Revolutionize Voting by Volitium

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1. Introduction

Our name "Volitium" originates from the English word "Volition", which is defined as the power to make your own decisions, with the suffix -ium to suggest an element with metallic properties. Volitium's mission is to promote digital voting which is empowered by blockchain technology and smart contracts. Volitium will build a tool which involves encrypted instant messaging communication, blockchain, smart contracts, digital wallet and smart ID. All these aim to ensure convenient participation, while the right to participate, untampered records, privacy, confidentiality, anonymity, and real identities are ascertained. By freeing such exercises from the limitations of time and place, this allows people to express their opinions more freely and conveniently. This in turn will help increase participation in communal decision-making, thus enhancing social consensus.

Our plan that leads us to such a target will be presented. When the application of Volitium is widely adopted, value will come about naturally, citing from the examples of Bitcoin and Ethereum. How volitium creates value will be discussed.

Though Volitium's focus is mainly on putting public chain applications into the mainstream, we will also develop disruptive technology. The combination of lightweight nodes in smart phones and full nodes using single board computers such as Raspberry Pi will help to save cost for operating nodes. As Volitium is using random proof of stake ('POS') to achieve distributed consensus, hardware processing speed is not as demanding as distributed consensus through proof of work ('POW'), the move to 5G technology makes such development possible. Moreover, peer to peer instant messaging communication will also be used to enhance efficiency. We will further discuss these in the technology section.

https://volitium.com has started to conduct online surveys on the stock market, property market, and consumer sentiment since June 2019. Starting from August 2019, volitium.com surveys were conducted with the Blockchain prototype, readily recording questions and answers, while respondents remained anonymous. There were 25 registered members at the beginning, rising to 86 registered members through August 2019. These people are first backers helping to test the Volitium survey platform and blockchain prototype. They were rewarded with gift points. We envisage that when the volitium mainnet is ready, gift points will migrate to crypto coin, and they will have the choice of becoming stakeholders. (This will be discussed in the 'Proof of Stakes' section.) We hope that blockchain will eventually be widely used for many different kinds of surveys, public polls and votes.

As the credibility of digital voting grows, we would like to see more discussion about possible reforms to the democratic process that eliminate middlemen and proxies and enhance deliberative processes. This is discussed at the end of this paper.

2. Application in Surveys and Votings

- *How blockchain can enhance the trustworthiness of surveys*

When political opinions are polarised, as in the Brexit referendum and the 2016 American presidential election, voices of political moderates were often overshadowed in the media by the more vocal ones. These votes ended up sending shockwaves through the financial markets.

Opinion polls can make the problem worse. Pre-election surveys' results should indicate an election outcome, but they can actually distort the outcome. For example, if surveys show a particular candidate is likely to win an election, fewer voters may show up to vote. Politicians and institutions spend millions of dollars conducting pre-election surveys. As surveys play such an important role in the pre-election campaign, their results are controversial. Are pollsters asking the right questions? Does the wording of the questions influence the answers? Are survey results being used selectively or misleadingly? Some people may even question whether the surveys had been conducted at all!

Government may consult residents on policies or developments that affect the living environment or a neighborhood. However, many people don't even pay attention to notice boards outside construction sites seeking opinions. Municipal 'town hall' meetings for a public consultation take time to attend and may attract unrepresentative attendees with strong views. The integrity of online opinions polls is often questioned. Consultation exercises can be rigged to achieve a distorted outcome.

Blockchain's open record and tamper proof system solves the problem of trust. Surveys' questions and answers recorded on blockchain can be verified and monitored by the public, ensuring that they remain unchanged at the time the survey is carried out and after it is completed. This would improve the trustworthiness of surveys, which is particularly important in pre-election polls and politicians' approval ratings, which may influence people's viewpoint and their choices. Moreover, respondents can answer questions at their leisure time when riding on a bus or at a coffee shop; this will boost surveys response rate, which would improve the credibility of surveys or public opinion polls.

- *Blockchain Application in Voting*

In addition to surveys, blockchain's immutable and traceable records, transparency and anonymity also serve well for voting. Voters can check if their votes were cast and counted as intended. The distributed ledger shared on multiple computers assures votes are untampered with, and open records can be verified by the public.

Voting at polling places badly needs reform. Queuing at polling stations can be frustrating. The US Midterm Election in 2018 exposed the shortcomings of the current voting methods. With the highest turnout rate in more than a century, long queues and broken voting machines caused frustration. In some areas, the number of polling places may be reduced due to government budget cuts or attempts to suppress the turnout.

As well as federal or provincial level elections, there are all sorts of group decisions involved in communities and companies in our daily life. Issues such as development, conservation and provision of public facilities require community deliberation and consensus-forming. Voting to choose boards of directors for companies, condominiums and other bodies are also very practical applications. We see a great demand for new methods of voting that bring efficiencies, boost turnout rate, reduce the chances of frauds, and enhance democratic participation.

- *Voting for Boards of Directors and Management in Condominiums*

Condo owners elect boards of directors to control owners' management fees and reserves and award contracts for property management, security, repair, and cleansing. Proxy ballots have often been abused. Corruption can occur as board members may be related to contracting companies or accept bribes from them. We believe that the transparency of blockchain would be an answer to this problem. Tamper-proof open records on blockchain protect the election process, and ballot casting and counting can be verified by everyone. Voters with the Volitium voting app on their mobile phone can vote at any time and anywhere they want within the voting time frame. Obviously, transparency on blockchain should not expose voters' choices. A Volitium Instant Messaging with digital wallet will

be developed to guarantee the anonymity of voters and their choices. As voting online becomes more convenient and secure, turnout rates will be boosted. This would help eliminate proxy holders, and also save voters' travelling time to polling places.

