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IBS-S01 - Blockchain & Cryptocurrency Primer Course

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IBS-S01 - Blockchain & Cryptocurrency Primer Course - Notes

1. Blockchain At First Sight

1.1 Background of Blockchain

- Emerging Technology
- Future Enabled Skills
    - Skillset
- Blockchain development is a skill
- Originally Block Chain, but now Blockchain
- Fintech (Many Technologies)
    - Blockchain (One of the few areas where Blockchain is used)
        - Cryptocurrency
- Cryptocurrencies are not completely blockchain (derived from bitcoin)
- Double Spending
    - Email
        - You can send multiple copies and copy and paste to send to more people
    - Sending currency
        - You can't double spend

1.1 What is a Blockchain

- Data Structure / Distributed Ledger Technology
    - Peer to Peer Layer
    - Internet Layer
    - Putting the ledger online
- Decentralized Distributed System
    - Centralized system is system right now
    - Banks
        - Central server got burned down
        - If it's burned then, no way to get cash
    - Decentralized is keeping the ledger on multiple people
        - All parties are known as nodes
    - Maintain the ledger they need to download an application
        - Connects to the network
        - Becomes a node
        - Everytime you login updates
        - Update to latest ledger
        - Same copy of the ledger
        - Example: Seven Nodes, but Six go offline, it will still work
        - Network is slow --> Less Nodes
        - 10000 to 11000 Nodes Bitcoin
        - 17000 Nodes Ethereum
        - If number of nodes going offline then it will be slower
        - Example: NEO, a few nodes go down it didn't work
    - Online and Transparent Ledger
        - Requires Internet

        - Transparent
            - Everyone can see in general
            - General case is transparent
    - Consensus
        - Security System
        - Having nodes agree on a common event
            - The creation of the block
        - Voting Rights
        - Voting System
        - Arbitration
        - Example: Three nodes agreeing, but one node not agreeing. No Consensus
        - Example: Four nodes agreeing, but one node agreeing. Consensus
        - For Bitcoin 51% of nodes must agree to work

1.2 Dissecting the Blockchain

- Genesis Block
    - Hardcoded
- Block Size
    - Limitation in amount of block size and number of transactions stored
- Competitive Nature of Blockchains
    - Confirmation Time
    - Block Size
- Sequential Date / Time Order
    - Latest Block is latest added
- Block height
    - The number of blocks
- Block Time
    - Time to create a block
    - 10 to 15 minutes in order to create a block
    - 15 secs for ethereum
- If someone wants to change the data at 100, then the chain will fail, due to cryptographic hash. 51% of hashing power must be possible too.
- Reward constantly reduces, in some models like bitcoin

1.3 What's In a Block?

- In order to chain, they must be linked by the cryptographic hash
    - Reference to previous block
- 10 transactions 1 cryptographic hash
- Merkle Root
    - Where Transactions are being stored

1.4 Achieving Consensus - Proof Type

- Proof of Work
    - Bitcoin and Ethereum right now
- Proof of Stake
    - Test Protocol of Ethereum
- Unconfirmed Transactions go to this unconfirmed transaction pool
    - Proof of Work is then applied
        - Miners then start mining (Mining Nodes)
            - Fees come from miners
            - Example: Fee is 0.1 btc, and another fee is 0.5 btc, then transaction with fee of 0.5 will be faster
            - Takes longer the lower the fee
            - Check if it's a Bitcoin Transaction
            - Validity of addresses

