SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

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Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF COMPUTER SCIENCE AND TECHNOLOGY

COURSE NAME: 19CS622-Blockchain Technology

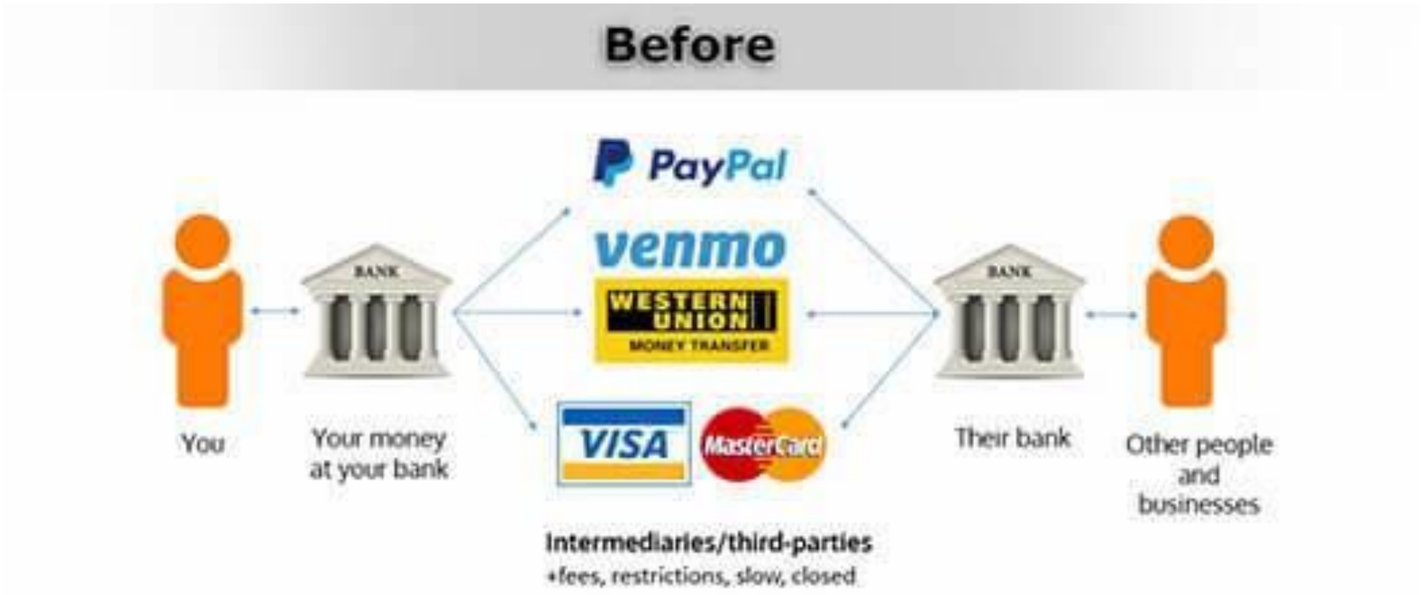
III YEAR /VI SEMESTER

Unit 2- CRYPTOCURRENCY

Topic 1 : BITCOIN

BITCOIN

- A distributed, decentralized digital currency system
- Released by Satoshi Nakamoto 2008
- Effectively a bank run by an ad hoc network
  - Digital checks
  - A distributed transaction log
- Number of BitCoins in circulation 11.8 million (December 2013)
- Total number of BitCoins generated cannot exceed 21 million
- Average price of a Bitcoin: around $300
  - Price has been unstable.
- Total balances held in BTC 1B$ compared with 1,200B$ circulating in USD.
- 30 Transactions per min. (Visa transaction 200,000 per minute.)


Before
PayPal
venmo
WESTERN UNION
MONEY TRANSFER
VISA
MasterCard
BANK
BANK
You
Your money at your bank
Their bank
Other people and businesses
Intermediaries/third-parties
+fees, restrictions, slow, closed

