



E-learning Course

Blockchain-based Microcredentials

5.3 Challenges in Blockchain-Microcredential Integration



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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 third Unit of the Module:
5.3 Challenges in Blockchain-microcredential information



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Blockchain & Microcredentials

Integration Challenges & Solutions

If Blockchain is so good, why is it not everywhere?

With the many clear benefits of using blockchain technology for microcredentials, it is expected to wonder: why aren't blockchain-based microcredentials more widespread?

Blockchain technology, and especially its integration with other sectors such as microcredentials, come with a unique set of challenges.

Because the technology is relatively new, and digital microcredentials are also an emerging concept, the challenges have not been entirely overcome, but solutions have started to emerge.



Blockchain technology is complicated and has a steep learning curve.



Implementation Complexity

There is a lack of starting level resources that explains on a practical and technical level how Blockchain technology can be integrated into different systems, including accreditation and issuing of microcredentials.



Concept Complexity

Lack of widespread understanding of its use and benefits lowers its usage rates. Learners have expressed through studies that they would be hesitant to use Blockchain-based Microcredentials, unsure if their potential employers/clients have a sufficient understanding of blockchain technology.

What to do?

Fortunately, user-friendly tools for microcredential-blockchain integration exist and keep improving, removing the need for hopeful users to have the technical understanding to set up a system. Still, support for educational institutions and organisations is needed.

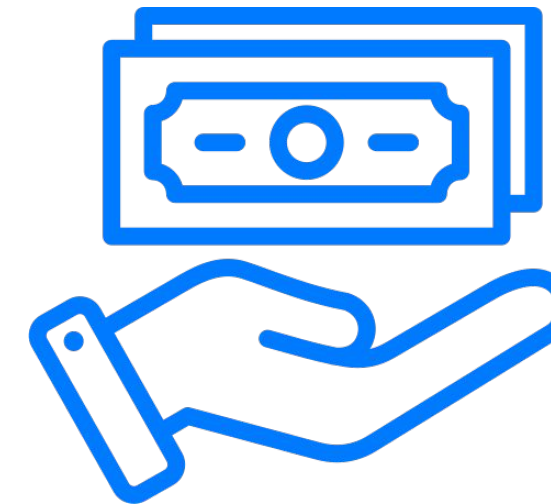
To increase public understanding of blockchain technology and therefore take full advantage of its benefits for microcredentials, there is a need for accessible, easy-to-absorb information that will allow stakeholders to recognise the value of blockchain-based microcredentials.



Financial Cost

Setting up a blockchain network can be costly in itself, and there is also the recurring cost of interacting with a blockchain network.

Due to operational costs of the network, users must pay “fees” to the nodes that create the blocks of the blockchain. This means that uploading a new microcredential will always carry a cost.



What to do?

Some blockchain network setups (such as Private Networks) can allow for operation with minimal or nonexistent fees. These networks are built to serve only a specific audience and purpose instead of being accessible to everyone globally.

Fortunately, other than the initial microcredential upload, blockchain is mostly used to view information related to microcredentials. Viewing blockchain data is always cheap, and often free.