As voting can be done at any place and any time, and the data integrity is ensured, we foresee greater involvement by residents in the details of property management. This can allow residents to choose the interior decor of common areas, appointment of management company, etc., with the majority able to decide. In this way, residents can have more control, and the board of directors' role will be more focused on coordination and execution of residents' choices.

- *Voting for Business*

During the process of preparing this white paper, the world is hard hit by COVID pandemic. Never before, world cities were locked down, and countries' borders were shut down. Employees were required to work from home. Executives and world leaders held conferences online. After business conferences and negotiations, officers or various parties need to make decisions by voting. How can we ascertain that the person conferenced on the Zoom screen or Google Meet screen is the same person who cast the ballot? The authenticity of voting can be questionable. Therefore, developing an accountable electronic voting system is the next big step for making business deals.

3. A New Method to Fund Surveys/Polls

Large scale surveys may be costly and a barrier to individuals and small companies. We hope that anyone or any small community with a topic or an issue to research may have a channel to raise funds to support their surveys. Therefore, Volitium incorporates crowdfunding features for surveys - the issue receiving the highest number of ballots would be crowdfunded. Sponsors supporting a survey will buy Volitium, which will be used by event managers to buy 'Right' (See Technology section 10(b) - 'What is Right') and pay for the execution of smart contracts. Funds can also be used to pay remuneration to respondents of the survey.

4. Pilot Project: Opinion Based Rating System for Financial Markets

The purpose of a pilot project is to kickstart initial usage and provide a small scale testing ground. This is also to ensure income for operating nodes while Volitium is at its developing stage. We will kickstart volitium by forming an opinion based rating system which specifically applies to the financial market.

As a financial analyst myself and a blogger since 2011, with my online network that I have built over the years, I am most capable of leading the formation of an opinion based rating system which
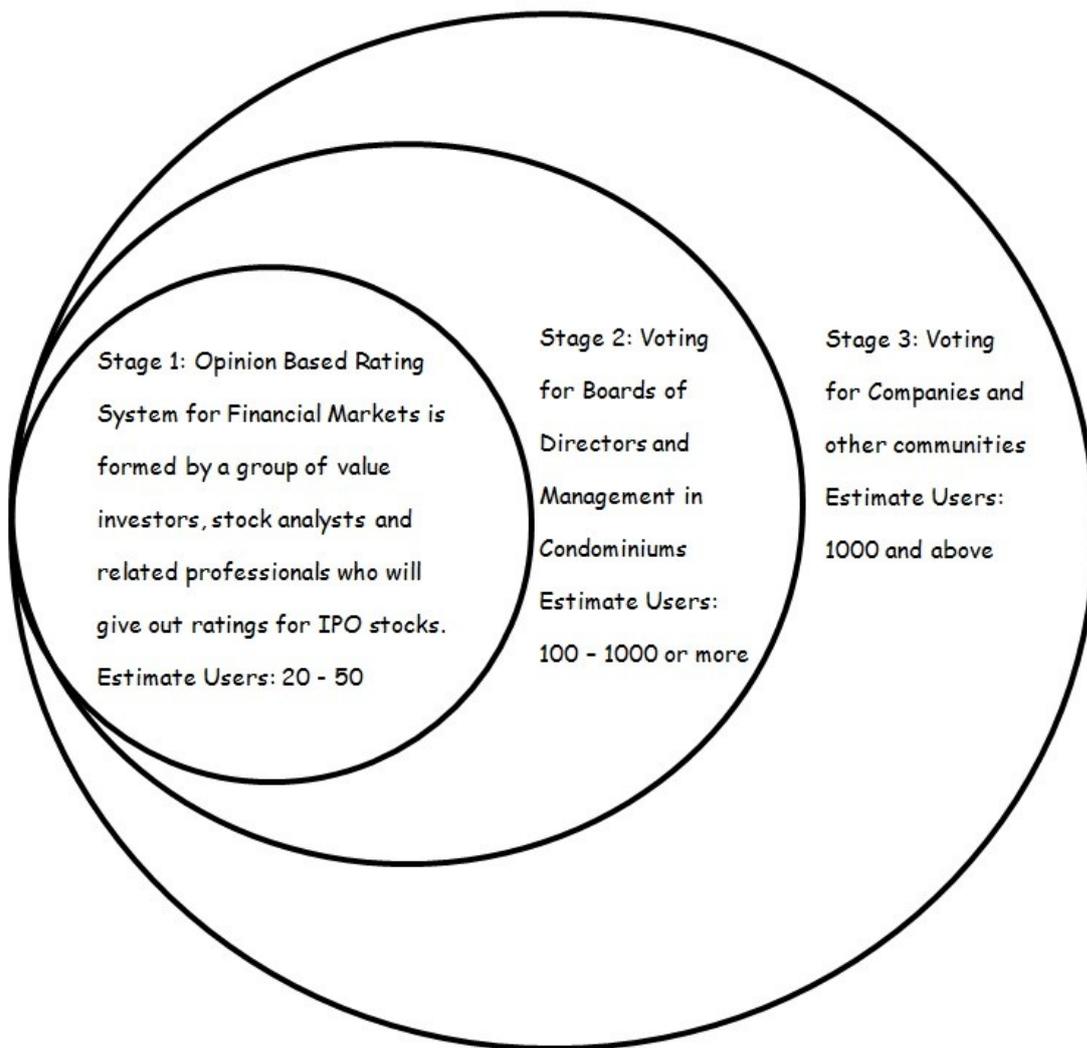
specifically applies to the financial market. The opinion based rating system is a group of value investors, stock analysts and related professionals who will give out ratings for IPO stocks. These specialists and experts will set rating parameters; based on these parameters, they will rate IPO stocks by voting on Volitium blockchain anonymously. The whole idea is to make the rating process transparent and credible. Hong Kong is our first testing ground.

