Assignment I

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Subject: Blockchain Technology

Read and summarize the Bitcoin Whitepaper by Satoshi Nakamoto [1] and others like [2] and [3].

Satoshi Nakamoto introduced Bitcoin as a new kind of digital money that works without banks or central authorities [1]. The main problem Bitcoin solves is called double-spending where someone could try to use the same digital money more than once. Normally, banks prevent this but relying on banks has problems such as fees, delays and the risk that the bank itself could make mistakes or be hacked. Therefore, Bitcoin introduces a peer-to-peer payment system where trust is built into the technology itself.

At the core of Bitcoin is blockchain technology which is a digital ledger or record book that is shared across many computers. As described by Drescher [2], blockchain works by grouping verified transactions into blocks and linking them together in a chain. Each block is secured using cryptographic hashing and new blocks are added through a process called proof-of-work where network participants solve complex mathematical problems. This system makes it nearly impossible to change past records, ensuring data integrity, security, and transparency.

Blockchain technology allows people to send money or data directly to each other without needing a bank, government, or company to manage it. This makes things faster, cheaper and more open. It also reduces fraud and increases trust. Smart contracts, for example, are self-executing agreements that run on blockchain platforms, reducing the need for manual enforcement [2].

Weking et al. [3] explain that blockchain is changing business models by enabling peer-to-peer services, token-based systems, and decentralized apps. Companies use it to create new value, increase transparency and cut costs. Blockchain is changing how businesses operate by creating new, more efficient ways of working together and sharing information.

In short, Bitcoin and blockchain are important because they offer a new way to handle money and data safely, without relying on central systems.

References (IEEE Style)

[1] S. Nakamoto, Bitcoin: A Peer-to-Peer Electronic Cash System, 2008. [Online]. Available:

https://bitcoin.org/bitcoin.pdf

[2] D. Drescher, Blockchain Basics: A Non-Technical Introduction in 25 Steps. Berkeley, CA, USA: Apress, 2017.

[3] J. Weking, M. Mandalenakis, A. Hein, S. Hermes, M. Böhm, and H. Krcmar, "The impact of blockchain technology on business models – a taxonomy and archetypal patterns," Electron. Markets, vol. 29, pp. 1–17, 2019.