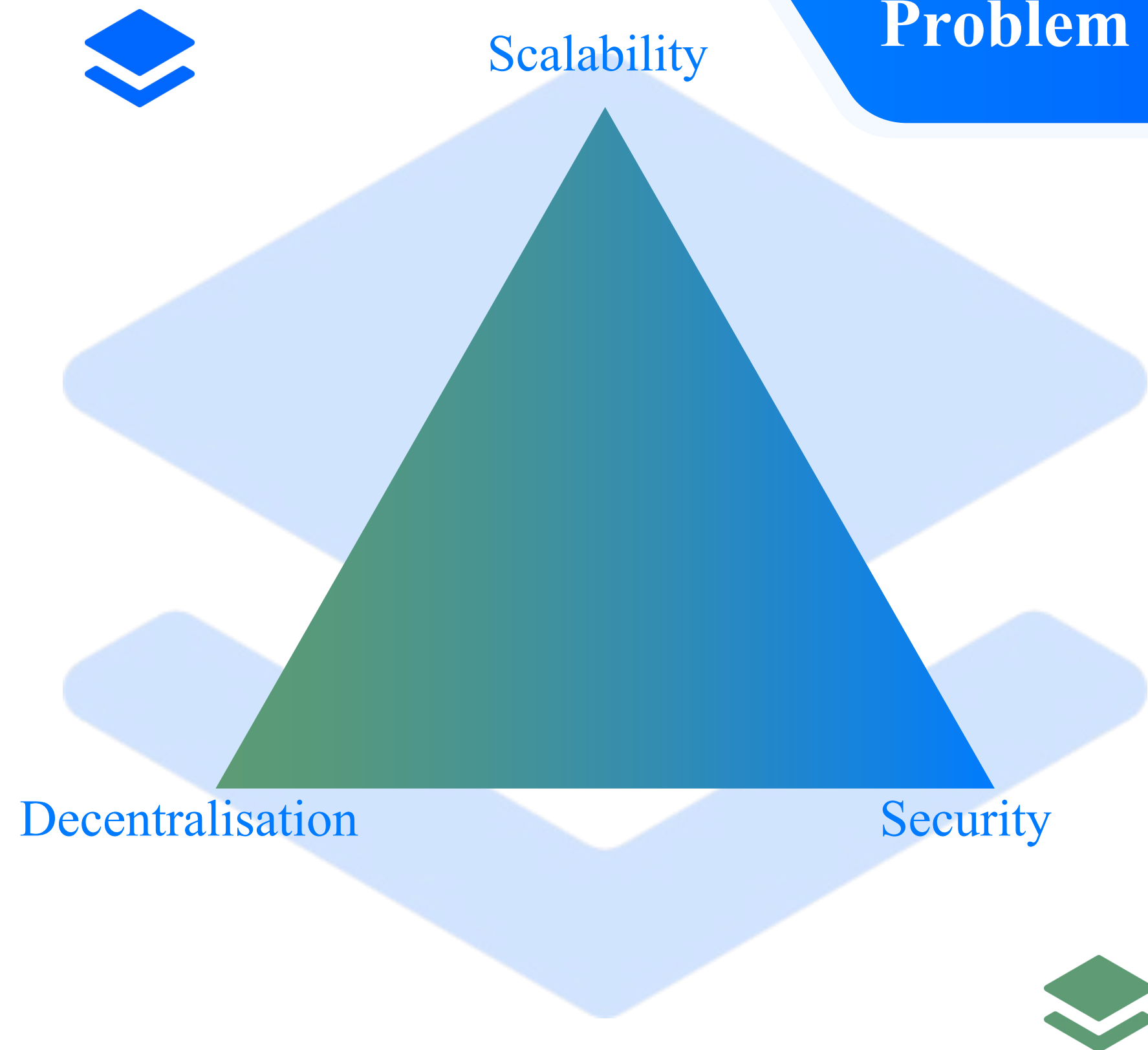


Blockchain technology is facing a Scalability Problem. It has become so popular, it is struggling to keep up with demand. This has caused time delays and cost increases in blockchain networks. This can discourage blockchain-microcredential integration.

What to do?

A lot of research has been dedicated to this issue and different solutions to the scalability problem have emerged. The problem is hard to solve due to the trade-off between Scalability, Security and Decentralisation. However, users now have the option to choose more scalable alternatives when using blockchain technology. Some examples include:

- Choosing Proof of Stake over Proof of Work networks.
- Choosing Private networks over Public Networks.
- Choosing options that integrate rollups, state channels, side chains, or other scalability mechanisms.





Low Human Error Tolerance

Human Error in Data Entry

Blockchain networks are designed to be immutable. That means, if there is a false entry due to human error, it is very difficult or even impossible to correct.

Loss of credentials

If learners lose access to their blockchain accounts, they will irrevocably lose ownership of their microcredentials.

What to do?

To prevent human error, it is essential to conduct thorough checks when entering information into the blockchain, or set up the blockchain network to allow changes under specific circumstances.

Learners should be made aware of the importance of not misplacing the credentials for their blockchain accounts, as they can be irretrievable.

Additional Resources

Part	Title	Type	Duration	Link	Description
5.3	Empowering Micro-Credentials Using Blockchain and Artificial Intelligence Suggested Sections: Challenges of Micro-Credentials Using Blockchain	Academic Publication	15 mins	https://www.researchgate.net/publication/378535843_Empowering_Micro-Credentials_Using_Blockchain_and_Artificial_Intelligence	An academic paper exploring the use of Blockchain and AI of microcredentials and associated challenges.
5.3	What is the blockchain trilemma?	Article	10 mins	https://www.coinbase.com/learn/crypto-glossary/what-is-the-blockchain-trilemma	A short article explaining the Blockchain Trilemma in simple terms.

References

Blockchain-based Micro-credentials: Design, Implementation, Evaluation and Adoption

<https://scholarspace.manoa.hawaii.edu/items/d72a8b0a-e74a-42da-a6a0-1a5172b4866b>

A perspective on post-pandemic biomass supply chains: Opportunities and challenges for the new norm

https://scholar.google.gr/scholar?hl=el&as_sdt=0%2C5&q=A+perspective+on+post-pandemic+biomass+supply+chains%3A+Opportunities+and+challenges+for+the+new+norm&btnG=

Blockchain state channels: A state of the art

https://scholar.google.gr/scholar?hl=el&as_sdt=0%2C5&q=state+channels+state+of+the+art&btnG=

Empowering Micro-Credentials Using Blockchain and Artificial Intelligence

https://www.researchgate.net/publication/378535843_Empowering_Micro-Credentials_Using_Blockchain_and_Artificial_Intelligence



You have completed the theoretical part of Unit 3 Module 5



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