This is like a civilian version credit rating agency which aims to democratise credit rating and to remove conflict of interest that are involved in the IPO process, especially because of compliance and regulatory requirements. For example, auditors provide audited financial reports for companies going public, while accepting fees from these companies. Investment bankers (ibankers) are paid by IPO companies to be underwriters (arranging buyers and pricing) while also being responsible for the company's due diligence. In Hong Kong, the stock exchange charges companies to list, while serving as a regulatory body with approval authority. IPO business also affects the stock price of the exchange, which is also a public company. Companies pay millions to be listed, yet the high cost is no guarantee. They can window dress financial statements and hide slim profit margins or unviable business models; once publicly listed, their unprofitable business model begins to surface, and profits can drop by as much as 70% to 90%.

We hope that by developing a rating system independent of the IPO process, and thus not influenced by conflict of interest. With a more transparent valuation process, public companies will need to be more accountable to retail investors. Hong Kong will be our first testing ground and as the rating system is proved viable, rating in other stocks and bonds will also be applied.

Ratings will be initiated by users through voting and putting stakes of Volitium which will then be used to remunerate people who participated in providing their viewpoints through voting on the Volitium blockchain.

5. Volitium Voting Platform Development Path

Stage 1: Opinion Based Rating System for Financial Markets is formed by a group of value investors, stock analysts and related professionals who will give out ratings for IPO stocks. Estimate Users: 20 - 50

Stage 2: Voting for Boards of Directors and Management in Condominiums Estimate Users: 100 - 1000 or more

Stage 3: Voting for Companies and other communities Estimate Users: 1000 and above

Volitium Voting Platform Development Path

6. Why do we need to raise funds?

There are a few technologies that we need to develop in order to get involved in rigorous voting, surveys and polls.

Requirements for Voting:

1) Voting must be free of charge
2) It must be user friendly and uncomplicated
3) It must be trustworthy
4) Voting identity must be true identity
5) It must be anonymous

Technology requirements:

1) Serverless instant messaging for individuals, companies, and institutions to download and set up their own private group for sending communications, surveys, polls, Volitium token 'Right' (see below 'What is Right')
2) Wallet to serve as ID
3) Backend: an independent blockchain
4) Standardised smart contracts to cater for surveys/voting/polls purposes
5) Customised smart contracts for other specific voting purposes

All these require human resources to develop software and hardware and a marketing team to promote the applications.

7. Technical Issues in Voting, Surveys and Polls

Differences between Bitcoin, Ethereum, and Volitium

Here is a simplified explanation of Bitcoin, Ethereum and Volitium:

1. Money: Bitcoin = Ledger   (Decentralize computer network)

Bitcoin functions as money. It is an open ledger recording transfer of value and text. Records are stored in the decentralized computer network.

2. Distributed Execution: Ethereum = Ledger + Processor (Ethereum Virtual Machine)

In addition to the function of being an open ledger recording value and text, Ethereum allows developers to write smart contracts to control value and text that automatically execute at a specific time or in a time frame. Various programs processed on the Ethereum system are DAPPs (Decentralized Applications). Together they operate as an Ethereum virtual machine.

3. Social consensus network: Volitium = Ledger + Voting Platform

Volitium is a ledger that records exchanges of questions and answers in surveys or ballots from voters to elected candidates, and preferences in polls. Records can be public or private, and disclosures of records (and degrees thereof) are controlled by smart contracts' requirements. Smart contracts are designed to meet the needs of users. A user friendly IM is designed to encourage various groups of users to reach consensus on the Volitium platform. The decentralized network provides security for all

recorded data .

Technical Treatments of Information Disclosure in Private Surveys and Public Polls

1. Information Disclosure Concerns

- The right to access the amount of information and the time to access that information may vary for private and public purposes.

- Participants are able to check to ensure their selection remains untampered with.

- Blockchain's transparency is unwanted when the voting process is underway as real time disclosure of voting results would create unfairness. Voters' choice at the time of voting should be protected.

- All results should be disclosed after the ballot, with the public able to check and count the number of votes from that time. This is only the mandate of public voting or surveys.

- Disclosure policy in voting in the private sector may be treated differently. Some voting in private companies should be kept private and not be seen by the public. For example, condo residents or shareholders of private companies electing boards of directors.

- Some companies may want private surveys to extract opinions to improve their products. They would not want other parties to know details of the survey questions or the results.

- That said, in some cases, private companies may want the public to see survey results in real time.

- As disclosure policies vary in private companies, smart contracts are tailor made case by case.

2. Network and Data Security

- Centralised data servers provide a single point of attack which is vulnerable to hacking. A Volitium platform powered by blockchain ensures data integrity. The record of the data is managed by a distributed network of computers which is resilient from attack and keeps data secure.

- Privacy and Security in Volitium are approached in three parts:
    1) Voting registration
    2) Identity Confirmation
    3) Ballot Secrecy

8. Volitium Competitive Edge

Volitium vs. Ordinary Website Voting/Survey Platform

Volitium Platform Operates on Serverless IM (instant messaging)	Ordinary Website Voting/Survey Platform
- Dissemination of data to multiple nodes	- login website server is centralised
- login and voting do not pass through any company server nor any website server	- Personal information is stored in the central server
- Smart contracts generate a 'Right' (Volitium token) which is similar to a ballot to a voter. No one, not even the set-up company, handles the distribution of the ballot. There is zero chance to tamper with voting.	- voting data is stored in central server

