HETACHAIN

HETA TECHNOLOGY CORPORATION
Authorisation Code : 146554230970
Cayman Islands.

INVESTOR

Relam Investment L.L.C
Main License No. 802466
United Arab Emirates

ريـلام للاســتثمار
RELAM INVESTMENT

HETACHAIN WHITEPAPER

HETACHAIN

The biggest blockchain 3.0 network

TABLE OF CONTENT

ABSTRACT

Blockchain 1.0
Bitcoin & Cryptocurrencies

Blockchain was invented by Satoshi Nakamoto in 2008 to serve as the public transaction ledger of the cryptocurrency bitcoin.[1] The invention of the blockchain for bitcoin made it the first digital currency to solve the double-spending problem without the need of a trusted authority or central server. The bitcoin design has inspired other applications etc.

Blockchain 2.0
Smart Contracts & Dapps

A smart contract is a computer protocol intended to digitally facilitate, verify, or enforce the negotiation or performance of a contract. Smart contracts allow the performance of credible transactions without third parties. These transactions are trackable and irreversible. Smart contracts were first proposed by Nick Szabo, who coined the term, in 1994.

Proponents of smart contracts claim that many kinds of contractual clauses may be made partially or fully self-executing, self-enforcing, or both. The aim of smart contracts is to provide security that is superior to traditional contract law and to reduce other transaction costs associated with contracting. Various cryptocurrencies have implemented types of smart contracts.

One of the most prominent in this field is the Ethereum Blockchain, which is an open-source, public, blockchain-based distributed computing platform and operating system featuring smart contract (scripting) functionality. It supports a modified version of Nakamoto consensus via transaction-based state transitions.

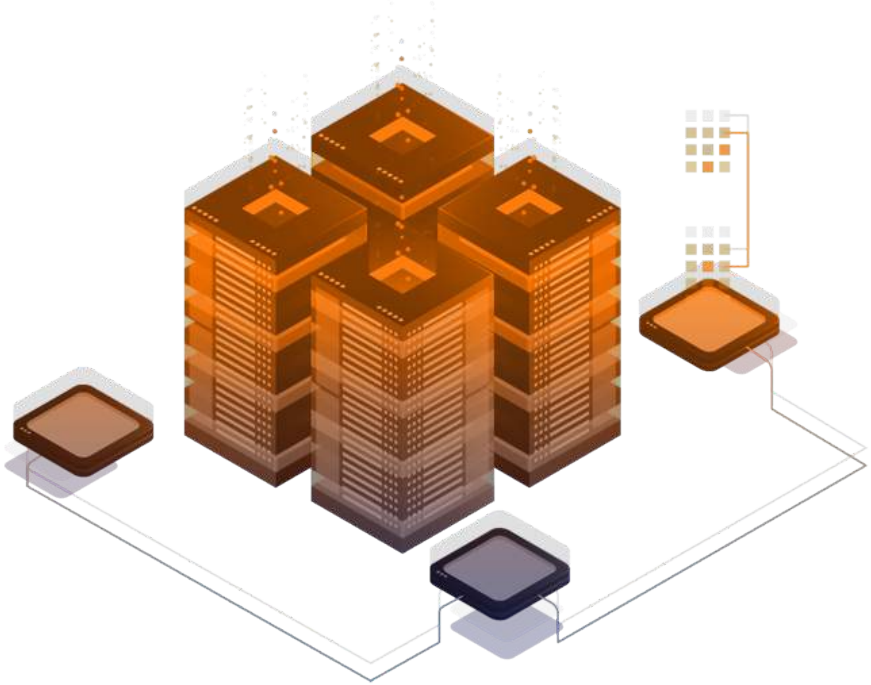
Ethereum blockchain applications are usually referred to as DApps (decentralized application), since they are based on the decentralized Ethereum Virtual Machine, and its smart contracts.

A decentralized application (Dapp, dApp or DApp) is an application that is run by many users on a decentralized network with trustless protocols. They are designed to avoid any single point of failure. They typically have tokens to reward users for providing computing power.

Blockchain 3.0
Hetachain & Multichain Platform

The world of our economy has changed since the day of Blockchain's and Bitcoin's invention. Also, the world of Hi-tech industry has changed since then. Afterward, smart contract platform opened the new era of the applications on top of Blockchain 2.0, which is a computer protocol intended to digitally facilitate, verify or enforce the negotiation or performance of a contract. Blockchain 2.0 allows the performance of credible transactions without third parties. Nevertheless, they called that protocols "trustless". Since then, the online business industry has been identifying...

Now, this year of 2018, HetaChain comes out and revolutionizes the new generation of Blockchain 3.0... Heta Blockchain 3.0 Platform helps governmental services, businesses, organizations... build the dApps and make the dApps into the real life: Banking Industry, IoT Industry, Robotics Industry, Healthcare Industry, E-commerce Industry ...



Source: Wikipedia

References:

1. Bitcoin whitepaper
https://bitcoin.org/bitcoin.pdf

2. Ethereum whitepaper
https://github.com/ethereum/wiki/wiki/-White-Paper

1. Introduction

This whitepaper proposes a new, high-performance and scalable blockchain platform as well as the ecosystem which makes blockchain more usable and valuable.

As introduced, “Blockchain” is the foundational technology behind Bitcoin. It is also a potentially groundbreaking innovation in how data is created, shared, and edited. Through an immutable ledger and consensus algorithms that ensure the integrity of the blockchain, it is possible to create a “trustless” type of information; a type that is truly decentralized and transparent.

But blockchain technology is still quite limited by these critical problems: stable, transactions per second (TPS).

1. 1 The problems of Blockchain Technology

Transaction performance
Transaction volume and applications are increasing rapidly on current blockchains, making network congestion a major issue
Bitcoin, a legacy network, is confined to about 7 TPS. Compared to Visa with an average TPS of 2,000 and a maximum TPS of 50,000, it is extremely slow
Even Lightning network aims for just 1,000 TPS, far below existing industry standards
Poor Security
Community splits can lead to multiple hard forks, leading to an increasingly splintered blockchain network
20% of network attacks
Difficulty in Developing DAPPs
Developers have issues creating optimized Dapps for existing blockchain networks

2. Design concept

Based on current problem, we propose HetaChain architecture, positioned as an easy-to-use, flexible for user, developer (easy to make smart contract), high-performance blockchain platform.

The system will be a mixture of on-chain DB and off-chain DB to utilize the storage power of offchain DB and minimize transaction weight.

