Mobile Data Chain

Blockchain integration of mobile streaming data

White Paper V1.0

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Contents

1.0   Executive Summary

In 2008, after Satoshi Nakamoto introduced his article - Bitcoin: A Peer-to-Peer Electronic Cash
Systemi, Blockchain technology and cryptocurrency have attracted worldwide attention. Since the first

block was founded until now, there have been three important stages in the development of blockchain technology.

1. In 2009-2013, the pioneer cryptocurrency, Bitcoin, became one of the most successful application of blockchain technology. It created an ideal vision for people – a global currency. What followed was "One Chain One Coin," means one cryptocurrency is created with one particular chain.
2. In 2013-2014, the use of blockchain technology was applied in financial sectors, including the current blockchain industry standards that Wall Street banks want to build to improve the efficiency of bank settlement payments and reduce the cost of cross-border payments. In addition, the exchange actively tries to use Blockchain technology to realize several functions such as stock registration and transfer.
3. From 2015 until now, it is the era of programmable blockchain (smart contracts). Not only the application of blockchain has extended beyond other areas of finance, it covers many aspects of human social life that enable human being no longer rely on a third person or institution to gain trust or establish credit. Ultimately, it achieves information sharing which is applicable in legal system, medical care and logistics. Blockchain technology can solve the problem of trust and improve the operating efficiency of the entire system.

From these three stages of evolution, we can conclude that blockchain technology has made a great progress from a single, simple function to a complex diversity. As for now we are in the third stage of rapid progressive development.

However, most of the current blockchain application are still based on the most primitive cryptocurrency features such as data storage, peer-to-peer transmission, consensus mechanisms, and encryption algorithms. These are all required to have computers or servers with strong computing power. Instead, the application of blockchain is far more than this.

Jay Samit, the Independent Vice Chairman of Deloitte, which is one of the four largest accounting firms in the world, used to work for a number of major entertainment media companies including EMI and Sony, an is much involved in new media and digital media. Recently, he published an article, with a prediction of the trend of science and technology in 2018, in Fortune Chinese website. In this article, he mentioned: "The breakthrough innovation relies on the existing mobile device infrastructure. And he also mentioned that the most popular trend is the Blockchain Internet of Things (BIoT), a combination of Internet of Things (IoT) and blockchain technology. The Internet of Things refers to the installation of chips and sensors on different devices so that these physical devices can be connected into a network. Jay believes that BIoT can ensure companies and consumers not to worry about the valuable data in their blockchain being stolen by hackers.

The value of the data is inevitably important. "The Economist" (3) has pointed out long ago that data is the oil in digital age, and it is the most valuable asset in the current information age. All big giants like Facebook and Google have realized the value of data and made it into their strategic asset. In addition, with the increasing number of data collection and analysis companies, this truly justifies that many service providers are aware of the enormous benefits that data can bring. However, more and more people are realized that your information has been expropriated for free. The era of big data is not only bringing convenience to people, but it also increases the risk of information leakage. The leakage of personal information may lead to harassment of spam messages or fraudulent telephone calls. In worse case, it may even expose you to the risk of property and personal safety. Unauthorized and unregulated sales of information have transformed to an unfaithful business that threatens our daily life.

Although the awareness of the protection of personal information data is growing, many people still do not fully understand different types of data. People tend to ignore some data flow featured with sequential, massive, fast, and continuous nature. While we play with various APPs to produce various kinds of content data, the devices are also constantly generating streaming data. However, the volume and contained information of its data are not valued and have not been fully utilized.

Mobile Data Chain (MDC) is an application of blockchain's smart contract for mobile streaming data. Users can securely upload their mobile streaming data, such as geographical location, health data, and log data, to the centralized blockchain in real time through smart contracts. The data is securely stored and the user is rewarded accordingly by proof of work and Token mechanism. Nowadays, blockchain technology is widely used to process various digital assets. As a digital asset, data is linked through MDC and blockchain technology, which is also arguably the most essential to blockchain technology application.