            - Rank the transactions
            - Prioritised Transaction goes into a block
            - First one to publish to the blockchain gets a block reward and transaction fee
        - Bitcoin takes 6 confirmations
        - 1 hour to approve a block
        - Fees don't affect, nodes and network speed affect
        - Max supply
            - 21 Million Supply would be mined, no more block rewards.
            - Transaction fee continues to get higher
            - All coins need to be mined.
            - Need to mine from 0 to 21 Million
            - Bitcoin Today: 17 Million Supply
- Proof of Stake
    - Another Consensus Module
    - List of PoS Coins: https://www.poslist.org
    - PoS uses less hardware / electricity to validate
    - No more mining nodes, no mining
    - Masternode / Supernode: Nodes with lots of coins
    - Process
        - A send to B
        - Sent to unconfirmed transaction pool
        - Validators are chosen at random
            - Those which hold higher amounts have a higher chance to be a validator
            - Smaller users put the tokens in their staking wallet
            - Join them to do a validation
            - Staking Wallet: To stake.
            - Everyone must run nodes in PoW
            - Large Banks can invest large amount of coins and earn lots of money
            - Smaller Players can earn transaction fees / dividends
            - Drastically reduces nodes needed
            - Less nodes with lots of money can stake
    - Premined Coins: Coins which are mined before distribution
        - Certain amount of money being distributed
    - Smart Contract: Supply has been generated

1.5 Types of Ledgers

- Centralized ledgers
    - Bank Book
    - Bank Accounts
    - Mint Records
    - Company Accounts
- Decentralized ledgers
    - Viewable in a block explorer
        - Bitcoin: blockchain.info
        - Ethereum: etherscan.io
        - Neo: neoscan.io
    - Block Explorer purposes
        - View Addresses
        - Charts
        - Transactions
        - Also additional features: Example, Ethereum Smart Contracts
    - Neo chart with all the latest transactions
- Transaction are stored on a ledger
- Block Explorer is the ledger to show the block chain
    - Visualization purposes
- Multiple Block Explorers to improve uptime

1.6 Types of Blockchain

- Public Blockchain
    - Permissionless
    - No ownership
    - Unknown Participants
    - Everyone can see all the transactions
    - No KYC
    - Risks
        - You don't know what is happening in the transaction
        - No IP linked to them
    - Example: Bitcoin, Ethereum, NEO
    - Bitcoin Foundation doesn't own Bitcoin Blockchain
- Private Blockchain
    - Permissioned
    - Has ownership
    - Known, trusted participants
    - Example: Ripple
    - Ripple Labs owns the Ripple Blockchain
        - Example: X, Y, Z banks can't access Bank W's Private Ledger
    - Platforms for creating private blockchains
        - Hyperledger Fabric
        - Multichain
            - Built on open source code of bitcoin

1.7 Blockchain Benefits

- Saves Time
    - Dubai: Full Blockchain government
    - Save 25.1 Million Man-Hours
- Removes Cost
- Reduces Risk
    - Immutable
- Decentralization
    - Trust in governments
    - Increases trust
    - Trust issue
    - Solves the inflation problem
    - Means to transact peer to peer without a third party
- Hacking the blockchain
    - Must spend billions of dollar to hit the 51% limit
    - No one would invest that much money to hack it
    - Live Blockchain
        - It's always happening
        - Not like an excel spreadsheet
        - Blockchain can't be edited
    - Confirmation Time
        - Can the 51% reflect the same ledger
        - Not economical to hack it
        - By the time you change it and when you go online, one is force to update to the latest block
        - 100 Blocks, then updated up to block 100, the hacker by the time they login, they are still at 90, so attack will fail. Hacked data will not go to the blockchain. Form the longest chain.

1.8 Blockchain Limitations

- Increasing Transaction Fee
    - Limitations as it may increase

        - Takes time for it to decrease
        - $18 USD fees were very high
- Network Difficulty
    - Increasing the fees
    - More difficulty to mine bitcoin
    - Increase fees, to incentivize miners
    - Few cents to 1 dollar, then that's the only incentive, then not much people will mine
    - The more the supply is being limited
    - The more the fee raises
    - Transaction fee function is very
- Hard to understand blockchain
    - Awareness and knowledge is needed
    - More than 51%, don't know about blockchain
    - Blockchain Developers need to communicate technology
    - Blockchain Developers need to communicate use cases
- Blockchain must have a good business network
    - Use case must be proper
    - Also require a large network
    - Example: Banks works because of the large network they have

