Connecting the Dots Through the Adoption of Blockchain Technologies in Library Services

Kayode Sunday John Dada

https://orcid.org/0000-0002-1322-7031

Ahmadu Bello University, Zaria, Nigeria

Hadiza Talatu Mohammed

Kaduna State University, Nigeria

INTRODUCTION

Libraries are cornerstones of information resources in various formats and types where information seekers and users visit to find and acquire information and resources on a variety of topics. With the advent of the internet, libraries have had to adapt to changes in how people access information and its resources. One way libraries have been able to do this is by digitizing their collections and making them available online and offline to the community it serves. Another way that libraries have been able to stay relevant is by offering services and equitable access that go beyond just checking out books and ensuring information is available for individuals but also provisioning of electronic information resources ranging from e-books, DVDs, and even literacy skills classes on a variety of topics for students, researchers and information seekers.

Libraries can provide services to people of all ages who are away from their residency on a permanent or temporary basis due to homelessness, statelessness, employment (business-related or seasonal work) or travel, and access to information as provided by libraries needs to move with these individuals. These communities who cannot obtain information resources and a library card and are ineligible to take materials out of the library. Hirsh and Alman (2023) proposed that with the introduction of blockchain Sovereign Identity (SSI) this problem can be resolved through the use of an interoperable blockchain-based system that crosses all types of library systems and a secure verified digital identity that can be used in participating libraries to gain access to information, digital content and print collections to all potential users in participating library systems while managing risk to ensure that the privacy and personal identity of each user is secure.

It is worth noting that libraries have not yet fully embraced use of blockchain technologies for its services. Blockchain is seen as a distributed database that allows for secure, transparent, and tamper-proof transactions. This technology has the potential to revolutionize the way that libraries operate by bringing automation and transparency to the process of checking out books and other resources (Suchitra, 2022).

BACKGROUND

Concept of Block Chain

According to libguides (2018) Blockchain is a shared, immutable ledger that facilitates the process of recording transactions and tracking assets in a business network. An asset can be tangible (a house, car, cash, land) or intangible (intellectual property, patents, copyrights, branding). Virtually anything of value can be tracked and traded on a blockchain network, reducing risk and cutting costs for all involved.

According to Hirsh & Alman (2023), blockchain is viewed as a list of records called "blocks" that are linked together using cryptography, and it's commonly referred to as a "distributed ledger technology." It is a a figure illustrating the principles of blockchainlong chain of data entries that are theoretically immutable because cryptography is used to secure data using the hash function. A reference is made each time a block is added to the chain creating a date/timestamp. The high level of transparency makes corruption difficult unless more than 51% of the computing (hashing) power is controlled by one or more groups working together within a blockchain network. There are no intermediaries which allows for self-sovereignty of data and collaboration between users.

Overview on The Emergence of Block Chain Technologies

Blockchain technology has been one of the biggest innovations of the 21st century given the ripple effect it is having on various sectors, from financial to manufacturing as well as education. Unknown to many, is that Blockchain history dates back to the early 1990's. Since its popularity started growing a few years back, a number of applications have cropped up and its uses in all sectors, education, commerce, banking with the race of adoption of 21st century digital economies (Goyal, 2018; Haferkorn & Quintana Daiz, 2015; Accenture, 2017).

How Block Chain Emerged?

Haber and Stornetta (1991), in their study envisioned what many people have come to know as blockchain, in 1991. Their first work involved working on a cryptographically secured chain of blocks whereby no one could tamper with timestamps of documents (Haber & Stornetta, 1991). In 1992, they upgraded their system to incorporate Merkle trees that enhanced efficiency thereby enabling the collection of more documents on a single block. However, it is in 2008 that Blockchain History starts to gain relevance, thanks to the work one person or group by the name Satoshi Nakamoto (Nakamoto, 2008).

The origin of blockchain could be traced to a nine (9) page whitepaper published in 2008 by Satoshi Nakamoto. In the paper Satoshi's outlined in details sophisticated mathematical formula and a resilient distributed architecture. He described bitcoin as platform that can be used to send payments between two willing entities without requiring a third-party financial body. His postulated that transaction of blockchain is stored in the blockchain ledger, which will be linked to the preceding ones using a digital signature, authenticated with algorithms and digital signatures and add transactions to the blockchain (Nakamoto, 2008).

Ever since Satoshi Nakamoto exited the scene and handed over Bitcoin development to other core developers, the digital ledger technology has evolved resulting in new applications that make up the blockchain History. A very common question, when was blockchain invented? we see can say Blockchain was invented in 1991 (Bayer, Haber & Stornetta, 1993; Christidis & Deretsikiotis, 2016).

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