

ABSTRACT

Centralized credential verification relies on institution-controlled databases that lack cross-jurisdiction scalability, expose single points of failure, and are vulnerable to data tampering undermining fair, timely hiring processes. To address these issues, this study proposes a decentralized verification model that binds academic and professional credentials to user-controlled wallets as non-transferable Soulbound Tokens (SBTs), aligned with Ethereum draft EIP-4973. Requirements were informed by a focused literature review and semi-structured interviews with experts in academia, human resources, and technology practitioners. The model is formalized through a use-case diagram, actor-role workflow, and modular pseudocode that defines registry, minting, and time-based auto-revocation logic. Sensitive data is stored off-chain via IPFS, while verification logic executes entirely on-chain. Interoperability and privacy are supported through Verifiable Credentials for selective disclosure. Conceptual validation demonstrates how the model supports real-time credential querying and automated revocation without issuer reliance. The contribution is limited to model conceptual, prototype deployment and empirical performance testing are reserved for future research.

Keywords: blockchain, soulbound token, decentralized credential, verifiable credential, smart contract