Volitium vs. Ethereum Voting DAPP

Volitium	Ethereum
- Serverless IM with wallet serves as smart ID - Mainly serves voting, surveys and polls. - People can raise funds for surveys, voting and polls. Tokens are created by standardised smart contracts. Donors or investors buy Volitium (volitium coin) to pay for the tokens. - There isn't much diversity in Volitium smart contracts. Volitium provides standardised smart contracts and customised smart contracts, which serve specific survey and voting purposes. Consultation fees will be charged for customised smart contracts.	- Various DAPP built on Ethereum, with online voting one of the most popular applications - people raise funds through Initial Coin Offering (ICO) or Security Token Offering (STO). ICO or STO tokens are created by pretty much standardised smart contracts. - There are great variations of smart contracts, as people are allowed to write smart contracts for their businesses using the Ethereum system. - In order to avoid smart contracts that produce infinite loops, users need to buy ether (Ethereum coin) to pay gas price

- Malicious attacks by infinite loop smart contracts will not be a concern.	for execution and verification of smart contracts.
- Focus simply on voting/surveys/polls. Volitium generates 'Right' (Volitium tokens) that does just what it entails on Volitium platform.	- A digital token in Ethereum can represent tradable digital assets, currency, reward points, gift certificates, etc.
- 'Right' should be free of charge.	- Ethereum tokens are tradable and therefore consist of market values in various degrees.
- 'Right' is non-tradable and non transferable. There will be expiry date as mandated by the deadline or closing of the surveys/voting/polls	
- Having control over setting transaction fees	
- Transaction fees are for the execution and verification of smart contracts.	

9. Why does a Public Chain Need to Connect to a Cryptocurrency?

Cryptocurrency was blockchain's first well known application. However, many governments try to separate blockchain technology from the currency function as currency represents the power of sovereignty. Blockchain does not necessarily relate to a currency, but paying the network of nodes globally with an underlying cryptocurrency will enhance its decentralisation. Therefore, blockchain and cryptocurrency are equally important and work in tandem.

Distributed networks of nodes are important for public blockchains. Storage and maintenance of blockchains are shared by distributed computer nodes around the globe so that records are secured and immutable. The more decentralised the network, the safer the blockchain. Duties of a node also include the verification of transactions stemming from a transfer of cryptocurrencies or an execution of smart contracts. There are requirements that the computational speed and storage of a computer must meet in order to perform those duties. These are operating costs in maintaining a distributed blockchain and they are absorbed by the network of nodes around the globe. This is why nodes should be remunerated for their work. A connection to cryptocurrency allows remunerations to be paid to nodes without hassles in exchange rate difference. Nodes operators in any corner of the world are able to exchange cryptocurrency into fiat money at the cryptocurrency exchange in their own countries. The ecosystem of the blockchain monitors the open source code. They initiate a change and amend the program together when they cite a bug or a problem. They use the same cryptocurrency as if sharing the same language. As the ecosystem expands, the value of the cryptocurrency will increase as it reflects a higher demand of the cryptocurrency. In view of cost efficiency and effective

management, it makes more sense for startups with little capital to engage in public blockchains rather than a centralised private blockchain.

10. How Cryptocurrencies Create Value

Blockchain creates economic value by streamlining processes, eliminating middlemen and recording things that are valuable. A public blockchain can unlock its value through its connection to a cryptocurrency. Let's study the two most successful cryptocurrencies, Bitcoin and Ethereum, as examples of how values are created by their blockchains.

Bitcoin	Ethereum
- First cryptocurrency - Allows peer to peer monetary transfer in a global context in around 10 minutes - Eliminates country borders - Eliminates limitation of banking hours and geographic time differences - Open ledger and tamper proof - Operates on distributed network - Eliminates clearing and settlement processes - Eliminates bank tellers - No minimum balance is required to open and maintain an account - As a result, Bitcoin has created social value by improving efficiency and reducing operational costs - People using Bitcoin to transfer funds create stable demand for Bitcoin - A cap supply of 21 million coin also supports Bitcoin value	- Allows peer to peer international monetary transfer in around 3 minutes - The use of smart contracts - a computer program that automates manual processes. - Startups sell tokens through ICO or STO to raise capital to kickstart their blockchain business - Distributed open ledger solves the problem of trust - Removes need for a physical equity exchange for raising funds - Allows small/medium and startup companies to get access to global investment funds without central authority - Expands through developers building DAPP on its platform - ICO, STO, execution and verification of smart contracts and building DAPP require purchases of ether, which are the stable demand in ether.

In conclusion, the elimination of middle processes created value. Their coin values are directly in connection with their usage as people found efficiency using them.

11. How Volitium Creates Value

Voting or surveys can take place on Facebook or some simple apps. Simple surveys or voting such as "how do I look today?" or "where do we want to hang out for the night" are always conducted among friends and only take a few minutes to reach consensus. No one would want to spend money to take these kinds of simple surveys. These are not valuable voting and surveys. There are operating costs in maintaining decentralized blockchain and nodes. Transaction fees are paid to the network of nodes for verification of records before multiple copies are disseminated across the network and become immutable. This mechanism automatically filtrates votings and surveys which collect opinions that are valuable. Records on blockchain are a proof of authorisation by majority through a trustworthy process. They represent power to affect the allocation of resources, which is where the value is. Value can also be created by cost cutting and improving quality and efficiency.

Pre-election surveys provide valuable information indicating electorates' preferences ahead of an election. Candidates usually revise their advertising strategies to get more votes. Surveys conducted on the Volitium voting platform allows respondents to take surveys in their free time, and receive rewards immediately after replying to the surveys. Survey results can be presented in real time. All these increase efficiency, and save time and costs. Survey response rates can be boosted. With blockchain's transparency, people can verify questions and answers of surveys, which will prevent rigged results. A survey reveals a result closest to the real situation and increases the predictability of an election outcome. Mega corporations and political parties pay millions of dollars to data analysis companies like Cambridge Analytics to observe voters' political tendencies and try to manipulate the outcome of the election. A reliable pre-election survey is valuable.