The following Diagram is the Overview Architecture of HetaChain

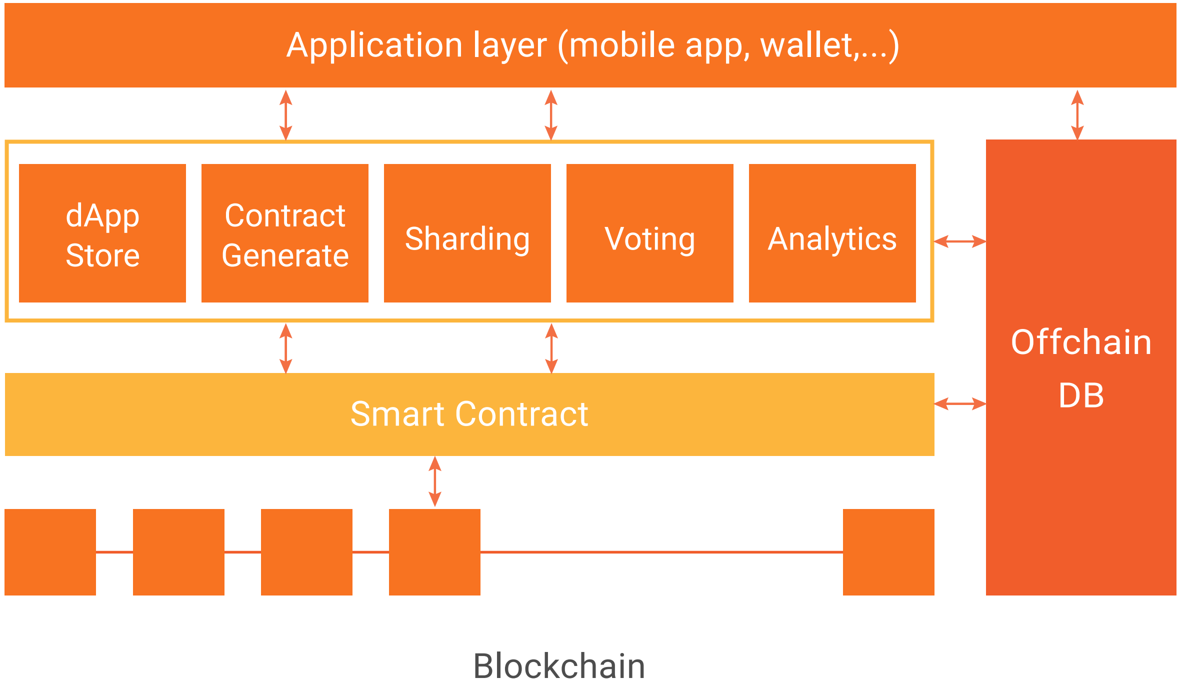


Figure 1 - Overall Architecture

We also provide pre-built support Applications: Dapp-store: pre-built app, users can select and get their Dapp running in Heta Blockchain.

Contract Generate: for people who don’t have knowledge about developing blockchain, they can build their own app just by dragging and dropping.

Voting: voting function for Master nodes vote.

Analytics: AI module for data analytics.

Sharding : TBD

3. Consensus

The heart of blockchain is the consensus algorithm, It's the most important factor that affects to the performance, throughput and scalability of any blockchain.

We will focus on analyzing the advantages and disadvantages of current blockchain consensus algorithms and then proposing a new platform that tackles the blockchain limitations.

There are four main methods of finding consensus in a blockchain: the practical Byzantine fault-tolerant algorithm (PBFT), the proof-of-work algorithm(PoW), the proof-of-stake algorithm (PoS), and the delegated proof-of-stake algorithm (DPoS).

Features	dPoS-BFT	dPoS	BFT
Block time	1 second	1 second	3 second
Transaction/seconds	~ Millions/s	~ Millions/s	
Block finality	1 second	1- 45 seconds	3 seconds
Network bandwidth	Medium	Low	High

3.1. Proof of Work (PoW)

Example: Bitcoin, Ethereum

How it works: uses a "hash function" to create conditions under which a single participant is permitted to announce their conclusions about the submitted information, and those conclusions can then be independently verified by all other system participants. The process of searching for valid 'hashes' (solutions to the 'hash function' created by the message input), is known as 'mining'

Pros: First consensus algorithm, totally decentralized

Cons: Consume a lot of energy, low throughput

3. 2. Proof of Stake (PoS)

Example: Nxt, Peercoin (PPC). In May 2017, ETH is in the process of completely switching from a PoW to a POS system.

How it works: extremely similar to the PoW system. PoS replace the hash function calculation with a digital signature which proves ownership of the 1st stake. The network selects an individual to approve new messages based on their proportional stake in the network. In the Peercoin system, the chosen party is rewarded with a new Peercoin in a process called 'mining'

Pros: High throughput

Cons: Nothing-at-Stake problem. By rewarding those who are already are most deeply involved in the network inherently creates an increasingly centralized system.

3. 3. Delegated Proof of Stake (dPoS)

Example: Bitshares

How it works: dPoS works along same lines as the POS system, except that individuals choose an overarching entity to represent their portion of stake in the system.

Pros: High throughput

Cons: It takes time to finalize and correct the chain if one of the master node fails in generating block.

3. 4. Byzantine Fault Tolerance (BFT)

Example: Hyperledger, Stellar, Ripple.

How it works: when a peer receives a message, this peer uses the message in conjunction with its internal state to run a computation or operation. This computation in turn tells that peer what to think about the message in question and what should this peer do. After reaching its individual decision, that peer shares that decision with all the other peer in the system. A consensus decision is determined based on the total decisions submitted by all peer.

Pros: High throughput, requires less effort than other methods, chain finalizes every block

Cons: Heavy work and network

3.5 Heta Consensus

Comparing those consensus algorithms are like Apple and Orange comparison. Each consensus algorithm has its strength and weakness and is used in different purpose. In term of scalability, block time and throughput, The dPoS and BFT seems the best algorithms. But, there are limits.

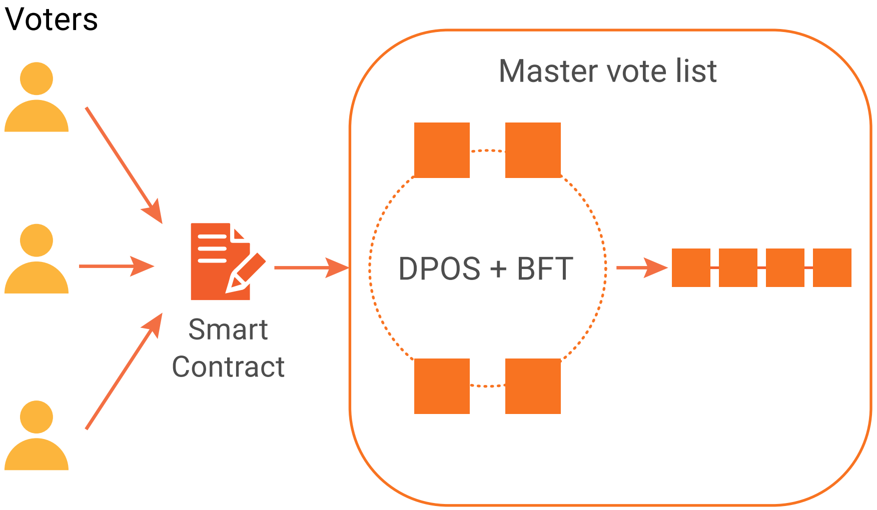
We propose a new blockchain based on dPoS and BFT hybrid consensus algorithm. In additional, we add the double verification process to make sure that block is stable once added to the chain.