At the same time, we believe that blockchain technology would become more popular. Even today, the technology applications of various blockchains keep expanding. The technology itself has made considerable progress and development. It has been reflected in many application scenarios, and it has also cultivated many decentralized applications (DAPP). However, when we talk about blockchain technology, most people think of ledger, consensus mechanisms, and Bitcoin, and these seem to be far away from the general public. Many media and institutions, which researched blockchain technology, have pointed out that people are getting confused by it, especially for those who are just beginning to understand blockchain technology and cryptocurrency. The terminology, complicated operations, the concepts and products which seem to drift away from our daily life. Now cryptocurrency and digital products have only attracted the attention of a few people and not penetrated into the general consumers.

Therefore, MDC not only focuses on data processing, but also spend our effect on devices that are closely related to people's daily life. We will start with mobile phones and gradually build blockchain integration of IoT device stream data.

We have done in-depth research that the usage of mobile phones is gradually increasing globally. The number of registered mobile phones in Japan has exceeded 100 million by the end of 2017 (5). People spend an average of about 2 hours a day and this number is still growing and gradually replaces the time people use other devices to browse other media (6). If these mobile device resources are integrated, the streaming data can be made use of to form a distributed mobile streaming data network. Thus, this become an important element for the infrastructure construction and development of MDC.

MDC, as a pioneer in this area, utilizes the features of wide coverage and ease of using mobile devices, realizes the potential security risks and potential value of streaming data, and allows anyone to upload data from their own mobile devices. The terminal can be any device that not limited to mobile phones, smart home, and the Internet of Things that effectively bring people closer to the blockchain technology.

MDC can be applied to many scenarios in daily life such as scientific research (medical treatment, geographic data analysis), artificial intelligence, market analysis, and financial products. The establishment of MDC is based on the concept of blockchain that explicitly point to the data security by breaking the traditional data collection and analysis service model to establish a brand-new mobile end blockchain ecosystem.

MDC is aiming to become the pioneer of blockchain application which is based on mobile streaming data.

2.0 Definition

2.1 Streaming data

Streaming data is a set of sequential, massive, fast, and progressive sequences that are usually sent via data record. It is small in size (a few kilobytes) and used in network monitoring, sensor networks, aerospace, meteorological measurement and financial services.

In our daily life, streaming data is not limited to that mobile or web applications used for online shopping, gaming, social networking, financial trading platform, geospatial services and even all those devices and equipment in large data center.

There are four characteristics in streaming data:
1. Real-time arrival of data
2. The arrival order of data is independent and is not controlled by the application system;
3. The data scale is massive and its maximum value cannot be predicted;
4. Once the data is processed, it cannot be taken out again unless it is deliberately saved or relatively high cost incurred.

A large percentage of data collected in our daily life can actually be categorized as streaming data and it is the most basic data source for big data analysis and has been widely applied to various daily life scenarios.

2.2 Mobile device

We are familiar with mobile devices such as mobile phones, smart watches and bracelets, smart homes, and so on. Many people also like to call mobile devices as mobile Internet terminals. People have clearly recognized that devices like mobile phones are not just a communication tool, but also a small mobile smart computer. Mobile device equipped with strong processing capability, memory, storage media, and operating system can be considered as a small computer system that can complete complex processing tasks, and achieve dialing, photo shooting,listening music, playing video games, GPS positioning, information processing, etc. It definitely can adapt in various fields and become an important and vital part of our daily life.

2.3 Internet of Things (IoT)

IoT is the the interconnection via the Internet of computing devices embedded in everyday objects, enabling them to send and receive data. The devices being connected can reach 1,000

to 5,000 around one person and with the development of the Internet of Things, this internet will include 500 to 1 trillion objects (8). This includes all devices we are familiar with such as mobile phones, tablets, smart cars, smart refrigerators, smart headphones, smart wearable devices, etc. In the IoT, everyone can connect their devices to the Internet, and manage and control those devices via IoT to form a network of person-to-person, person-to-object and object-to-object (9).