This also applies to electing boards of directors in a condominium or a company. The transparency of blockchain records will help to reduce chances of corruption. In addition, the use of proxies will be unnecessary, as people can vote anywhere and anytime within the time frame for the voting. As the convenience and efficiency in voting improve, residents and shareholders will likely be involved more in managing a condominium or a company. This in turn will improve the quality of management, which then saves money for residents and shareholders.

As mentioned at the beginning of this paper, we will kickstart the use of the Volitium platform by forming an Opinion Based Rating System which itself will generate value for Volitium. Consider this: people make money by having knowledge of market sentiment and expertise ratings; images that are closest to the truth or undisrupted information may help to reconcile antagonism or misunderstanding among communities, which are a social cost to a society.

In conclusion, users use the Volitium platform to extract opinions that give value. They may be opinions that help to improve the quality of products, services, or management in condominiums and companies. A better product would turn into monetary benefits for a company. An improvement in managing a property or a company may streamline costs. Eliminating middlemen not only reduces

costs, but also reduces the chances of corruption and redundancy. All these turn into a gain in value and thus are valuable opinions. In order to ensure real opinions, it is Volitium's mission to make ready tools that guarantee the truthfulness, secrecy, security and privacy of participants' identities and the choices made.

12. Technology

a) Server-less IM (Instant Messaging) Communication

Server-less IM offers peer to peer (P2P) communications. We can compare P2P communications to people passing a note. Say Paul wants to give a note saying 'I love you' to Mary. The note is folded (i.e. encrypted) and the people in the middle help to deliver it to Mary. In Volitium P2P communications, people in the middle act as POS nodes. A node in the network finds a route to connect to the nearest one and then the next one until eventually the message is delivered to the requested destination. Server-less IM is a solution accommodated by the coming 5G telecommunications. It is cost effective and most adaptable to populated big cities. By incorporating the serverless IM with a digital wallet, voters are able to cast ballots anonymously and securely.

b) What is 'Right'?

In the Volitium platform, our focus is solely on voting and responding to surveys and polls. Therefore, Volitium generates 'Right' which does just what it entails, i.e. to respond to a survey or participate in polls or ballots. The characteristics of a 'Right' include:

1) Fungible
2) Non-tradeable
3) Non-transferable
4) No transaction fee is charged in sending the token 'Right'
5) No transaction fee is charged in using the 'Right' to vote
6) A mandatory token - i.e. POS nodes have no option not to verify the transaction made by 'Right'
7) The 'Right' token expires when the ballot, survey, polling event ends.

c) Volitium Smart Contracts

Volitium smart contracts will handle confirmation of identities and all procedures associated with voting/surveys.

Unlike Ethereum smart contracts that allow people to write contracts that automatically execute procedures when some circumstances are met, Volitium smart contract codes are pre-set to support

the voting/survey applications. This would very much bypass the problem of infinite loop contract code that Ethereum needs to deal with (Ethereum resolved it by charging a punitive GAS price). As infinite loop contracts will not happen in Volitium, fees charged by Volitium to execute smart contracts can be contained and stable.

d) Development of Smart ID

Identification is the most important issue to resolve in order for online voting to be adopted officially and its results be taken seriously. The challenging part is how we can have hidden but genuine proof of identification online, without the involvement of central authorities? Bitcoin is used as internet currency while Ethereum acts as a virtual exchange where businesses raise capital beyond borders or a central authority. In both well known cryptocurrencies, public and private encrypted keys are created in pairs. The long code of the public key not only represents an account, but also a trustful identity, which produces open and untampered records on blockchain. The person who accesses this account with a private key represents its owner. He is the only one who can use the private key to make a transaction. A sender or receiver is represented by a long code on blockchain. Unless stolen or authorised by the owner, the one who uses the private key is the owner. On the Volitium platform, the development of an IM with a wallet would serve as a smart ID, which allows its owner to register and vote with a genuine identity, but he/she remains anonymous.

e) Random Proof of Stake (Random POS)

Proof of stake (POS) is a type of consensus algorithm that a cryptocurrency blockchain network uses to achieve distributed consensus. Participating nodes will have to hold a designated amount of cryptocurrency in order to be full nodes. An algorithm will authorise the creator of the next block via a combination of random selection and the amount or age of stakes one holds.

Volitium will be POS-based, and an algorithm will randomly choose stakeholders to validate transactions and create the next block. The random pick will be generated by an algorithm. The procedure of generating the random pick and its randomness will be transparent.

The Volitium blockchain prototype was tested by 86 registered members who are considered to be first backers. They helped in actively responding to economic survey questions, and answers were recorded on blockchain. Without them, we would not have gotten a head start. At that time, they were rewarded with gift points. When a Volitium coin is issued, their gift points will transfer to coins and they will have the choice of becoming stakeholders. The advantage of having existing members as stakeholders is that the Volitium system is readily supported by a distributed network, and the basic value of Volitium is ensured.

f) Combination Of Lightweight Nodes on Smart Phones & Full Nodes on Single Board Computer such as Raspberry Pi