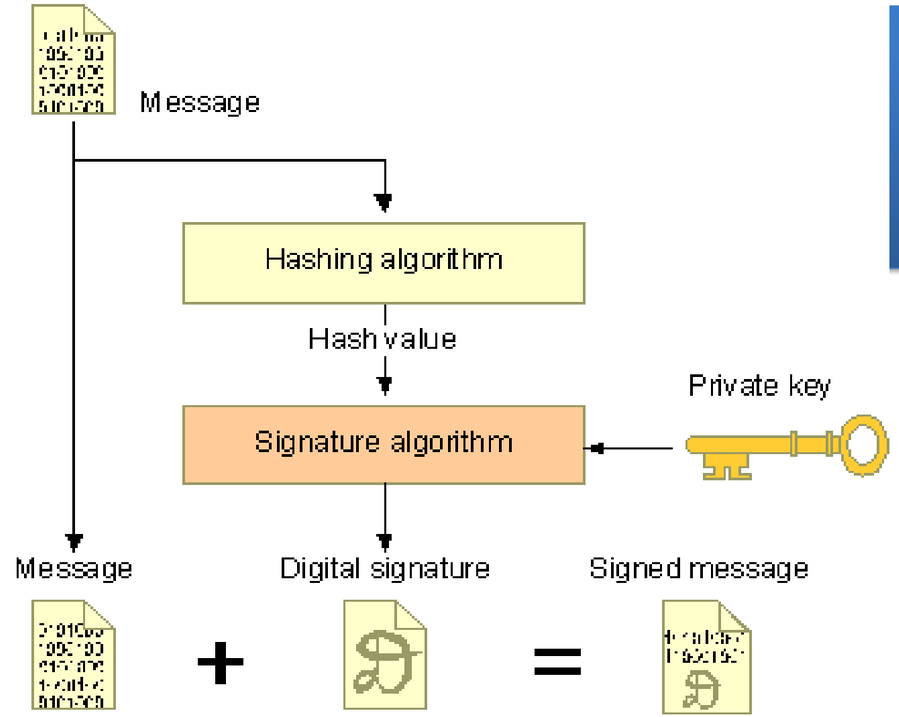

After, with Bitcoin
You
The Bitcoin network
Open, peer-to-peer, secure, instant
Other people and businesses

SECURITY IN BITCOIN

- **Authentication** → **Public Key Crypto: Digital Signatures**
  - Am I paying the right person? Not some other impersonator?
- **Integrity** → **Digital Signatures and Cryptographic Hash**
  - Is the coin double-spent?
  - Can an attacker reverse or change transactions?
- **Availability** → **Broadcast messages to the P2P network**
  - Can I make a transaction anytime I want?
- **Confidentiality** → **Pseudonymity**
  - Are my transactions private? Anonymous?

Public Key Crypto: Digital Signature

First, create a message digest using a cryptographic hash
Then, encrypt the message digest with your private key

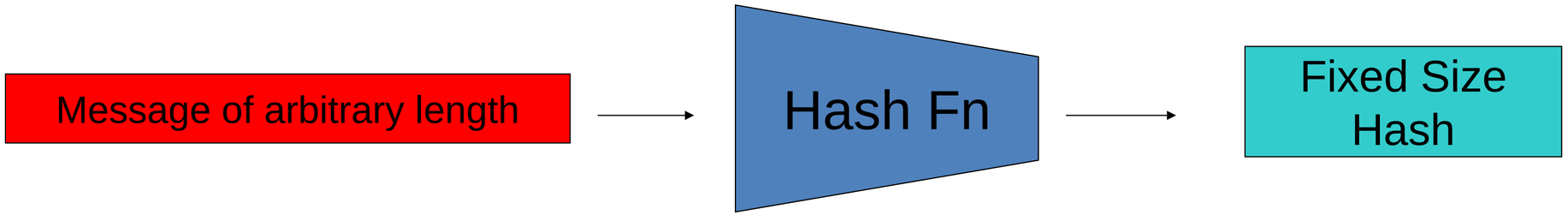


Authenticat
Integrity

Non-repudiation

Cryptographic Hash Functions

- Consistent: hash(X) always yields same result
- One-way: given Y, hard to find X s.t. hash(X) = Y
- Collision resistant: given hash(W) = Z, hard to find X such that hash(X) = Z



BITCOIN

Bitcoin is an digital currency introduced in 2008 by pseudonymous developer "Satoshi Nakamoto". That can be exchanged for goods and services

Digital: Bitcoins cannot be printed or physically made. They must be generated through computerized methods.

Decentralized: Bitcoins are not regulated by any government or banking institution.

Revolutionary: Transactions allow for anonymity and are almost instantaneous.

Global: Bitcoins are borderless currency and can be used anywhere.

Summary

References

TEXT BOOKS

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3. Arvind Narayanan, “Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction”, Princeton University Press, July 19, 2016.
4. Henning Diedrich, Ethereum: Block chains, Digital Assets, Smart Contracts, Decentralized Autonomous Organizations-2016

Thank You