1.9 The Evolution of Blockchain

- Blockchain 1.0
    - Ledger-Based Technology, Cryptocurrency
- Blockchain 2.0
    - Smart Contracts
- Blockchain 3.0
    - Cross-chain
    - Must have third parties for now, but for the future, no need for third parties
    - Blockchain to Blockchain is technical
    - Litecoin to Ethereum worked
    - Lightning Network
    - Example: Cosmos
- Blockchain 4.0
    - Improve Transactions per seconds
    - Bitcoin TPS: 7 transactions per second
    - Ethereum can do 15 to 20 transactions per second
    - Paypal and Visa can do thousands
    - Some blockchains can do millions
    - Competitive factor, that some blockchains aim to get
- Ethereum
    - Vitalik was part of the foundation before
    - Smart contract idea was rejected
    - Vitalik co-founded with someone the Ethereum platform

Hands-On Activity 1

- Finding seed words
- Simulation of Mining
- More complicated, that activity

2. Use Cases of Blockchain

2.1 Use Cases as Cryptocurrency

- Remittance
    - Example: Western Union

        - $20 to remit
        - Minimum to remit is $20
        - $40 to remit
        - 1 to 2 days to reach other party
        - Specific locations
    - Example: Cryptocurrency
        - $0.31 of ethereum
        - $0.031 low time
        - 28 secs to send
        - Can be sent anywhere
- Purchases
    - Example: Bitcoin for buying in restaurants
        - Bitcoin removes intermediary
        - Peer to Peer direct transfer
        - 10x more efficient
        - Price can go up and down though
    - Example: Credit Card
        - Intermediary
        - Needs to go through the bank
        - Bank charges 3%
    - Exchanges
        - Crypto exchanges to allow buying and selling of cryptocurrency.

2.2 As Smart Contract

- Nick Szabo proposed the idea of a smart contract
- "Code is Law", whatever is written should stay as is, not changeable
- Smart contract is different from paper contract
- Legal side, can be incorporated into smart contract
- When smart contract is deployed there's no way to change it
    - Immutable
- The DAO
    - Smart contract like an organization
    - Ethereum Hack
        - Bug in the code allowed them to fish the funds out of the DAO
        - $50 Billion USD of Ethereum being hacked.
        - Fork
            - Creating a new blockchain out of existing one
        - Ethereum Classic
            - Old Blockchain
        - Error of Code
        - Old group doesn't believe in Ethereum Classic
        - Community wanted to rewind
    - Coded in Solidity
    - Process
        - Programmed in Solidity
        - Audit the Code
            - Choice, not a must, but recommended
            - Queueing the smart contract
            - Some blockchains are not live
            - No bugs
            - No endless loops
        - Compilation
            - Compiled into bytecode
            - Compiled into auxcode
        - Deploy Contract
        - Verify and Publish Contract
        - If there's a bug then just rewrite the code

        - Etherparty, code smart contract in a visual way. Drag and drop.
    - You can view the code of the smart contract
        - Github
        - Etherscan.io
    - Arbitration
        - Between Community
- DApps
    - Decentralized Applications
    - Decentralized Exchange

2.3 Blockchain as a Service (BaaS)

- Amazon Web Services
    - Blockchain Templates
- Microsoft Azure
    - Blockchain on Microsoft Platform
- IBM Blockchain
    - IBM Blockchain Garage
    - Help business to design blockchain at low costs
- Corda
    - Focused on financial blockchains

2.4 Blockchain Platforms

- Ethereum
    - Most favoured network which will be used in the future
- Waves
- Bitshares
- NEO
- QTUM
- Omni
    - Tether uses Omni
- CounterParty
- NEM
- Stellar

2.5 Other Use Cases

- There are legal applications
- No legality ICOs yet
- Food wastage on the blockchain
- Halal Coin
    - Food wastage
- Well
    - Store Patient Data
    - Blood type and other data
    - Well App
    - Advice yourself on your wellbeing
    - Based on trusting the doctor
    - KYC on the Doctor
        - Credentials and other information
    - Can be used to give medical advice to people who don’t have much doctors in their area.
- PolicyPal Network
    - Insurance
- Singapore Airlines
    - Krisflyer points on blockchain
    - Other purposes
    - Also AirAsia and Cathay Pacific