- Every 0.5 seconds a new block to be produced and exactly one producer is authorized to produce a block.
- Master node is a node that holds a certain amount of coin and is received enough votes from stakeholder (anyone holding the coin). Stakeholder can vote or unvote master node anytime. There are 33 master nodes in the system. They are responsible for validating transactions and producing blocks.
- Under consensus algorithm, every stakeholder can vote or unvote for master node through a continuous approval voting system
- After voting round, master node has the right to produce block in its time slot.
- The random master node is chosen from the list on masternodes to verify the block producing by a masternode. The reason of choosing master node randomly, not based on any parameter is that, when choosing randomly, following probability theory, the probability of a specific node to be chosen is 1/33 and this probability helps network does not trend to centralize because every masternode has same probability of choosing. Furthermore, every master node has same probability, and because voting process of stakeholder is randomly also, this helps every stakeholder in network have same probability of receiving reward.
- After being chosen, the masternode will produce a new block and set blocks' tag is pre-commit. The masternode broadcasts this block confirmation to the rest masternode and waiting response. And when receiving 2/3 masternodes acceptance (byzantine fault-tolerant algorithms), the new block will change status to commit.

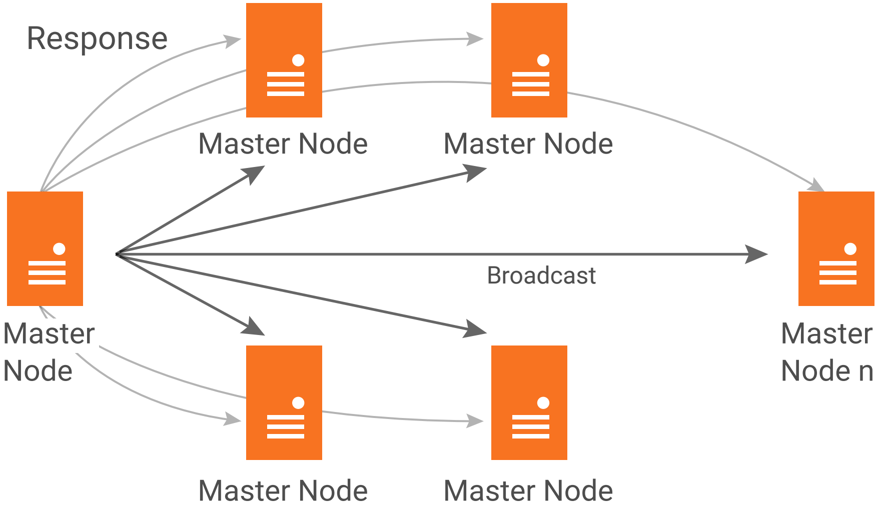
- If a producer misses a block and has not produced any block within the last 1 hour they are removed from consideration until they notify the blockchain of their intention to start producing blocks again. This ensures the network operates smoothly by minimizing the number of blocks missed by not scheduling producers who are proven to be unreliable.

3.5.1. Diagram/graphic of consensus algorithm:

Stakeholder Voting Master nodes diagram:



The selected Master node broadcast (running BFT) to another "Master node" and wait for 2/3 agreed vote. If a master node cannot be voted for :



Rewards:

- The master node after producing block will take reward by collecting all transaction fees of block.
- The master node will share reward with voters who voted for this master node.

Share percentage will follow this rule:

- Master node will receive 20% of reward.
- The remaining reward will be divided within voter based on the number of Heta coins that stakeholder has.

4. Account

One of blockchain's foundational technologies is cryptography, which is a branch of mathematics used extensively in computer security. Cryptography can be used to prove knowledge of a secret without revealing that secret, or prove the authenticity of data. These types of cryptographic proofs are mathematical tools critical to the operation of all blockchain systems. Accounts play a central role in HETA, they represent identities of external agents (e.g., human personas, mining nodes or automated agents). Accounts use public key cryptography to sign transaction so that the HETA network can securely validate the identity of a transaction sender

5. Permission and multi signature

Hetachain software allows each account to define levels of permission who can be vote and sign but cannot change the owner permission. Thus, there will be 2 main roles:

- Owner Permission: This permission has administrative powers over the whole account and should be considered for 'backup' strategies.
- Slaver Permission: Allows to access funds and some account settings, but cannot change the owner permission and is thus considered the "online" permissions.

Threshold = 80%.

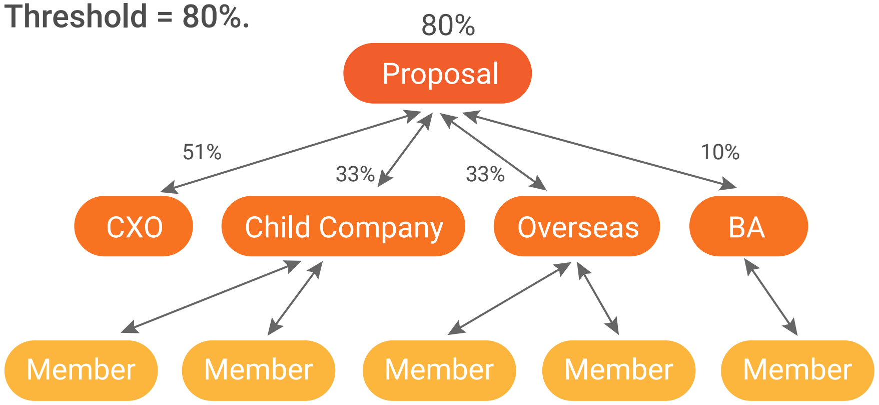


Figure 6 - Permission Diagram

For proposal 1, the owner (in this use case is CXO) can define the threshold, and when the owner cannot sign for this, Child company, Overseas and BA can support to get the proposal with Threshold = 80%.

6. Multi-Chain Blockchain Design

With HetaChain, we propose a multi-chain system Blockchain. In which users can use HetaChain for both public blockchain and private blockchain. The following diagram describes the system blockchain design

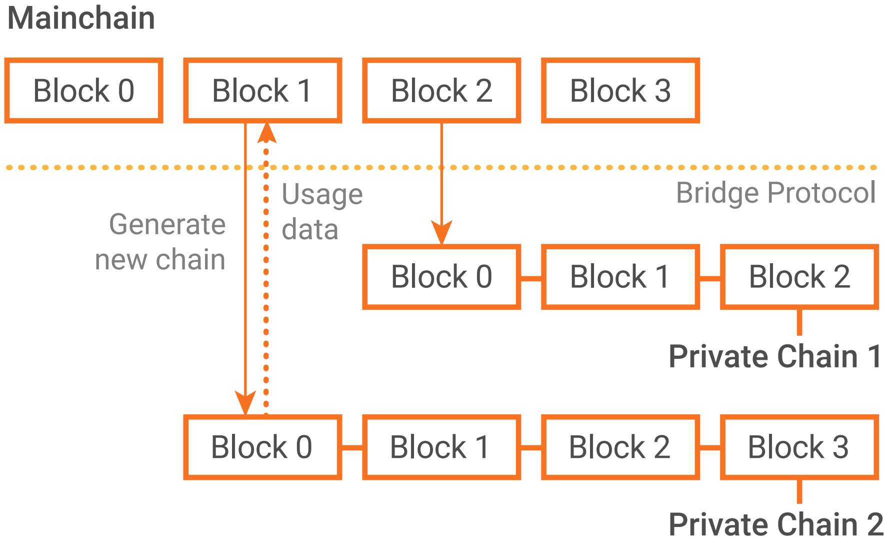


Figure 7 - Blockchain design

There is one Public Main Chain: that functions as a normal Public Blockchain (like Ethereum, Bitcoin…). Mainchain is the core of HETA, all public token will be store in Mainchain and be validated by master nodes (dPOS + BFT consensus). Besides, Mainchain can also generate to many private chain for private use. It links every transactions from other chains together to forge an immutable ledger. Every master node will main one duplication of Public Main Chain.