The IoT has a wide range of applications. One of the advantages of IoT is its ability to integrate digital information of objects and objects without being affected by physical distances. This can be applied in transportation and logistics, health care, smart environment (home, office, factory), personal and social use as well. Therefore, undoubtedly, IoT has a very massive and broad market. At the same time, by gathering these scattered data and consolidating it into big data, it can make changes that can affect and contribute society in urban renewal, disaster prediction, crime prevention, and epidemic control.
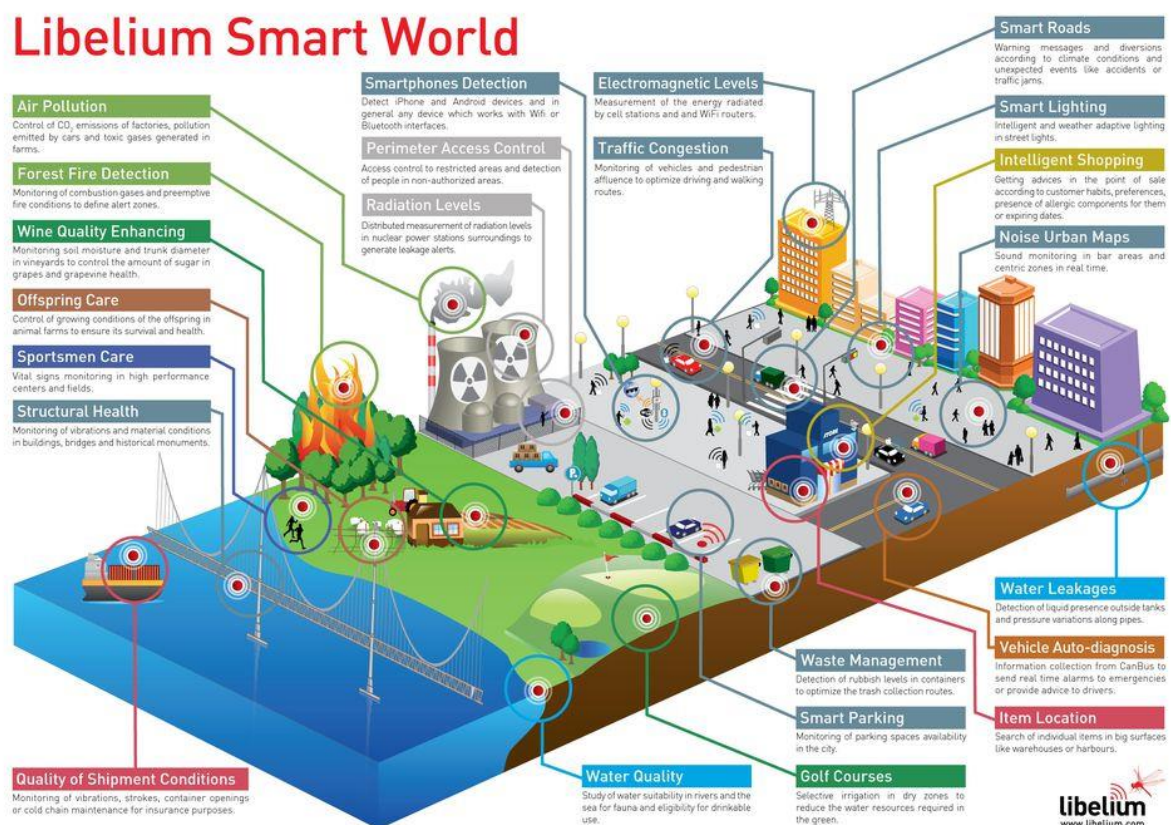
2.4 Proof of Work

Proof of work (PoW) basically is an evidence which can justify how much you had done. This is a highly efficient and effective means to provide trust across different parties.

For example, PoW are used in Bitcoin for block generation. The hash of the block contains a run of leading zeros and the number of zero required is set by the difficulty. When mining bitcoin, the hashcash algorithm repeatedly hashes the block header while incrementing the counter & extraNonce fields. And this process require a certain amount computing resource. Bitcoin stores the nonce in the extraNonce field which is part of the coin base transaction that this node provide the PoW and reward is gave in this process.

Similarly, other cryptocurrency has its own type of PoW and is released via smart contract on the coin exchange market. Like ETH coin, the co-founder, Vitalik Buterin created Proof of Stake (PoS) that varies in that a person can "mine" depending on how many coins they hold.

We will also introduce the original Proof of Streaming Data (PoSD) consensus mechanism for MDC in Chapter 4.6.1 below.

2.5 Mobile Data Token（MDT）

Mobile Data Token is the blockchain cryptocurrency used for value exchange, such as rewarding data contributors, purchasing MDC's related products in MDC. This will be covered in more detail in chapter 4.6 of this white paper.

3.0 MDT's Target

3.1 Current market analysis

3.1.1 Japanese mobile phone and mobile device scale

Japanese mobile phone culture plays an important part of today's Japan society. Most Japanese have smart phones and the most common communication method is via mobile phone APP due to the rapid development of smart phones.