- BlockCerts
    - MIT Certs can allow verification on the blockchain
    - Blockchain to verify certification, so only transaction fees
    - Even quizzes may be on blockchain
- MegaX
    - Retail on blockchain
        - POS details and such
- Voting on Blockchain
    - Cannot be cheated
- ICON
    - Custom Clearance using blockchain
    - Leverage blockchain
- First Electronic Certificate on Blockchain
- Blockchain can revolutionize shipping industry
    - No foul play
    - Immutable
- Diamond Mining
    - Allows tracking diamond mining
    - Who found diamonds and other information
    - Even certificate of blockchain
- Everledger
- Blockchain for verifying rights on content
    - Images
    - Digital Assets
    - General Assets
    - Legal Industry and blockchain
    - Big use case
    - Factom
        - Protect IP Real Estate Perspective
        - Validate
        - Immutable
        - Estonia doing stuff with this
- Legality has loads of use cases
- Get lots of non players to contribute to blockchain
- Driving Permits
    - Forgot international driving permit
    - Allows people who forget driving license, that allows people who forgot the driving permit to be verified.
- Use case list
    - https://docs.google.com/document/d/15WXCxfK7uIn4OpozADCvuV9MklXiS1uNZ0vMlTsyvWU/edit
    - Games
        - CryptoKitties, buy kitties
        - Crypto Countries, buy countries
        - Crypto Celebrities, buy celebrities
        - Bounty.io, Enjin Coin, rewarding for playing games
    - Music
        - Fake vs. Real Music
    - Property
        - Buying property on the blockchain
        - Tracked on Blockchain
        - Who should be entitled to property could be on the blockchain.
    - Voting
        - Agora Voting

Group Discussion 1

- Law will eventually need to be enforced

Presentation BCOIN

- Token Sale

3. Cryptocurrency Fundamentals

3.1 What is Cryptocurrency

- Cryptography + Currency
- Subset of centralized digital currency
- Decentralized Digital Currency
    - You own it
    - It's safe

3.2 Common Use Terms of Cryptocurrency

- Altcoin / Alternative Cryptocurrencies
    - Cryptocurrencies, which are not Bitcoin
- BTC
    - Bitcoin short form
- ETH
    - Ethereum short form
- Cryptocurrency
    - A decentralized digital currency
- ERC20
    - Ethereum Tokens, following the ERC20 protocol. How a token should be run.
    - Other token protocols such as ERC227 and other which improve ERC20
- FOMO
    - "Fear of Missing Out" fearing of losing profits
- FUD
    - Spreading fake news
- HODL / HODLING
    - "Holding on for Dear Life"
- ICO / ITO (Initial Currency Offering / Initial Token Offering)
    - Initial Currency Offering
- KYC
    - Know your Customer
- Moon
    - Go up a lot
- Sats
    - Satoshis lowest denomination
- Sh*tcoin
    - Coin with no potential / no market cap
- Whale
    - Someone with a lot of cryptocurrency

3.3 Current Timeline

3.4 Why Cryptocurrency?

- Belief in the cryptocurrency
    - Value adding to society
- Low barriers to entry
- Fallibility of the currency system
    - Inflation
- Ease of Use

    - Easy to send
- Economic Uncertainty
    - Runs by itself, not affected by economy

3.5 Types of Wallets

- Brain Wallet
    - Remember 12 seed words
- Software Wallets
    - Download client to use wallets
    - Example: Neon, Jaxx
- Web Wallets
    - Access coins online
    - Can be phished and also hacked
- Cold Wallets
    - Offline Wallets
    - Paper Wallet
        - Put QR Code and address to get them to be paid
        - Also store the private key
        - Ethercard
    - USB Drive
- Hardware Wallets
    - Example: Ledger, Trezor

3.6 Address Specifications

- System-assigned
    - Example: MyEtherWallet
- User-generated
    - Example: Keep generating public keys again. User-generation platform
- Can be embedded into a QR Code
- Makes payment faster
- Invalid Address
    - If it isn't in the same format, then it will stop you from sending

