

# A permissioned blockchain prototype facilitating banking record interoperability

University of Essex



Anrich Potgieter

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# Declaration

Test text

# **Abstract**

# **Acknowledgements**

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# **Chapter 1**

## **Introduction**

# Chapter 2

## Background Literature

### 2.1 Defining Blockchain Technology

#### 2.1.1 Background

Blockchain technology reaches back far further than the inception of Bitcoin, and we can see some of the first implementations appearing in 1998. In a 1998 white paper titled bmoney, we see some of the earliest building blocks of cryptocurrencies and the adoption of blockchain technologies (Dai 1998). Wei Dai outlines some cornerstone concepts that would later inspire Satoshi Nakamoto to create Bitcoin. Wei begins to outline a form of Zero Knowledge proof where two parties involved in an exchange or transaction use pseudonyms in the form of public keys to identify themselves within the context of a transaction (*Zero-Knowledge Proofs* — *Ethereum.Org* 2022). Furthermore, Wei begins laying the foundation of cryptographically complex puzzles that are solved to determine the value of the currency transferred. The concepts mentioned above would eventually lead to one of the crucial components of blockchains known as proof of work.

Further to the cryptographic puzzles introduced by Wei Dai in 2002, we see the emergence of a white paper by Adam Back titled hashcash (Back 2002). Back, originally envisioned these concepts to solve denial of service attacks on email servers where communication over these email protocols would come at a greater cost of computational power. Later Back realised that this denial of service concept would effectively translate into a proof-of-work function where this function would create a token representing the computational complexity required to solve the hash.

### **2.1.2 Types of Blockchains**

**Permissionless**

**Permissioned**

**Consortium**

### **2.1.3 Blockchain Components**

**Cryptographic Hash Functions**

**Transactions**

**Asymmetric-Key Cryptography**

**Addresses**

**Ledgers**

**Blocks**

**Chaining Blocks**

### **2.1.4 Consensus**

**Proof of Work (PoW)**

**Proof of Stake (PoS)**

**Delegated Proof of Stake (DPoS)**

**Proof of Elapsed Time (PoET)**

**Practical Byzantine Fault Tolerance (PBFT)**

### **2.1.5 Smart Contracts**

## **2.2 Organisational Interoperability**

## **2.3 Facilitating Interoperability using Blockchain Technology**

## **2.4 Blockchain Technology in Banking Organisations**



## **Chapter 3**

# **Ethical and Professional Considerations**

## **Chapter 4**

### **Evaluation**

# **Chapter 5**

## **Learning**

## **Chapter 6**

## **Conclusion**

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Back, Adam (2002). “Hashcash - A Denial of Service Counter-Measure”. In: p. 10.

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# **Appendix A**

## **Appendices**