According to the survey data (5) in 2017, the number of existing mobile phone users in Japan has exceeded 100 million. It is not difficult for us to see that this figure will also continue to rise steadily.

Number of mobile phone users in Japan from 2013 to 2020 (in millions)

Year	Number of mobile phone users in millions
2013	103.8
2014	104.9
2015	106
2016*	106.4
2017*	106.8
2018*	107.1
2019*	107.2
2020*	107.1

Sources
eMarketer; AP
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Additional Information:
Japan; eMarketer; 2013 to 2015

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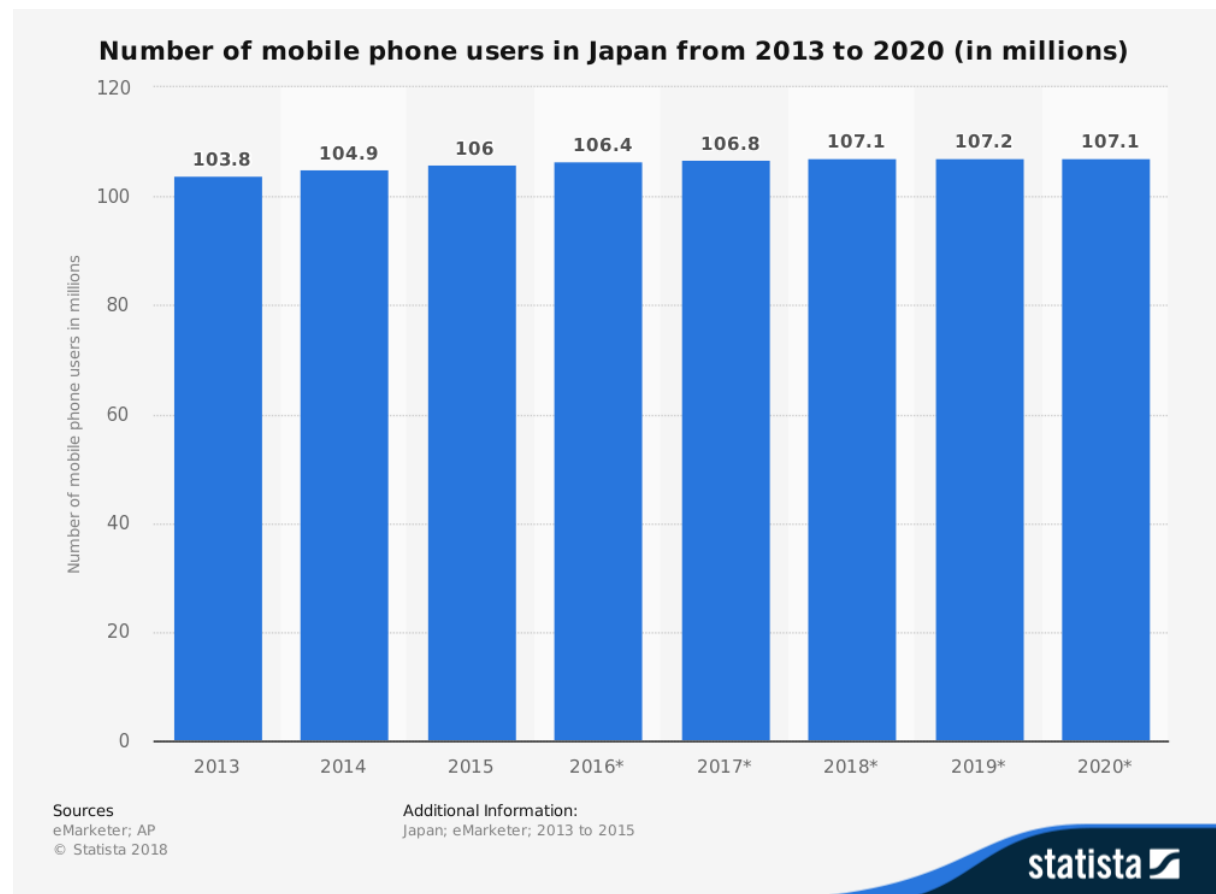
In addition, according to the survey, the popularity rate of smart phone in Japan has just reached 60% (13). It is not hard to imagine that the popularity of smart phones will continue to rise in the near future. With the sharp increase in popularity rate of smart phone, the number of mobile phone will far exceed the estimated 100 million units in the market.