-Lightweight Nodes on Mobile Devices

Lightweight nodes verify a transaction that has been included in a block. By connecting and transmitting transactions to the full nodes network, the work of lightweight nodes is only a fraction of full nodes. Full nodes will notify lightweight nodes if there is any problem with the transaction. A lightweight node needs only download the headers of all blocks on the blockchain, which means that download and storage requirements are significantly less intensive than for a full node. As telecommunications advances to 5G technology, the computation power and speed of smartphones will meet the requirement in running lightweight nodes.
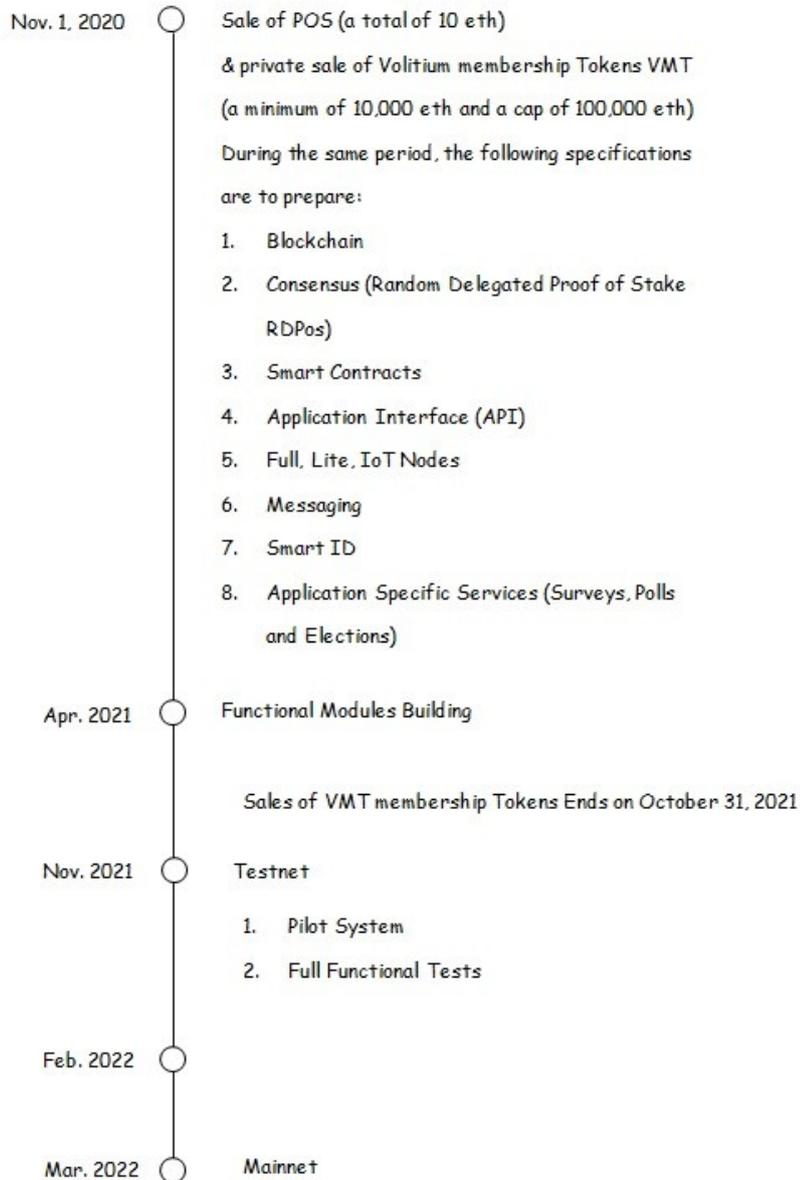
Nowadays, a System-on-Chip (Soc) processor in smartphones helps efficiency and speed.The Snapdragon series is one of the most widely used smartphone processors. The most recent model, Snapdragon 855, offers a clock speed of 2.84Ghz and has eight cores, which can solve up to 5 billion calculations in one second. The processor supports 5G technology. Mining by proof of work in Bitcoin demands competition to calculate a difficult mathematical problem and produce a lot of heat during the process. The heat emission from POW in addition to the heat from Soc would overheat a smartphone. However, Volitium operates on a POS distributed consensus network, so there will not be any heat concern. If simply dealing with calculations in verifying transactions, the processing power in smartphones is sufficient to carry out lightweight nodes duties.

-Full Nodes Operate by Single Board Computer (Raspberry Pi)

Stakeholders running full nodes on Volitium do not require the kind of computation that Bitcoin miners do in POW. As part of the calculation job in validating transactions is carried out by lightweight nodes in smartphones, Raspberry Pi as a node with the storage space of 4T is good enough for blockchain storage. Let's be reminded that as of September 2020 the size of the Bitcoin blockchain is approximately 297 gigabits. The cost of running a node using Raspberry pi is low and will invite more people to operate full nodes. It will enhance the dispersal of nodes and thus the Volitium blockchain is highly secured.

13. Technology Timeline

Roadmap

Nov. 1, 2020 — Sale of POS (a total of 10 eth)
& private sale of Volitium membership Tokens VMT
(a minimum of 10,000 eth and a cap of 100,000 eth)
During the same period, the following specifications
are to prepare:

1. Blockchain
2. Consensus (Random Delegated Proof of Stake
   RDPos)
3. Smart Contracts
4. Application Interface (API)
5. Full, Lite, IoT Nodes
6. Messaging
7. Smart ID
8. Application Specific Services (Surveys, Polls
   and Elections)

Apr. 2021 — Functional Modules Building

Sales of VMT membership Tokens Ends on October 31, 2021

Nov. 2021 — Testnet

1. Pilot System
2. Full Functional Tests

Feb. 2022

Mar. 2022 — Mainnet

14. Managed Issuance

As we all know, issuance in the crypto world is determined by the distributed consensus algorithm. Bitcoin issuance is determined by proof of work (POW) in which miners compete to be the first to solve difficult math problems in order to acquire a chance to create a new block. The difficulty of the math problem is adjusted so that the issuance of a new block is at an interval of 10 minutes. Ethereum consensus algorithm is about to move from proof of work (POW) to proof of stake (POS). However, at the time of writing this paper, the Ethereum issuance algorithm is still based on POW consensus, in

which a new block is issued at intervals of 10 to 12 seconds. The mining process of POW consumes lots of computer power and energy which is not environmentally friendly. In proof of stake, Ethereum protocol requires stakeholders to own a designated number of coins to become nodes and submit security deposits to participate in the consensus process. Despite the form of distributed consensus, the issuance of a crypto is controlled by algorithms.

