2021, a breach of the SSA exposed personal data of 9million citizens. These issues underscore the necessity of a decentralized, privacy-preserving identity layer that can interoperate across public and private domains without creating new single points of failure.

3 Know Your Citizen Framework

3.1 Verifiable Credentials and Self-Sovereign Identity

The W3C Verifiable Credentials standard defines a data model for issuing, presenting, and verifying credentials in a cryptographically secure manner.[3] In KYCitizen, government agencies (e.g., SSA, DHS) issue signed credentials—such as `CitizenshipCredential` and `ResidencyCredential`—to user-controlled digital wallets. Users prove eligibility via zero-knowledge proofs (ZKPs) without

[1] Alaska Permanent Fund Corporation Annual Reports, 2024.

[2] U.S. Government Accountability Office, *Identity Management: Federal Agencies Need to Improve Interagency Data Sharing*, GAO-23-104, 2023.

revealing underlying PII. This self-sovereign approach ensures that no single authority holds all identity data.

3.2 Blockchain Infrastructure

KYCitizen operates on a permissioned blockchain (e.g., Hyperledger Fabric), where nodes run by federal, state, and selected private partners validate transactions. Smart contracts manage credential revocation lists and dividend distributions. Each citizen's wallet address is mapped to a DID (Decentralized Identifier) stored on-chain, enabling audit trails while preserving pseudonymity. On-chain governance modules allow stakeholders to upgrade protocols via on-chain voting.

3.3 Governance and Consent Management

A multi-stakeholder governance council—comprising government, civil society, and technical experts—sets policies for credential issuance, data sharing, and system upgrades. Citizens manage consent through a web/mobile dashboard, granting granular access to specific credentials for healthcare providers or financial institutions. Consent receipts are immutably logged on-chain, ensuring transparency and enabling revocation at any time.

4 Applications in Healthcare

4.1 Personalized Preventive Care

KYCitizen enables integration of demographic, social-determinant, and genetic credentials to tailor preventive care programs. For instance, citizens can opt-in to share anonymized health profiles, funded by dividend pools, to receive subsidized screenings for diabetes or cardiovascular disease. Smart contracts trigger voucher issuance when at-risk individuals meet eligibility criteria.

4.2 Clinical Trial Matching

Traditional trial recruitment suffers from underrepresentation and lengthy verification. KYCitizen's ZKP-enabled matching service allows researchers to query anonymized credential sets (e.g., age range, health condition) without accessing raw data. When a match occurs, the system notifies the citizen's wallet, and only with explicit consent is identifiable information released to the trial sponsor.

4.3 Medical Data Portability

Using DIDComm protocols, patients can securely transmit their complete medical history between providers. Each record—signed by its originating institution—is referenced on-chain, while the actual data resides off-chain in encrypted storage. This architecture reduces administrative friction and prevents data silos that delay care.

5 Innovations in Finance

5.1 Tailored Microloans and Insurance

Dividend payment history and identity credentials feed into decentralized credit scoring models. Lenders can underwrite microloans to underserved populations by assessing on-chain dividend receipt patterns and verified employment credentials. Similarly, parametric insurance products—such as crop-loss or weather-index policies—automatically pay out based on oracle-verified events, reducing claim disputes.

5.2 Decentralized Identity-Backed Tokens

Municipalities can issue tokenized community bonds collateralized by future dividend streams. Citizens purchase bonds using digital wallets; interest payments are distributed via smart contracts to holders' DIDs. This mechanism democratizes local infrastructure financing and aligns investor and citizen interests.

5.3 Regulatory Compliance and AML

KYCitizen supports privacy-preserving compliance: financial institutions verify that counterparties hold valid `CitizenshipCredential` and have no sanction-list flags, all via ZKPs. Transaction monitoring is performed off-chain against encrypted transaction hashes, and suspicious activity reports reference on-chain proofs without exposing full PII.

6 Shared Ownership Models

6.1 Community Land Trusts

Smart contracts enable fractional ownership of community land trusts. Each parcel is represented by an ERC-721 token; citizens holding tokens earn dividends from ground-lease revenues. Governance tokens allow collective decision-making on land use and development.

6.2 Cooperative Renewable Energy

Local solar and wind cooperatives issue ERC-20 tokens representing capacity shares. Dividends—derived from energy sales—are automatically distributed to token holders. KYCitizen ensures that only verified residents participate, preventing speculative external investment.

6.3 Public Infrastructure Crowdfunding

Cities can launch crowdfunding campaigns for projects (e.g., bike lanes, park renovations) via on-chain pledges. Only wallets with valid `ResidencyCredential` can vote on funding priorities, ensuring that local taxpayers steer investments.

7 Policy and Ethical Considerations

7.1 Data Privacy and Security

Compliance with GDPR and CCPA is achieved through minimal on-chain data storage and user-centric consent management. ZKPs prevent unnecessary data exposure. Regular security audits and bug-bounty programs maintain system integrity.

7.2 Inclusion and Equity

Digital divides risk excluding marginalized groups. KYCitizen pilots must include outreach—providing hardware kiosks, assisted enrollment, and alternative identity proofs (e.g., community attestation)—to ensure universal access.

7.3 Governance Models

On-chain DAOs govern protocol changes, but off-chain councils address legal and ethical dilemmas. A dual-layer governance model balances technical agility with democratic oversight, preventing capture by special interests.

8 Implementation Roadmap

8.1 Pilot Programs

Phase 1: Small-scale pilot in a mid-size city to test SSI enrollment and dividend distribution (n50,000). Phase 2: Expand to statewide trial, integrate healthcare voucher system. Phase 3: National rollout with interoperable state networks.

8.2 Technical Standards and Interoperability

Collaborate with W3C on DID and VC standards, ISO on digital identity, and NIST on blockchain security guidelines. Establish open APIs for third-party integration.

8.3 Scaling and Sustainability

Adopt Layer-2 rollups or sidechains to handle high transaction volumes. Implement dynamic gas subsidies funded by a portion of dividend pools. Continuous performance benchmarking ensures cost-effectiveness.

9 Conclusion

Know Your Citizen extends Citizen Dividends into a holistic identity ecosystem, unlocking innovations across healthcare, finance, and shared ownership while preserving privacy and democratic governance. By combining verifiable credentials, permissioned ledgers, and user-managed consent, KYCitizen offers a blueprint for the next generation of citizen-centric public services.

References

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[2] K. Johnson, *Universal Basic Income Experiments and Lessons*, Policy Insights, 2020.

[3] W3C, *Verifiable Credentials Data Model 1.0*, 2019. Available: `https://www.w3.org/TR/vc-data-model/`.

[4] U.S. Government Accountability Office, *Identity Management: Federal Agencies Need to Improve Interagency Data Sharing*, GAO-23-104, 2023.

[5] European Parliament, *General Data Protection Regulation (GDPR)*, 2016.