3.7 Types of Address

- Wallet Address
    - Unique to each cryptocurrency
- Contract Address
    - Address associate with a deployed smart contract
- Exchange Address
    - Address associated with a particular coin / token in an exchange
- ERC20 Address
    - Addresses part of the Ethereum Blockchain
- Bitcoin to Bitcoin can work
- Only cryptocurrency addresses of one type of token

3.8 Name Service

- https://www.myetherwallet.com/#ens
- You can bid for eth addresses
- Name service for addresses

3.9 Types of Exchanges

- Centralized
    - Exchange owned coins

        - Not anonymous
        - Faster Transaction Speed
        - Lower cost of transaction fee
        - If hacked then tokens are gone
- Decentralized
    - User owned coins
    - Anonymous
    - Lower transaction speed
    - Higher cost of transaction fee
- DEX = Decentralized Exchange
- Supporters of centralized and decentralized exchanges

3.10 Cryptocurrency Exchange

- F2C (Fiat to Crypto Exchange)
    - Bcoin
    - Coinhako (Not really an exchange)
    - Gemini
        - Opening office in Singapore soon
    - Quoinex
        - Japan licensed exchange
        - Reputable
    - FYB-SG
        - Bitcoin only
    - Cashing Out
- C2C (Crypto to Crypto Exchange)
    - Binance
    - OKEX
    - Huobi
    - Bitfinex
    - NEX (NEO exchange)
    - Ommer (Singapore Exchange)
- Decentralized Exchange

3.11 Alternative Source For Cryptocurrency

- OTC (Over the-counter)
    - Between trusted shops
    - Hassle of travelling
    - Minimal or NO KYC
    - Instant Transaction
- Bitcoin ATM
    - Limited Machines
    - High fees
    - Limited Supply
        - Sometimes, they might not have the bitcoin to provide for you
    - User Friendly
    - Future
        - Buy and Sell Cryptocurrency
- Local Community / P2P
    - Between strangers / friends
    - Super high mark-up
    - No KYC
    - Fast, but not instant

Hands-On Activity 2

4. Cryptocurrency Security

4.1 Basic Cryptography

- Symmetric Encryption
    - Secret Key for Both
- Asymmetric Encryption
    - Public Key: Encryption
    - Private Key: Decryption
- Hash Function
    - Hash Function converts plaintext to ciphertext

4.2 Cryptography of Systems

- Normal System
    - Pin Number
    - Bank Account Number
    - Bank Vault
- Blockchain Systems
    - Private Key (Fixed to Wallet)
    - Public Key (Blockchain Address)
    - Blockchain Ledger
- Analogy
    - Pin Number: Private Key
    - Bank Account Number: Public Key
    - Bank Vault: Blockchain Ledger

4.3 Safekeeping Your Crypto

- Long Term Storage
    - Cold Storage
        - Stores privates key
        - Always reset previously owned ledgers
        - Always do firmware updates
- Short Term Storage
    - Exchange Storage
        - Stored on the exchange

4.4 Securing Your Crypto

- Secured Web Browsing
    - Brave
        - Block third parties from accessing your data
    - Chrome
    - Firefox
- Secure Mobile Browsing
    - Cipher
        - Built in wallet in the mobile browser
        - Everything is encrypted
    - Brave for Mobile
    - Google Chrome for Mobile
    - Don’t use Emulators
        - Nox
        - Bluestacks

        - People can phish
    - Clear Clipboard History

4.5 Web Mining - Cryptojacking

- Computer mine on your computer, when you visit them. In order to help them earn coins

5. Valuation of Cryptocurrency

5.1 Overview of Crypto Market Valuation

- $800 Billion at its peak
- Top 100 cryptocurrencies, at a high percentage
- 1651 cryptocurrencies that have been recorded, with 1033 active cryptocurrencies as of May 2018
- Focus on Top 100
- 2 Billion was in 2017
- 6 Billion so far in 2018 as of May 2018

5.2 Deriving Cryptocurrency Value

- Valuation
    - Electricity costs
    - Item / service price
- Why does this have value?
    - Payment, can pay in order to buy something
    - Store of Value, must be able to hold value
    - Supply and Demand Model, when exchanges are launched

