**Chapter 4**

**APPLICATIONS**

The Merkle Tree finds its applications in various aspects of digital world and wherever cryptography technique is applied.

Some of its applications are listed as under:-

**4.1 Digital Currency**

Merkle trees (and variations) are used by Bit coin, Ethereum, Apache Cassandra, and other systems to provide:

* consistency verification
* data verification
* data synchronization

The concept of block chains, which leverages Merkle trees, is growing in popularity beyond bit coin. Businesses that need to track data and verify the integrity of the data are beginning to see how block chains assist in that process.

**4.2 Global Supply Chain**

For example, IBM and Laersk are teaming up to use block chains for managing the global supply chain:

"Technology giant IBM and Maersk, owner of the leading transport and logistics company Maersk Line, have announced a potentially groundbreaking collaboration to use block chain technology to digitize transactions among the world wide vast and interconnected network of shippers, freight forwarders, ocean carriers, ports and customs authorities participating in the supply chain.

If widely adopted, the technology could transform the global, cross-border supply chain and save the industry billions of dollars, according to IBM and Maersk."

**4.3 Health Care Industry**

Google along with AI-powered health tech subsidiary, DeepMind Health, is planning to use a new technology loosely based on bitcoin to let hospitals, the NHS and eventually even patients track what happens to personal data in real-time.

The plan is to create a special digital ledger that automatically records every interaction with patient data in a cryptographically verifiable manner. This means any changes to, or access of, the data would be visible.

**4.4 Capital Markets**

Despite the fact that the blockchain was initially developed as a freely-accessible, utility-like alternative to traditional means of recording and storing the transfer of assets between counterparties within a distributed, shared network, many fintech start-ups are focused on developing private blockchains in 2015 that can only be accessed by pre-approved participants. GreySpark believes this trend shows a disconnect between the business imperatives of fintech start-ups to create blockchain solutions that garner widespread uptake and the desire of banks and buyside firms to support a DLT [Distributed Ledger Technology] solution designed to service every aspect of the pre- and post-trade lifecycle.

**4.5 Git and Mercurial**

Apparently (though I could not find what I consider to be an authoritative source on the matter) both Git and Mercuriual use specialized Merkle trees for managing versions.