Either by means of POW or POS to reach network consensus, incentives to miners or to stakeholders are in two forms: transaction fees for the confirmation of transactions and crypto coin rewards for the creation of a new block. Again, algorithms work out how miners and stakeholders are rewarded, and developers of different cryptocurrencies set out different plans (e.g. rewards for mining bitcoin were 50 bitcoins when it first launched and rewards are reduced by half every five years. Rewards for mining Ether is 3 eth.).

Volitium provides a platform for voting/survey/polls as well as a payment system to reward participants or carry out surveys/voting events. Execution of smart contracts and voting events on Volitium platform require Volitium coin. Smart contracts are customised to suit the requirements of various parties. These are the demands for Volitium. As Volitium issuance needs to make provision for scalability, supply should increase as demand scales. We need to avoid a limit on supply which would impede scalability.

On the other hand, unlimited supply would cause depreciation. As Volitium is using proof of stake as its network consensus algorithm, a mechanism to reinforce a rising trend in the long term would be in the interest of stakeholders.

In the real world, central bankers increase or reduce interest rates to affect market behaviour and impact the economy. In the crypto world, adjustments of transaction fees and/or rewards for new block creation can be used as tools to influence the behaviour of stakeholders and thus manage the circulating supply indirectly. This would provide support for the coin value. However, POS consensus will accelerate confirmation of transactions, as it does not require calculation. As a result, transaction fees in POS would be more stable than that of POW. This leaves adjustments of rewards in creating new blocks as our only option.

The decision process of whether rewards should be adjusted need to be open. There are benchmarks to be observed. Price is one thing that may signal market sentiment and/or condition of supply which may go up or down. Calculation of the velocity of exchange in the market or the turnover rate is another way to evaluate the supply condition. It can be calculated as follows:

Turnover rate = daily average transaction volume/Volitium circulating supply

Records of the turnover rate can be tracked on a daily basis. Together with the condition of pricing, the decision to adjust rewards will be voted among members of the Volitium foundation. As evaluation of the supply is market oriented and slightly trails demand, a managed appreciation in the long term can be maintained.

15. Calculation of Rate of Return for Retaining Stakes

as stakeholders

It should be noted that Volitium is using proof of stake as its consensus algorithm. There is no mining (as in Bitcoin) in Volitium. Stakeholders are chosen randomly to be the next block creator and earn the transaction fee. In other words, Volitium stakeholders only earn transaction fees. However, a stakeholder's incentive to hold on to a stake in the long run is its return on his/her stake. As mentioned above, the supply in Volitium is going to increase steadily and trail slightly to meet demand to allow a stable increasing value.

The return on a stake in Volitium includes transaction fees earned and dP, which is the price difference at time (t) and at time (0):

$$\text{fees} + (\Delta P_{(t-0)} / P_{(0)} - r_b) \cdot P_{(0)}$$

Calculation of the rate of return would be: $(\Delta P_{(t-0)} / P_{(0)})$. Its return also needs to beat inflation in general. As inflation fluctuates, a measure of yield in real terms would be a net of bond yields r_b of US Treasury Bills, which is considered to be a risk-free investment. This creates a perpetual return for holding Volitium stakes and verifying transactions.

16. Transaction Fees

Being a decentralised platform, there are computer nodes around the world in operation. They store, execute and validate smart contracts and blockchain transactions. To perform these duties, there are hardware requirements that an operating node must meet. They are costs to coin operators. Therefore, rewarding them is necessary, and rewards are in the form of transaction fees. However, when crypto prices surge, nodes tend to increase transaction fees to extract priorities. It is important to maintain the stability of transaction fees, as our priority is set for undisturbed voting, polls and surveys that take place on the Volitium platform. So, how are we going to accomplish this?

In our model, voting is free of charge so that voters can vote without worry. However, Volitium will be using POS as our consensus algorithm for validation of transactions and execution of smart contracts. Raspberry pi will be all that is required to perform the duties of POS in Volitium. Running full nodes on Raspberry Pi is low and transactions fees will be predefined. When prices surge, stakeholders will be encouraged to increase the number of nodes to capture more transaction fees. Random selection safeguards the difficulties of guessing the next block creator so that the security of the blockchain will not be compromised. Moreover, the distributed consensus process in POS will be much quicker than POW, which requires competition in solving computation-intensive puzzles. These features may very much stabilize transaction fees in Volitium and the operation of the Volitium platform will not be disturbed.

17. Fundraising Volitium Tokens (VMT)

At the fundraising stage, Volitium membership tokens (VMT) which are ERC 20 of Ethereum will be available for sale from November 1, 2020 to October 31, 2021. We only accept eth. Our target is to raise a minimum of 10,000 eth and a cap of 100,000 eth at the rate of 1 eth to 100 VMT.   Fundraising period may end early whenever our target is met. Funds would be directed to create independent blockchain, peer to peer instant messaging communications and to develop the above mentioned technology in this white paper that is required for voting.

Those with Volitium membership tokens (VMT) will be considered as first backers and will assist in testing our beta product for free. Members can also become volitium POS stakeholders by accumulating 10 eth or 1000 VMT. Then POS stakeholders will be able to download node programs on their own devices and they will be able to operate nodes to profit from transaction fees from validating crypto transactions and smart contracts. We will provide nodes specifications when blockchain testnet is available.

When Volitiums mainnet is launched, VMT will be transferred to crypto coin and will be tradable / in cryptocurrency exchanges.

18. Discussion of Reforming Democracy

As a founder of a voting blockchain, I cannot deny having an ambition to see reform to the democratic process. As the Volitium blockchain solves the problems of authenticity, security, privacy, and secrecy in online balloting, and people can vote conveniently on all issues on electronic devices, it should be time to think of a change in democratic systems in order to make a better world.