Currently, people are not only connects to the Internet through mobile phones. By looking at the IoT device market in Japan, we can see that the number of devices connected to the IoT has reached more than 700 million units (14) in 2017. This number will also grow steadily in the future.

Installed base of the Internet of Things in Japan from 2013 to 2020 (in million units)

Year	Installed base in millions
2013	497
2014	557
2015	624
2016*	698
2017*	777
2018*	861
2019*	956
2020*	1 057

Source
IDC
© Statista 2018

Additional Information:
Japan; IDC; 2013 to 2015

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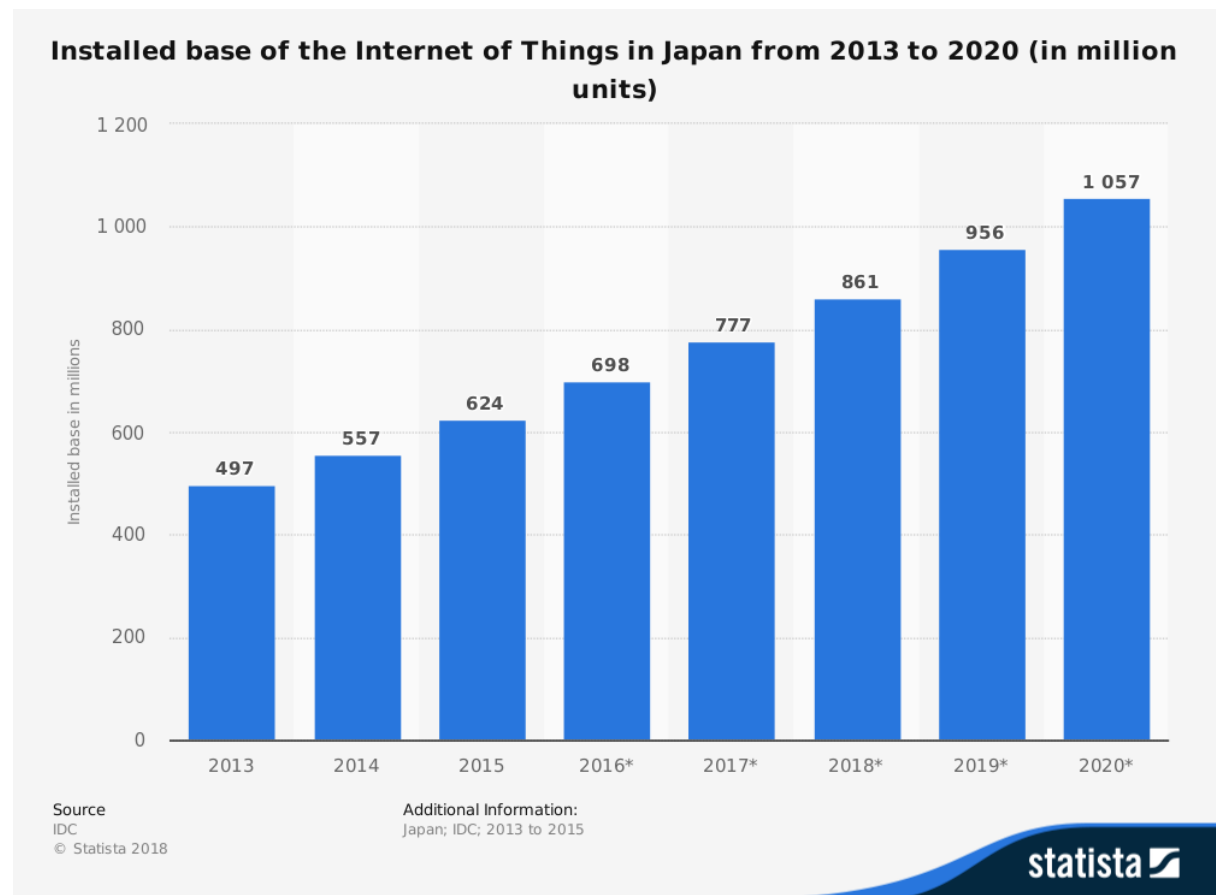
3.1.2 Global Mobile Device Development Scale

As we mentioned, mobile device is not only limited to mobile phones, but also includes other devices such as tablets, car computers, smart home, etc. With the increasing popularity of the IoT, the number of smart mobile devices that can manage complicated function is also increasing.