5.3 Cryptocurrency Grading

- WeissRatings
    - https://weisscryptocurrencyratings.com/
    - Criteria
        - Triple A
        - Similar to credit system

5.4 Crypto Wealth

- People who entered early

6. Cryptocurrency Investing & Trading

6.1 Investing or Trading

- Long Term Value
    - Fundamental Analysis
    - Buy and Hold
    - Hands-off
    - One-off transaction
    - Not affected by market crashes
- Short Term Value
    - Technical Analysis
        - Shows when to not enter
        - Not really at good times to enter
    - Day/Scalp, Swing Trading
    - Monitoring
    - Multiple Transaction Fees

        - Buy and sell activity
    - Very dependent on the market and corrections / crashes affect traders

6.2 Crypto Tools

- Market Analysis
    - https://cryptocompare.com
    - https://coinmarketcap.com
    - https://tradingview.com
- Portfolio Tracker
    - Blockfolio
        - If you lose your phone then you have to add coins back
    - Cryptocompare
        - Also add back portfolio to other devices and it's backed up

6.3 Investment Approach

- How much percent is premined?
- Distribution
    - How many percent go to the founders
- Tokenomics
    - Check the Total Supply
    - Kin
        - 10,000,000,000,000 units at $0.000222
    - DigixDAO
        - 2000000 units at $242+
    - TenX
        - Market Cap: 128000000 at $1.17
    - The total supply is important to consider
- Maximalist Approach
    - Only invest in one coin or the main source of the coins
- Ethereum can be the main pairing
- Fundamental Analysis
    - Checking if coins have a sound business model
- Dividend Model
    - Neo
    - Waves
    - Qtum
    - KuCoin
- VeChain is going to go big
- Ontology
- OmiseGo
- Binance could go FIAT
- KuCoin and Qtum have high dividend rates

6.4 Trading Approach

- Technical Analysis (Not 100%)
    - Volume
        - Top 30 stocks in stock trading, to find highly liquid stocks
            - Same concept with crypto (Top 100)
    - RSI
        - Above 80 RSI is overbought (price will go down)
        - Below 20 RSI is undersold (price will go up)
    - MACD
    - Bollinger Bands
        - Seeing upper and lower limits
    - ADX

        - Trend Movement
- Signal Groups, Bots, Speculation
    - Pay to get signals
- Stop-loss
    - Binance has stop - loss
    - Market crashes, but no stop loss, then now $100 investment becomes nothing
    - Stop - Loss to secure profits and minimize losses
- Dollar Cost Averaging (DCA)
    - Buying in at multiple price points
- Arbitrage Trading
    - Lowest price all across exchanges and then find the highest sell price and the profit of the margin.

Group Discussion 2

- Coin vs. Token
    - Coin
        - They run on their own
        - Examples: Bitcoin, Ethereum
    - Token
        - Cryptocurrencies built on another blockchain
        - Examples: ERC20, Tether

7. Initial Coin Offering (ICO)

7.1 Overview of ICO

- Initial Coin Offering sometimes meant to be Initial Token Offering

7.2 About ICO

- Crowdfunding
- Requirements
    - White Paper
        - Key to prospective investors
- Process
    - Private / Pre-Sale
    - Crowd / Public Sale
    - ICO Launch
    - There are also non ICO tokens
    - Soft Cap - Minimum an ICO can raise, if failed then sends back
    - Hard Cap - Maximum an ICO can raise
- Team Identity
    - If they don’t chose to reveal identity, then it could be a scam

7.3 ICO Advisory

7.4 What is a Good ICO/Cryptocurrency?

- Use Case
- Strong / Verified Team
    - Publicly known
    - Famous
    - Experience
- Security
    - KYC
    - Encryption
    - Data Protection