What urged me to develop a voting platform that could change democracy was the polarisation and conflicts that representative democracy has created all over the world nowadays. Conflicts are often inflamed during an election. As a result, antagonism rose between different races, the young and the old, the rich and the poor. Polarisation in society became so severe that families and friends were divided. Individuals suffering from mental illness may feel particularly stressful, which may even lead to suicide attempts or murder of people with opposiing political views. In the midst of heated debate over the Brexit referendum, on 16 June 2016, Jo Cox, the British Labour Party Member of Parliament for Batley and Spen, died after being shot and stabbed multiple times in Birstall, West Yorkshire. The murderer, Thomas Mair, a 52-year-old unemployed gardener was found to have mental health problems. He saw Cox as a traitor to white people because she defended immigrants and the European Union. In Charlottesville, Virginia on August 12, 2017, when alt-right and white nationalists demonstrated against counter-protestors, a car plowed into the crowd, killing a 35 year old woman and injuring more than 19 others. There are many more examples from around the world.

Election campaigns stir polarisation. Mainstream media and social media bombard citizens with emotional messages. Some people even have voting stress, which relapses when elections are held

every four to five years. Furthermore, hosting election campaigns are costly which then barricade ordinary citizens without wealthy background or party support from competing in an election. The process could invite corruption.

Nowadays, most of the western world practices representative democracy, which is indirect. Under this system, officials are elected to represent a group of people. Representatives debate and vote on laws and policies on behalf of their voters. However, humans may easily succumb to herd behaviour or short-term passion and make possibly unwise choices.

Moreover, government policies are short-sighted or lose continuity as administrations are replaced. Sometimes one administration will reverse its predecessor's policies in ways that harm the economy and social well-being. More often, politicians canvass votes by offering political sweeteners, which in the long term can lead to uncontrollable fiscal debts.

Politicians in a representative democracy are in some ways proxies. However, they do not necessarily act in accordance with the interests of the people in all issues. People can only vote the representatives out of office in the next election, which may be several years away.

Blockchain missions can eliminate middlemen and any form of proxies. As blockchain resolves the problem of trust and voting can be done by fingertip on an app, it is possible for everyone in the society to participate directly in deciding public issues.

Yes, I am proposing direct democracy, which allows people to vote directly on public issues rather than on electing people. It is the original form of democracy and true democracy. The drawback of direct democracy in ancient times was that too many people debated in a designated time and place, with voices overlapping each other. Reaching consensus was a painstaking process. Nowadays, consensus can be reached conveniently through voting on smartphones. When decision making is in the hands of citizens, an executive need only execute the decisions of citizens and could even be chosen randomly among all adult citizens who have fair education and capabilities. Terms of office can be strictly limited. As the connections between those in power and narrow interests is broken, the chances of corruption could be minimised. Other forms of hidden influence would also be greatly weakened. In all, direct democracy, I think, would best serve people's interests nowadays.

In modern society, Switzerland is a rare example of a western country practicing direct democracy (at the levels of the municipalities, cantons, and federal state). However, it is a modified form of direct democracy under which any law enacted by the nation's elected legislative branch can be vetoed by a vote of the general public. Nonetheless, when the technology is ready, it should be time to initiate a discussion of a modern form of direct democracy.

The elimination of middlemen was a key feature of cryptocurrencies. Bitcoin led the first revolution in currency. Its transparent transaction records and anonymity of exchange parties eliminated the role of banks and the process of clearance settlement. The second revolution by Ethereum was in the financial market. The transparency of Ethereum blockchain developed trust and thus allowed the development of an international capital market in the virtual world. It eliminates hefty middlemen charges by stock exchanges, accountants and investment bankers. Volitium calls for the elimination of middlemen and all forms of proxies in ballots. It will ultimately inspire the third breakthrough, which is in social development.

19. Founder's Information

Volitium Founder and CEO, Ng Chin Yeung, is an independent investor and Hong Kong-based financial content blogger with the pen name 亂博（luan-invest）@ http://luan-invest.blogspot.com/ recording viewpoints in stock market, international interest rate trend and international economics since 2011. From 2013, she started to write analysis on Bitcoin and blockchain, and has become a cryptocurrency investor.

Works In Explaining and Promoting Bitcoin, Ethereum and Blockchain Technology :

Books Published:

1)　貨幣革命—加密貨幣新時代（Translation: Currency Revolution —— The New Era of Cryptocurrencies）published in July 2016 by Literate Publication Limited. ISBN 978-988-1-4007-7-2

Hard Copies available for sale: https://bookhunting.shoplineapp.com/products/

2)　財富潛藏區塊鏈金融革命 2.0（Translation: Treasure Underlying Blockchain led Financial Revolution 2.0）published in June 2018 by Enlighten & Fish Ltd. ISBN 978-988-8481-59-0
Hard Copies available for sale: https://www.signer.com.hk/product/財富潛藏區塊鏈金融革命 2-0/

Youtube Link at a popular Youtuber Channel in Hong Kong, with focus on topics regarding stock market, stocks valuation, and financial freedom

– 區塊鏈獲利竅門 (1) [English Translation: Ways to Profit from Blockchain (series 1)] –
https://youtu.be/d1DUO_fq22Q

– 區塊鏈獲利竅門 (2) [English Translation: Ways to Profit from Blockchain (series 2)] –
https://youtu.be/m1e4oONQMyw

– 區塊鏈獲利竅門 (3) [English Translation: Ways to Profit from Blockchain (series 3)] –
https://youtu.be/e2jn58RSGrQ

20. Important Links

Private Sale VMT & White Paper: https://volitium.io/

Volitium survey platform: https://volitium.com/

Volitium facebook: https://www.facebook.com/volitium/

Founder's Blog: http://luan-invest.blogspot.com/

Founder's Fan Page: https://www.facebook.com/luaninvestblog/