There are multiple Private Chains: that serve as private channels for different “client”. Here, we interpret a “client” as any company, organization, person,.. using platform. Client will control their own chain and communicate with Public Main Chain via communication protocol.

Bridge Protocol: We propose a Privacy-Preserving Bridge Protocol to link Private Chains to Main Chain. The intuition is that, while private transactions details are distributed securely over Private Chain channels, the Bridge Protocol provides a secure communication between Private Chain and Mainchain, abstracts details and creates cryptographic verifiable proofs on both chains to ensure system transparency and security.

6.1.Block structure

HETA is a replicated database that maintains a continuously growing list of ordered transactions called blocks. Each block has a link to the previous block, and once a block is recorded, the data in a block cannot be altered.

HETA's block consists of three segments which are Header, Data and Metadata. Both Header and Metadata are smaller segments as compared to Data.

Block Header

Block Data

Block Metadata

Figure 8 - Block Structure

6.1.1. Block Header

The header of each block consists of three items which are

- **ChainNumber:** the unique chain number is assigned sequentially starting from zero. The first chain is a special chain and it's Main Chain.

- **BlockNumber:** the unique block number. The structure of Block number is: BlockMainChainNumber – BlockNumber. The first block in a chain is special and is called genesis block which gets zero as its Number. So, the genesis block of a private chain generating by the second block of MainChain will have BlockNumber 2-0

- **PreviousHash:** hash of the previous block's header. The PreviousHash of the genesis block is set to NULL. The PreviousHash of the next block holds SHA256 hash of BlockHeader of the previous block.

- **DataHash:** hash of the data segment of the current block. The DataHash holds SHA256 hash of BlockData of the current block.

- **MainBlockHash:** hash of the block in MainChain generating the private chain.

Components	Size (bytes)
ChainNumber	8
BlockNumber	2*8+1=17
PreviousHash	32
DataHash	32
MainBlockHash	32
Total	121 bytes

6.1.2. Block Metadata

The BlockMetadata stores three Metadatas, each as a byte array in Metadatas field.
The four Metadatas stored in a block are:

- SIGNATURES: signature on the block creation.
- TRANSACTIONS_VALID: valid and invalid transactions in a block. TRANSACTIONS_VALID is a byte array of size equal to the number of transactions in the block. For each transaction, producer sets validation code in the byte array appropriately to represent the validation result.
- VOTE_LIST: a directory of voter who was voted for MasterNode. The structure of directory is: {address} » {voter's coin number}.

6.1.3. Block Data

Each transaction data is encoded as byte array and stored in the Block Data field. The length of the Block Data field is equal to the number of transactions encapsulated in the block

A transaction consists of transaction payload, permission tree and signatures. Transaction payload contains the actual transaction data and its Metadatas.

6.1.3.1. Transaction signatures

Transaction signature contains the list of signatures that every member in permission tree signs to this transaction. The transaction signature will be formatted: {signature:

6.1.3.2. Permission tree

Permission tree is defined as a hierarchical tree presenting the percentage of member's effect to transaction.

6.1.3.3. Payload

A payload contains transaction details. In payload, it consists of:

- Timestamp: the time the transaction is created.
- Expiration: the time after the transaction has expired.
- Scope: specifies the range of data that may be read and/or written to. If a message attempts to read or write data outside of the scope, then the transaction will fail.
- Channeled: contains the identifier of the channels.
- Transaction ID: contains the identifier of the transaction. The transaction id is the hash of the transaction (256 bit).

- From: the account that sent the transaction.
- Balance: the amount of HETA coin in the “from” account.
- To: the account the transaction is sent to.
- Value: The amount of HETA to sent.
- TransactionType: defines the type of transaction.
- Data: Transaction can define its own data. A data could be an arbitrary message or function call to a contract or code to create a contract.

6.1.4. Transaction Fee

The Transaction fee is a HETA transaction fee that is charged to users when performing transactions. The fee is collected to reward producer and voters for maintaining the HETA network. Transaction fee will be calculated based on 2 parameters:

- Transaction complexity: more complexities, more transaction fees. The transaction complexity calculates based on permission tree. Having more leafs and more levels mean more complexities.
- Transaction size: transaction size is the total of data inside transaction, include: sender’s address, receiver’s address, signatures, permission tree, additional data.

HetaChain is configured to increase 5% annually for coin supply

6.1.5. Transaction flow

- There is a transaction contained permission tree. Transaction will be sent to every member on permission tree. Members decide on either signing this contract or not.
- After completing signature phase, HETA platform sends transaction to blockchain to verify.
- Once transaction is valid: when transaction data is correct and transaction has enough signature.
- When verifying whether a transaction is valid, HETA will add this transaction to TRANSACTIONS_VALID metadata while validation code is VALID.

6.2.Mainchain

Main Chain is the public chain of Heta Blockchain system and can be validated by 33 Master nodes (BFT-DPOS Consensus). Every activity of system will be committed to Mainchain. The following diagram will describe in detail what Mainchain is:

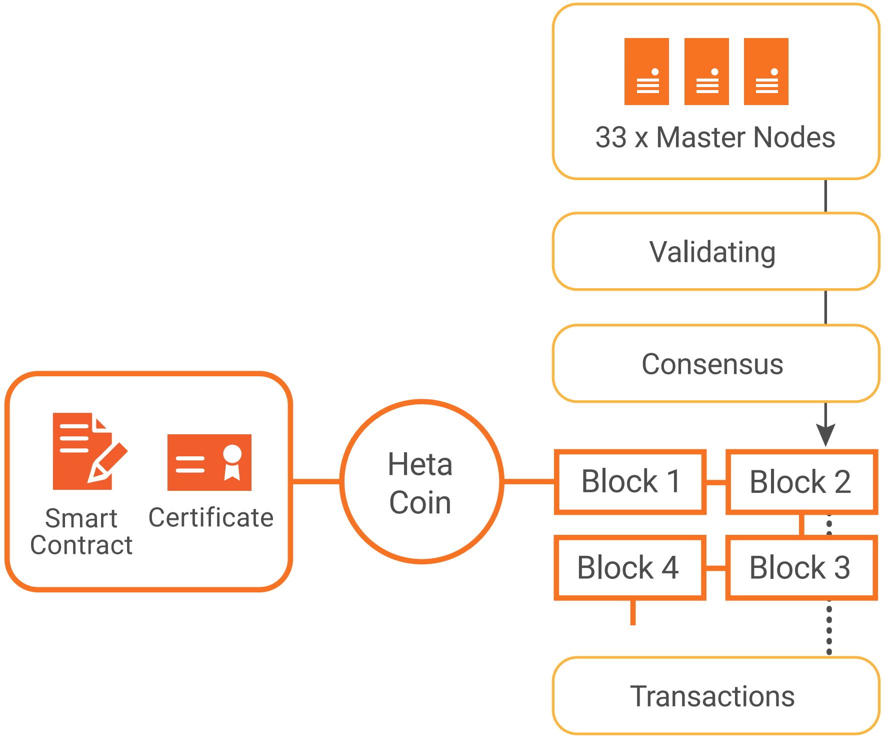


Figure 8 - Mainchain design

6.2.1. Peers

In Mainchain, each master node will contain a ledger data of Mainchain. Those nodes can update realtime peer-to-peer as well.

6.2.2. Public Token

In Heta Blockchain system, we also introduce public Token. Any user can develop their own token running in Heta Blockchain via our Smart Contract.

6.2.3. Smart Contract

Smart contracts are high-level programming abstractions that are compiled down to HVM bytecode and deployed to the HETA MainChain for execution. Developing smart contracts requires a defined database schema to track, store, and find data. Developers commonly need the same data sorted or indexed by multiple fields and to maintain consistency among all the indices. The smart contract defines the format of each transaction in the Main Chain.

6.2.4. Smart Contract Lifecycle Management

The system handles full Life cycle Management of each smart contract as digital assets, including the completely controlled management of submission, deployment usage, and cancellation. Furthermore, with integration into the right management mechanism, comprehensive smart contract management is successfully implemented.

6.2.5. Smart Contract Template

Through active adoption by several business models and processes within different business domains, a general smart contract template is gradually formed, which can support flexible configurations for a multitude of scenarios.

6.2.6. HETA virtual machine (HVM)

The HETA virtual machine is designed to serve as a runtime environment for smart contracts based on HETA platform. HVM is sandboxed and also completely isolated from the network, filesystem or other processes of the host computer system. Every Master node in the network runs an HVM implementation and executes the same instructions.

6.3.Private Chain

Private Chain is private blockchain in HETA platform with constrained read/write access alongside a consensus algorithm(BFT-DOPS) which allows only a pre-selected group of people to contribute and maintain the integrity of the blockchain.

6.3.1 Private Chain Registration

When an organization wants to join HETA platform, he has to install HETA SDK package and open a HETA wallet. HETA SDK package aims to create connection with Bridge Protocol and send information to main chain. The HETA wallet will be used to pay usage fee from Private Chain to Main Chain.

6.3.2 Private Chain Consensus Algorithm

Private Chain uses BFT-dPoS consensus algorithm as well, Detail about BFT-dPoS consensus algorithms ris referred in the part number 3. Consensus

6.3.3 Private Chain Usage Fee

When registering and using services, Private Chain has to pay usage chain.

- The total complexity creates blocks. The total complexity equals sum of complexity to create each block. The complexity to create a block equals sum of complexity to create transaction within this block.
- The number of block

6.3.4 Private Chain Token

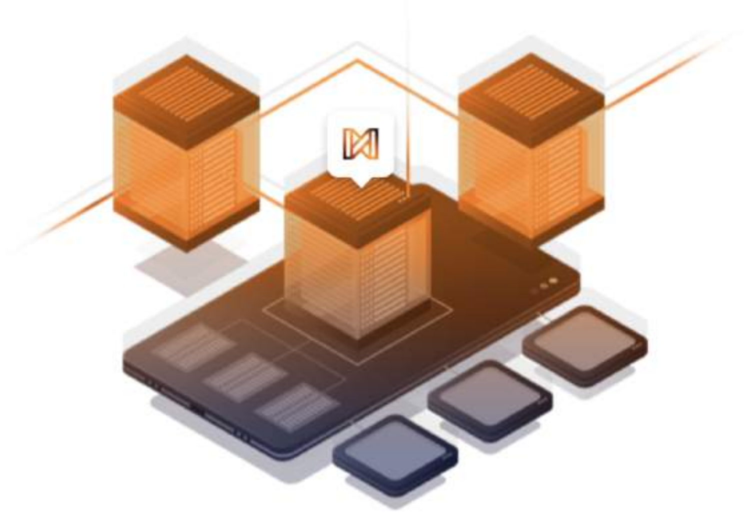
Private Chain also can create token using within this Private Chain.

6.3.5 Private Chain Smart Contract

Private Chain also supports to create smart contracts working within this Private Chain. Those smart contracts connot public outside this Private Chain.

7. Heta Protocol

To communicate between Private Chains and Mainchain of Heta system, we provide Bride Protocol which can help private chains submitting their data to main chain for validation. Actually, each private chain needs to pay usage fee (via Heta coin) when using. Private chain will pay an amount of Heta Coins in order to issue transactions. This fee is configurable, depending on huge usage.



8. Heta Coin

We introduce HETA, an internal crypto-currency to use inside MainChain. HETA is used by Enterprise/user (who using Heta Blockchain service) to pay "usage fee”.

We propose these ways of using HetaCoin.

- When a user creates a transaction to exchange their coins or token made by Heta, he must pay a pre-defined amount of HetaCoin. This is also called Transaction Fee. This mandatory fee is what makes HetaCoin has real value to the system. It also prevents merchants to flood the network with unlimited micro transactions.
- When a user participates in the consensus/validation process of a PrivateChain or MainChain, he should be rewarded with a certain amount of HETA. This is also called Endorsing Reward. The rate of consensus reward should depend on how much effort the participant spends in the process.

9. Cryptography Algorithms

Every account is defined by a pair of keys, a private key and public key. Accounts are indexed by their addresses which is derived from the public key by taking the last 20 bytes. Therefore, account addresses and digital signatures are derived directly from private keys, but the private keys are not used directly in the platform protocol in any way.

Public key cryptography (aka "asymmetric cryptography") is a core part of modern day information security. It uses unique keys to secure information. These keys are based on mathematical functions that have a special property: it is easy to calculate them, but hard to calculate their inverse. Based on these functions, cryptography enables the creation of digital secrets and unforgeable digital signatures which are secured by the laws of mathematics. For example, multiplying two large prime numbers together is trivial. But given the product of two large primes, it is very difficult to find the prime factors (a problem called prime factorization). Let’s say I present the number 25009997 and tell you it is the product of two primes. Finding those two primes is much harder than it was for me to multiply them to produce X.

Some of these mathematical functions can be inverted easily if you know some secret information. In our example above, if I tell you that one of the prime factors is 4999, you can trivially find the other one with a simple division: 25009997 ÷ 4999 = 5003 . Such functions are often called trapdoor functions because they are very difficult to invert unless you are given a piece of secret information that can be used as a shortcut to reverse the function.