A report from the CompTIA pointed out (15) that IoT is growing rapidly and it is predicted that devices connected to the IoT will reach 50 billion units by 2020 that provides a further productive push to IoT.
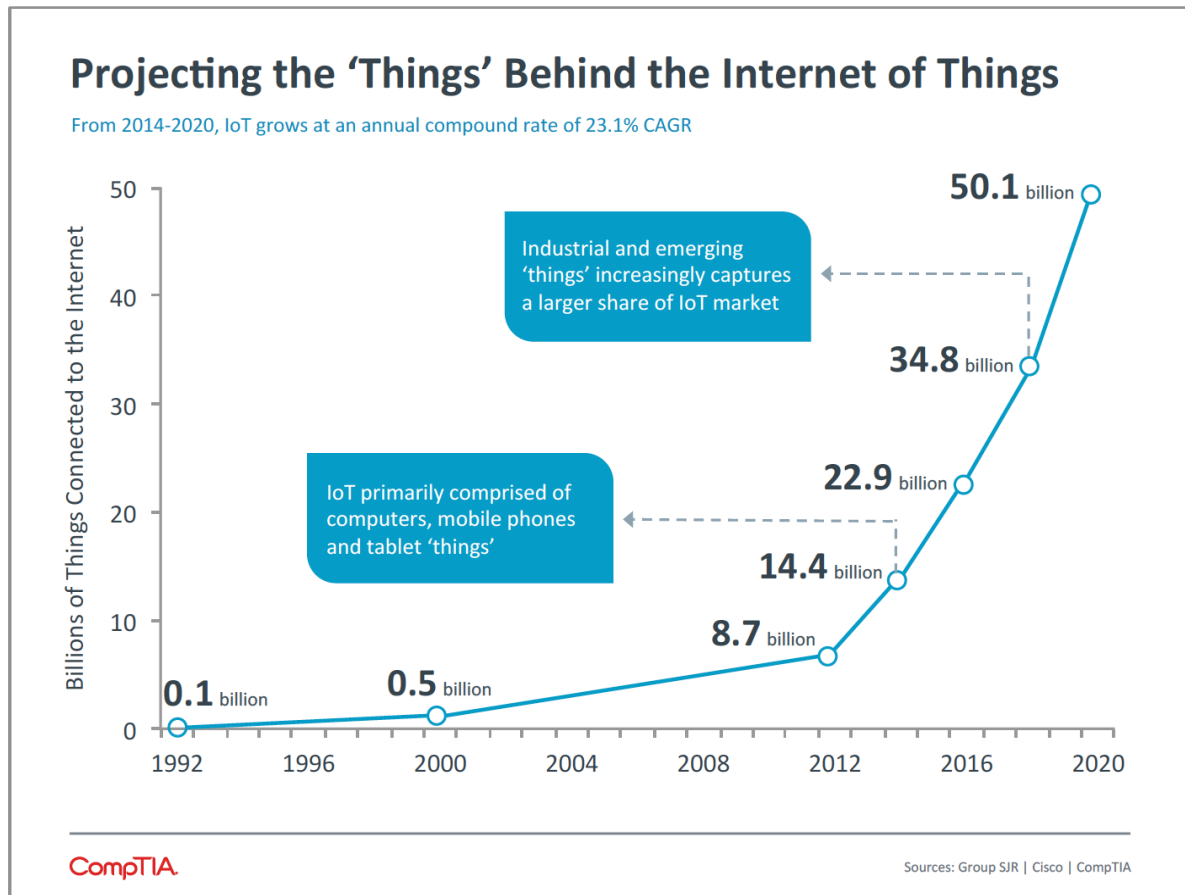
Ericsson also predicts that the number of global smartphone users will double up, from about 3.4 billion today to 6.3 billion (16) by 2021, which literally means most of adults on earth will use some form of connection with particular devices.

At the same time, with the development of smart homes, the average number of mobile devices owned by each family will continue to increase. Therefore, we predict that there will be a geometric growth in mobile devices using our service in the future, and this market will continue to grow with substantial value.