- Partnerships
    - Tron and OBike
- Criteria
    - 3Cs
        - Community
            - Good community backing it
        - Creativity
            - Existing business models
        - Compassion
            - Solves a social issue
    - 5Ds
        - Digitization
            - Needs to be digitized
        - Disintermediation
            - Get rid of intermediaries
        - Democratization
            - Giving power back to the community. Let's community opinion matter
        - Decentralization
            - Away from centralization
        - Diminishing
            - Move away once it becomes big enough
    - Lasic
        - Low Margin
            - Doesn't require too much money
        - Asset-Light
            - Little need for assets to work
        - Scalable
            - Business Model can it be scaled
        - Innovative
            - Out of the box
        - Compliant
            - Legally conforms to the rules of the country

7.5 Deep dive into ICO

Case Study 1: Pump and Dump

- Change Bank
- Pre-sale price $0.60 USD, but moved to $0.20 USD

8. Cryptocurrency Monetization

8.1 Mining Introduction

- Mining rewards get halved in bitcoin every few years
- Difficulty as more people mine
- More hashing power more rewards
- Technicalities changed
    - CPU --> GPU --> FPGA --> ASIC

8.2 Mining Advisory

- Profitability
    - Heat Reduction
    - Electricity
    - Hardware
    - Mining Hosting Costs

- Solo vs Pool Mining
    - Work to reward ratio
    - More chances at block reward / more reward
- Beware Scams
    - Cloud Mining contracts
    - Companies may run away
- Redundancy
    - Hardware becomes useless when coins switch from PoW to PoS.

8.3 Bounties/Airdrops/Faucets

- Airdrops
    - Giveaways
- Bounties
    - Giveaways for certain acts
- Faucets
    - Earn some crypto for doing certain actions

8.4: Earning Crypto/Token

- Storj.io
    - Rent out hard disk space
- Steemit
    - Write articles
- Ride for Tokens
    - Ofo in Singapore

9. Blockchain Ecosystem & Community

9.1 Blockchain Alliances & Consortiums

- Alliances
    - Ethereum Alliance
        - Multiple countries
    - Hyperledger
    - GBBC
- Consortiums
    - Ethereum Foundations
    - Neo
    - Blockstream
    - Ledgeris
    - Blockchain Zoo

9.2 Blockchain Advisory & Developers

- BFC in June
- Block Show November 2018
- DApps in Singapore
    - https://www.smarthongbao.com
    - Red packets on the blockchain
- DBS Blockchain Hack
- OCBC uses blockchain for payment

9.3 Merchants

- Tioman Ferry
- Artistry
- Ducats

- Institute of Blockchain
- Hospoda

9.4 Government, Regulators and Promoters

- MAS
- Singapore Dollars on the blockchain
- Project UBIN
- Access SFA
- Ethereum
- Attores
- Ngee Ann Polytechnic
    - First example of certifcate for blockhain
- SuSS (Singapore University of Social Sciences)
- https://sussblockchain.com

9.5 Media & Online Forum

- CoinDesk, CoinTelegraph, CCN, BitcoinTalk

9.6 SG Based ICOs & Start-ups

9.7 ICO Advisory & Community Management

9.8 Financial Institutions

9.9 Conferences and Forums

9.10 Participating in the Community

- Github
- Reddit
- Slack
- Meetup
- Telegram
- Nanyang Blockchain Association
- Crypto Uni

10. The Future of Blockchain & Cryptocurrency

10.1 Regulatory Stance on Blockchain & Cryptocurrency

- Singapore is Neutral
- Regulation is happening in Singapore
- Dubai Blockchain Government by 2020
- Petro in Venezuela

10.2 Blockchain Challenges

- Side chain
- Cross Chain
- Onchain - Offchain
- Zilliqa
    - Offchain concept
- Raiden Network
- Forking (More disagreements with com

- Governance / Regulation
- ISO / TC 307
    - General rules when it comes to blockchain
- Matrix
    - Blockchain Killer
- Hashgraph
    - Blockchain Killer
- Scalability

10.3 Notable Upcoming Blockchain/Crypto

10.4 Blockchain Revolution

- Fourth Industrial Revolution
- It’s an emerging tech option
- Blockchain is ahead of quantum computing
- More real world implementation
- Going mainstream very soon