A more advanced category of mathematical functions that is useful in cryptography is based on arithmetic operations on an elliptic curve. In elliptic curve arithmetic, multiplication modulo a prime is simple but division (the inverse) is practically impossible. This is called the discrete logarithm problem and there are currently unknown trapdoors. Elliptic curve cryptography is used extensively in modern computer systems and is the basis of HETA's use of private keys and digital signatures.

In HETA, we use public key cryptography to create the public–private key pair we have been talking about. They are considered a "pair" because the public key is derived from the private key. Together, they represent an HETA account by providing, respectively, a publicly accessible account handle (the address) and private control over access to any HetaCoin in the account and over any authentication the account needs when performing other actions. The private key controls access by being the unique piece of information needed to create digital signatures, which are required to sign transactions to spend any funds in the account or performing any action on its behalf.

9. 1 Private keys

A private key is simply a number, picked at random. Ownership and control of the private key is the root of user controls over all funds associated with the corresponding HETA address. The private key is used to create signatures required to spend HetaCoin by proving ownership of funds used in a transaction. The private key must remain secret at all times, because revealing it to third parties is equivalent to giving them controlled over the HetaCoin secured by that private key. The private key must also be backed up and protected from accidental loss. If it's lost, it cannot be recovered and the funds secured by it are lost forever too.

Creating an HETA private key is essentially the picking a number between 1 and 2^256. The process can be done offline, it does not require any communication with the HETA network, or with anyone at all. As such, in order to pick a number that no-one else will ever pick, it needs to be truly random.

9. 2 Public keys

An HETA public key is a point on an elliptic curve, meaning it is a set of x and y coordinates that satisfying the elliptic curve equation.

In simpler terms, an HETA public key is two numbers, joined together. These numbers are produced from the private key by a calculation that can only go one way. That means that it is trivial to calculate a public key if you have the private key, but you cannot calculate the private key from the public key.

To generate a public key, we need to start with a private key in the form of a randomly-generated number k, multiply it by a predetermined point on the curve called the generator point G to produce another point somewhere else on the curve, which is the corresponding public key K. The generator point is specified as part of the secp256k1 standard, is the same for all implementations of secp256k1, and all keys derived from that curve use the same point G:

$K = k * G$

Where k is the private key, G is the generator point, and K is the resulting public key, a point on the curve. Because the generator point is always the same for all HETA users, a private key k multiplied with G will always result in the same public key K. The relationship between k and K is fixed, but can only be calculated in one direction, from k to K. That's why an HETA address (derived from K) can be shared with anyone and does not reveal the user's private key (k).

9. 3 Addresses

A cryptographic hash function is a one-way hash function that maps data of arbitrary size to a fixed-size string of bits. The input to a hash function is called a pre-image, the message or simply the input data. The output is called the hash. A special sub-category of hash functions is cryptographic hash functions, which have specific properties that are useful to secure platforms.

HETA addresses are unique identifiers that are derived from public keys or contracts using the Keccak-256 one-way hash function. Then we keep only the last 20 bytes (least significant bytes), which is our HETA address.

10. Roadmap

Q1 & Q2/2018

Design HetaChain architecture

Draft HetaChain whitepaper

Q2 & Q3/2018

Testnet development

Block Explorer development

Wallet MVP

HetaChain ICO private sale

Q4/2018

Revised Whitepaper

Block explorer public demo

Testnet complete

Side chain development

HetaChain ICO public sale

Q1/2019

Test net public launch

Web portal public release

Dapp development (for Dapp Store)

Smart contract development

Wallet updates (multi token support)

Listing HETA token on exchange

Q2/2019

Launch Dapp Store

Drag and drop Dapp Creator

HETA transaction fee calculator

Block explorer (update)

Mainnet complete

Q3/2019

Side chain development complete

HetaChain Mainnet public launch

11. Co-Founding Team

Mr. Sultan Ali Lootah

**(Chairman and Managing Director -Relam Investments)
Co-founder,
Chairman & CEO**

Sultan Ali Lootah (Chairman and Managing Director -Relam Investments). Is a business oriented entrepreneur carrying an MBA in Strategic Management along with experience in both public and private sector. Lootah was able to move towards establishing various businesses such as Vault Investments, vault & Partners and Vault Management Consultants. Looking towards new markets Lootah decides to move internationally and focus on emerging Asian new market, where Vietnam & India came as a point of interest and after a productive communication with large Vietnamese business officials, Relam Investment was established as partnership between Vault investments and Vietnamese high-level businessmen.

Sultan A. Lootah is an entrepreneur whose vision falls in moving towards facing challenges and creating opportunities out of it. Coming from a family those who are businesses oriented, along with his long experience in both public and private sector. Lootah was able to move towards establishing various businesess starting with YourGuide Marketing Company in 2009 followed by Fourth Dimension IT Company to them move a level up by establishing Vault Investments in the year 2012, acting as the investment arm for all investments opportunities within the companies or the family business.

Vault Investments expanded in business where Lootah is chairman of the board and the managing partner entered various business sectors by establishing Vault Smart IT Solutions, Sultan Lootah petroleum trading company, Vault Management Consultants and Vault Real Estate.

Lootah occupied role of the Chief Executive Officer in the Mohammed bin Rashid Al Maktoum Foundation, until July of 2014. On 2015 Lootah was chosen by the Korean government to be the honorary ambassador for investment. Later Lootah formed along with Norwegian business men a Norway - UAE chamber of commerce.

Lootah brought to the Foundation a rich experience and outstanding competency in developing innovative and goal-oriented solutions. His exceptional leadership qualities and acumen for critical thinking made him an obvious choice to lead the Foundation's initiatives that aim to combat unemployment in the Arab world. Lootah was responsible for overseeing the conceptualization and implementation of programmes that drive employment opportunities and entrepreneurial activities across the region.

Lootah was responsible for overseeing the conceptualization and implementation of programmes that drive employment opportunities and entrepreneurial activities across the region.

Prior to joining the Foundation, Lootah served as Director of Projects at The Executive Office (TEO) in Dubai, where he led the development and implementation of key initiatives for consolidating the Emirate status as a global economic force.

As the Director of Information Technology in the Dubai Department of Economic Development (DED), Lootah played a key role in formulating the department's strategy and bolstering its overall efficiency. Projects that he spearheaded at DED included Tawtheeq, an electronic processing system that helped the department achieves its goals and objectives.

In 2005, Lootah led the upgrading of DED's IT infrastructure and introduced Infotech, the region's first portable trade license application specifically designed for the department's end-users.Starting his career as a software programmer at Mashreq Bank (1998-99), he was associated with the Public Prosecution department for a year. In 2000, he moved to Al Thuraya Telecom as a Testbed Engineer, before joining DED in 2003 as an IT software development supervisor.

A member of the Mohammed bin Rashid Programme for Leadership Development, Lootah graduated for the Higher colleges of Technology in the United Arab Emirates with a Degree in Business Information Technology. Lootah also holds an, Dubai and an Executive Graduate Diploma in Public Administration from the National University of Singapore - Lee Kuan Yew College.

