



E-learning Course

Blockchain-based Microcredentials

5.2 Benefits and uses of Blockchain-based microcredentials



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Project No: 2024-1-SK01-KA220-ADU-000253202

Introduction

Module 5 will introduce the concept of Blockchain technology and how it relates to microcredentials. Materials will explain the basic components, roles and operations of blockchain networks, then move on to analysing the benefits of blockchain-based microcredentials. Learners will also be familiarised with the existing challenges in blockchain-microcredential integration.

This is the second Unit of the Module
5.2 Benefits and uses of Blockchain-based microcredentials



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Blockchain & Microcredentials

Integration Benefits



How is Blockchain used for Microcredentials?

Blockchain technology offers high levels of security and transparency. Its use has various benefits, such as tamper-proof storage and giving users complete control over their data.

Pairing blockchain with microcredentials allows the extension of all these benefits. It allows for quick and reliable verification and offers borderless credibility, increasing the strength of the earned credential.



Decentralisation & Data Control

Keeping microcredential data in a decentralised network gives learners control over their data and how it is used. No dependency on institutions and other intermediaries.



Security & Immutability

Once a microcredential is stored on the blockchain, it cannot be altered. This protects the microcredential from tampering and ensures employers/clients of microcredential validity.



Transparency & Fraud Protection

All actions related to the microcredential will be visible to any verifier on the blockchain, providing another level of guarantee for its authenticity.

How does it work?

While the details of the process can be different for each use-case, this is a typical pattern for the lifecycle of a blockchain-based microcredential :

Step 1

The learner earns a microcredential through the usual processes (f2f or digital course, seminar, etc.).

Step 2

The issuer of the microcredential (university, training institution, etc.) publishes the credential on the blockchain. Information such as completion, hours and topic of study, extent of validity and other crucial data is documented. The microcredential is connected to the learner's blockchain account.

Step 3

The learner provides the blockchain entry to potential employers, clients or other interested parties. They can access the blockchain to ensure the validity of all the information.

Blockchain & Microcredentials Integration Benefits



Blockchain & Microcredentials

Integration Benefits



Special Considerations

Prerequisites

The learner needs a blockchain account in order to take ownership of their microcredential.

The viewer also needs access to the blockchain in order to verify the information.

Security and Privacy

Because information can be publicly viewable in a blockchain network, special considerations to maintain privacy are needed. Cryptographic techniques such as hashes are often used to allow checking the validity of the information without actually writing it on the blockchain.

On-chain and off-chain interaction

Microcredential-related information exists outside of the blockchain network. In order to transfer such information to the blockchain, tools such as **Oracles** are used. An Oracle is a third-party, centralised service that monitors crucial information and is a trusted source for providing it to the blockchain.

Blockchain & Microcredentials

Use Case Examples



Credentify

Credentify is the first European issuer of blockchain-secured credentials, supported by universities and organisations across Europe.

They ensure microcredentials adhere to European qualification frameworks, and are integrated with ESCO.



Credentify

BCDiploma

BCDiploma is the first blockchain-based Open Badge for micro-credentials, used by over 250 institutions like universities, business schools and training organisations across the world.

They utilise blockchain technology to remove the need for third party dependencies in the credentialing process.



Blockchain & Microcredentials

Use Case Examples



University of Auckland

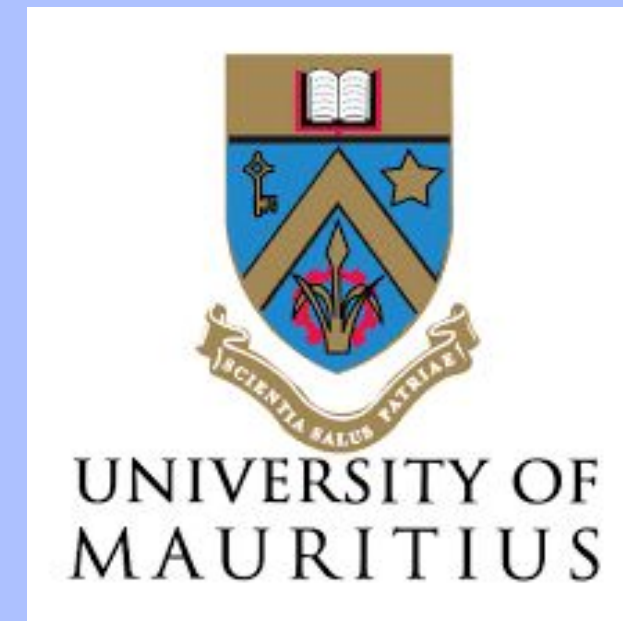
Researchers from the University designed and implemented a blockchain-based microcredential system to conduct research and verify that use of such systems decreases costs and workload for the institution.



University of Mauritius

The University provides microcredential publication on the blockchain, to allow its students easy storage, access and accessibility.

The University has made use of the Ethereum blockchain and IPFS for their system.



Additional Resources

Part	Title	Type	Duration	Link	Description
5.2	Empowering Micro-Credentials Using Blockchain and Artificial Intelligence Suggested Sections: Introduction, Blockchain and Micro-Credentials	Article	30 mins	https://www.researchgate.net/publication/378535843_Empowering_Micro-Credentials_Using_Blockchain_and_Artificial_Intelligence	An academic paper discussing the use of Blockchain and AI for microcredentials.
5.2	EBSI Success Story #6 - Micro-credentials	Video	2.5 mins	https://www.youtube.com/watch?v=5kMpfCVzINQ	A short video by the European Blockchain Services Infrastructure on Blockchain and Microcredentials.
5.2	Blockchain Oracle: Types, Uses and How it Works	Article	15 mins	https://www.geeksforgeeks.org/computer-networks/blockchain-oracle-types-uses-and-how-it-works/	An article explaining the use and functionality of blockchain Oracles.

References

Blockchain for Micro-Credentials https://microcredentials.eu/wp-content/uploads/sites/20/2019/10/Blockchain-for-Micro-Credentials.pdf
Blockchain-based Micro-credentials: Design, Implementation, Evaluation and Adoption https://scholarspace.manoa.hawaii.edu/server/api/core/bitstreams/f5200e13-ba30-43b1-b473-9dc41a03398f/content
Blockchain-based micro-credentialing system in higher education institutions: Systematic literature review https://www.sciencedirect.com/science/article/abs/pii/S095070512201334X
OERQI - University of Mauritius http://oerqi.uom.ac.mu/
BCDiploma https://www.bcdiploma.com/en
Credentify https://credentify.eu/



You have completed the theoretical part of Module X



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