Sultan holds Executive MBA from the Higher Colleges of Technology with a concentration in strategic management. A recipient of several awards including the 2006 Dubai Government Excellence Award for Best Distinguished Government Employee, Lootah has also contributed to the success of prominent initiatives, including the Dubai Summer Surprises (DSS).

Mr. Abdulla Ali Lootah is a Board Member and partner in Relam Investment, he is also the Vice Chairman & Partner in Vault Investment. A highly motivated entrepreneur with B.S in Civil Engineering from Arizona State University USA, & Higher Colleges of Technology, UAE. Having successfully accomplished projects like Solar Water Desalination, Bridge Design Project, Highway Road Design Project, Water Supply Management Project, Trakhees Offices Remodeling Project. His expertise in key account management and strategy, as well as his keen leadership skills and knack for innovation, have rendered him indispensable to all his ventures. His role includes market research, forging and maintaining relationships with customers and overseeing operations in the sales division of the company.

Mr. Abdulla Ali Lootah

Co-founder

Mr. Hong Phuc Do

Co-founder & CSO

Mr. Hong Phuc Do is a Board Member of Relam Investment. In Vietnam, he holds position as Chairman and CEO of MIG HOLDINGS, a Finance Investment Company which specialises in many industries such as: Finance, Trading, IT, Real Estate and supporting for start-up projects. Mr. Phuc also is co-founder of PPP Investment & Trading Joint Stock Co. and NIB Investment & Technology Development Joint Stock Co..

According to he has talents in Leading Management, Entrepreneurship and Information Technology, Mr.Phuc manages corporation direction and strategic planning for all of his companies. Furthermore, he has facilitated company activities in many aspects of consulting, sales, marketing.

Before establishing MIG Holdings, Mr. Phuc had experiences of working as Quality Assurance Manager in SAMSUNG VINA Corporation;
Business Development Manager in Vietnam Enterprise Institute and
Business Leader in Mobifone Corporation.
Especially, he serves as a Board Member of STI Law Firm in Ho Chi Minh City.
In education, he has a Bachelor degree of Economic which certified by Van Lang University.

Mr. Nagesh Ananth Prabhu

Co-founder%61

As an energized and self-motivated an Entrepreneur and a IT professional with total experience of more than 18 years in providing turnaround management, performance improvement and corporate advisory services to companies in U.A.E, Singapore, Malaysia, Cyprus, United States and more. He is excited by the opportunity of contributing his business experience and his proficient skills in Database Administration, Business Management and Human Resource Management and managing turnkey projects in esteemed organizations. He is experienced and highly skilled in Business Management and Strategy Management, IT operations, solution architecture, assessment and strategy development has been well honed due to working in the industry during its booming era. He has a proven track record of providing leadership in the evaluation, selection and implementation of new information systems technologies and has been involved deeply in full scale implementation of core IT projects in companies. He has worked in different capacities in top management positions at leading industrial houses in India and UAE. Within Relam Investment his as a Chief Program Office role covers the full aspects of $usiness 5upport and Technology Investments and Projects across all sectors verticals.

Mr. Norman Khan

Co-founder

Executive Director / CEO Aston Roth International

Norman has over a decade experience trading in oil and petroleum products. Norman has led numerous commercial roles including the supply of refined and unrefined products within the global market, dealing directly with oil producing countries, global refineries and the end user.

Norman has served as Non-Executive on the advisory board for Vault Investments L.L.C in Dubai, and is currently executive advisor to Dubai and Singapore based hedge fund. Norman is a UK national and holds a BA (Hons) Major in Business Management and Manufacturing Management from the University of Hertfordshire.

Mr. Abdullah Al Dabbous

Co-founder

Founder & Managing Partner of Myfatoorah, Kuwait

Graduated from Arizona State University and a MBA from INSEAD, Paris Area, France who is committed to constant growth, Abdullah has earned a reputation as a visionary and launching initiatives into unchartered financial territory. He proudly leads MyFatoorah which currently supports thousands of satisfied business owners in the Middle East to handle their daily transactions from all around the world with the ease of a button's touch.

In his early days, he has been associated with Ernst & Young as a Senior Analyst for the Valuation and Business Modeling team in Kuwait, performing high-quality valuations of companies and individual assets for various sectors. Providing insights to his clients on the price or value of businesses shares or commercial assets as well as building, reviewing and implementing strong business modeling solutions. He has also been a part of the Transaction Support team, performing Buy/Sell-Side due diligence, restructuring and feasi-bility study services for client in the oil and gas, contracting, banking and finan-cial sectors.

Mr. Mohammed AlNakhi

Co-founder

Mohammed AlNakhi is the HSE Lead & Technical Manager for BP in the UAE. He started his career in 2002 after receiving a Bachelors of Science degree in Mechanical Engineering from Virginia Polytechnic Institute and State University (Virginia Tech). He is also a Chartered Mechanical Engineer by the Institute of Mechanical Engineers (IMechE) in the UK, in addition to having a Graduate Degree in Public Administration from the Lee Kuan Yew School of Public Policy at the University of Singapore, and a graduate of the Mohammed Bin Rashid Program for Leadership Development – Young Leaders and the Sharjah Leadership Program (AUS), and a Graduate Diploma in Sports Management (University of Sharjah). His career has taken him to different locations around the world.

In 2002, he joined BP as a Projects and Integrity Engineer in Sharjah and was also enrolled in BP's fast track graduate 'Challenge' Program.

Since then he has worked in Abu Dhabi, the UK, and South Korea for various BP Projects.

Mohammed is focused on helping BP support their Joint Venture Partners in Abu Dhabi through the Corporate Governance Meetings, in addition to actively working with ADNOC and the other Shareholders.. He also sits on the investment committee of 'The Catalyst,' a start-up accelerator JV between Masdar and BP which focuses on startustainable CleanTech to support a local entrepreneurial ecosystem and foster.

Mohammed also serves as an advisor for Vault Investments.

12. Advisory Board

Mr. Michael Gord

Michael Gord is a full stack blockchain developer and the founder and CEO of MLG Blockchain, an enterprise blockchain and ICO consulting and development firm, the co-founder of StratX, a global liquidity solution provider, and AirdropX, a social platform for tokens to globally distribute their tokens in with airdrops. Michael was the first enterprise blockchain developer at TD Bank, one of the largest Canadian banks.

Michael is also a director of the Blockchain Education Network, a robust global network of blockchain enthusiasts, sits on the board of directors of the Blockchain Association of Canada, is an advisor and investor into several prominent blockchain ventures and writes for Bitcoin Magazine in addition to several other fintech publications.

Michael holds a degree in Entrepreneurship and Marketing from the Desautels Faculty of Management at McGill University, where he founded the McGill Cryptocurrency Club and co-founded the McGill Students Fintech Association. After graduating, Michael made the first donation of bitcoin to the McGill Alumni Association.

Mr. Samer Obeidat

Mr. Obeidat is a global serial entrepreneur, researcher, and an impactful investor. He has over a decade of experience in leading successful technology startups, business consulting and fintech. In 2013, Obeidat built the first online investment platform for spot precious metals deliverable contracts, and was involved in the investment of over a billion US$ in the gold markets in the EMEA in 2016. In 2017, he founded Investifai, an artificial intelligence (AI) powered wealth management startup, producing higher risk-adjusted returns than most of the traditional investment managers.

Obeidat holds a BA degree in applied chemistry from Jordan University of Science and Technology (JUST), and a masters' degree in Global Management (MGM) from Royal Roads University in Victoria, BC, Canada, where he conducted an empirical research that focuses on managing global multi-asset investment portfolios using machine learning models.

Mr. Shameer Thaha

Shameer Thaha is a serial technopreneur on a mission to liberate 7 billion creative minds. He is the CEO of Accubits (MENA), a technology company that focuses on AI and Blockchain. Accubits is one of the world leaders in Blockchain and ICO technology with operations in Middle East, Indonesia, Singapore, Hong Kong and USA. Accubits had the distinction of being featured in the Inc42's Startup Watchlist as one of the top 13 Blockchain companies to watch out for the thanks to its futuristic products in 2018. Some of the company's most notable clients are NASA, USPS, Landmark group and Dubai Smart Government.

He holds an MBA from S P Jain School of Global Management and a Bachelor in Engineering from Kerala University. He has worked with corporations such as Infosys, Microsoft and has transformed businesses from concept to multi-million enterprises. He has over 15 years of industry experience and is passionate about building high performing teams and improving efficiencies. He is a published author and a speaker at global conferences.

Shameer is an advisor at the Global Skill Development Council and also selectively advises high potential companies with their ICO, Blockchain or AI implementations.

Mr. Sanjay Chandel

Sanjay Chandel is a professional with over 22 years of rich experience in both Regulatory and business environment. after serving SeBi for over eleven years including in the office of the Chairman, he worked with Indiabulls Group for past 7 years until april, 2014. During his stint with indiabulls Group, he was instrumental in launching its Commodity exchange Venture and later asset management business, in both these ventures he was the CEO. He carries rich experience in real estate (Re) sector as well having advised conglomerates engaged in Re business in raising and deployment of funds, monetization of land banks and structuring of large Re deals. Currently he is involved in investment banking, apart from advising a number of large corporations on Infrastructure financing, business development and compliance mechanism.

He has done MBA in Finance from Mumbai University

Mr. Lorenzo Giombini

Graduated in Business Management in Italy, Lorenzo Giombini stated his business activities as market research operator in the fields of telecommunication, real estate, automotive and other public activities.

In 2007 founded IL LARIBINTO, a non-profit organization for the fund rising to support projects activities for dyslectic students and their families; also technical and strategic trainings for teachers and educators.

From 2009 to 2015 he became General Manager of e.TEC, a facility management company, working with the main real estate entities in Italy and investment and banking players like Enpam Foundation, Monte dei Paschi di Siena, Unicredit, Cofely...
From 2010 to 2012, he cooperated with EGM Services Consulting Srl, in Italy, for a strategic and technical advisory on real estate big projects.

In 2015, he founded VAULT PARTNERS, A Dubai Management Consulting company was operated as a strategic consultant for real estate project and international investors.

In 2016, he became board member and investment advisor of VAULT INVESTMENTS LLC, working on UAE and international projects with strong and high professional relation with Mr. Sultan Ali Rashed Lootah and Abdullah Ali Rashed Lootah.

Mr. Manish Mittal

An entrepreneur & career technologist with more than 20 years of global accomplishment-laden experiences in IT. A serial solver of problems, with an intimate knowledge of business models in both at the corporate and operational levels. Have a flexibility in responding to changing market conditions & ability to "wear many hats" in the effort to meet & exceed corporate goals and challenges. Have provided leadership through start-up, growth, and turnaround situations, and have been able to deliver strong and sustained results. A strong leader in challenging environments requiring energy, an ability to multi-task combined with maintaining an eye for detail, exercising pragmatism and working with the team. Experience of turn-around, organic growth, new service, acquisition and transformation situations – with a strong focus on customer satisfaction and team play.

An individual in love with technology and ever excited with its power to make the world for better.

Mr. Michael Gong

Co-founder & CEO at Bonway IInvestment, Dubai, U.A.E, Co-founder & CEO at Tianjin Sijian Construction & Engineering, Founder at BGT.General trading & Food Stuff Ltd.co, Founder at JSS international Shipping LLC, Founder at Lava Hospitality (created own brand “kanpai” “al Finique” “best shawarma ”).

With over 20 years of experience managing companies in Construction & Engineering, Shipping & Logistic, trading between China & Middle-East, F&B hospitality, Michael has gained great position in the market. From infrastructure to operation, business development and marketing, Michael has an impeccable attention to details and great sense of operational excellence that has led some of its projects to great opportunities.

Mr. Kunal Kothari

He is the elder son of the Founder and Chairman of the Prithvi Group, Mr. Kunal Kothari. He started his career at the age of 20 by joining the traditional family business of Commodity Market in 2003. He introduced the revolutionized commercial working pattern to the family business. He started the venture Prithvi Finmart in 2011 which deals with Currency and Equity Markets, making the Prithvi Group an established Broking House. When he joined the family business, the parent company Prithvi was run by just three employees. With a foresight vision, and by adapting new age technology, the parent company has witnessed a substantial growth and now has 100 employees and over 500 Associates across the country. Mr. Kothari has also expanded his parent company, and now has a prominent name in the field of Real Estate, NBFC, Outdoor Media and Organic Foods. He has expanded the established broking house into a blooming conglomerate having his footprints over various business ventures.

Mr. Ismail EL Sakka

Graduating from the University of Cairo with a bachelor's in commerce during 1986. Mr. El Sakka is the founder and Chairman of International Auditing & Consultancy Centre (IAC) offering a wide range of financial non–banking services and corporate solutions since 1994 within the United Arab Emirates and Egypt, furthermore he operates as a financial expert in Dubai courts as well as a Commercial Arbitrator. The initially chartered accountant Mr. El Sakka is one of the members in the Arab Organization for Certified Accounting Experts. With more than 25 years of experience within emerging and frontier financial markets Mr. El Sakka is currently the financial consultant to the Chinese Business Union in Dubai. Being Vice president to EBR partners LLC. Mr. El Sakka is also Vice Chairman and Founder of E Business Review economic magazine License in London. IAC Egypt is a Business partner of Integrated Marketing solutions as well as MMD Information Technology one of the leading High-Tech Egyptian firms. IAC Egypt as opposed to Dubai started out in the process of liquidating companies in financial difficulty to the Egyptian Private Equity industry such as the sale of Modern Family Foods to Cairo Capital and ADI both development and Investment funds. Most recently IAC Egypt is a strategic partner to BDO Esnad in Cairo and is to sign a business partnership within the third quarter of 2018.

HETACHAIN

Suite 102, Cannon Place, P.O. Box: 712, North Sound Rd.,
Grand Cayman, KY1-9006, Cayman Islands.
bd@heta.org | www.heta.org

An investment by:

ريـلام للاســتثمار
RELAM INVESTMENT