3.1.3 The Usage analysis of Mobile Device

In 2015, the use of mobile device has exceeded computers (17). Although different survey may use various approaches or methodologies, overall comprehensive data shows that the average daily usage time of Japanese mobile phone users exceeds 2 hours. Especially, for young people in Japan, the average number of mobile phones per person per day is more than 4 hours (18).

Leading smartphone and tablet activities 2017, by device

Most popular mobile internet activities according to internet users worldwide as of 1st half 2017, by device
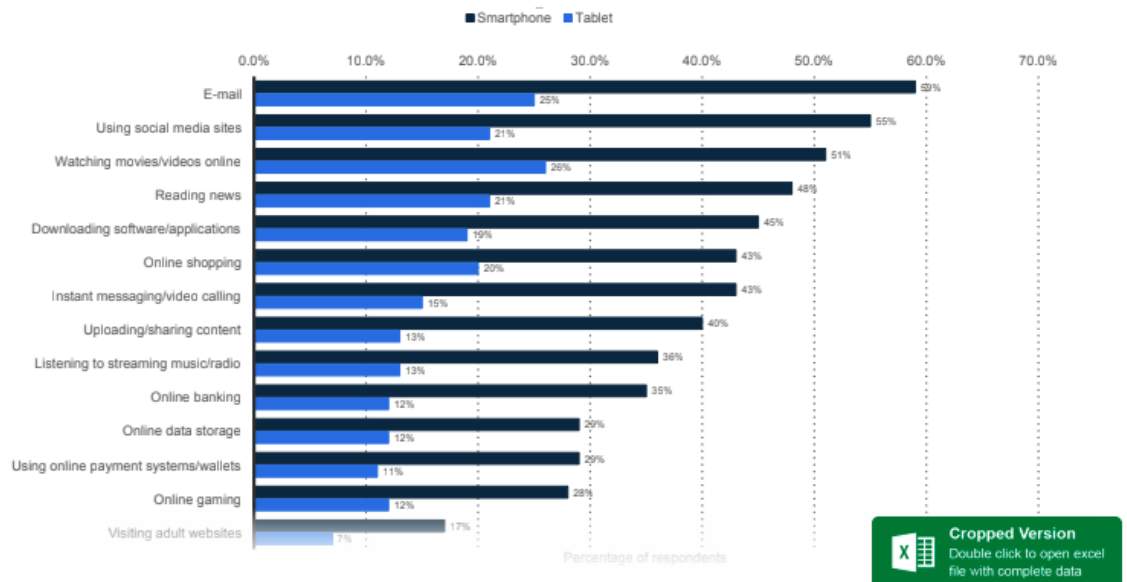
Moreover, the data obtained through the survey (19) shows that the types of online activities of mobile phone users are very diverse that from checking emails, downloading apps, to online shopping and data storage covering all daily life activities. This also shows that users use mobile phones on a daily basis and are constantly producing various types of data.

3.1.4 The Market Analysis of Mobile Data

Given the high usage of mobile devices in terms of volume and time, the amount of data generated from it is genuinely massive. In 2018, global mobile data will reach 17 exabytes per month and will rapidly increase to 49 exabytes in 2021 (19). Therefore, we can derive that the mobile phone market in Japan generates about 150GB of data per second. In other words, the daily data generated by Japanese users can reach astonishingly 13,000 TB. The volume of data on the mobile devices is so significant that even if we assume 1GB of data worth 1 RMB, the annual transaction volume in this market will easily increase beyond 100 million.

Although it is hard to determine the specific value of the data, the importance and high value of the data is beyond any doubt. A study at the University of North Carolina, United States, clearly shows that our mobile data is far more than 1GB/RMB no matter it is user active auction data or corporate purchase data (20).

MONETIZING PERSONAL INFORMATION

WHAT IS YOUR DATA WORTH TO YOU?

$2.72 (or €2)

An Italian university found that study participants would auction off their smartphone activity data for a median bid across all data categories of $2.72 (or €2).[6]

$8

Datacoup pays customers $8 per month to access their social media accounts and view a feed of transactions from credit and debit cards.[7]

$100

Luth Research's "ZQ Intelligence" service tracks smartphone, tablet or PC activity in exchange for a payment of $100 a month to 25,000 opted-in users.[8]

$480 (or £288)

Dutch student Shawn Buckles auctioned off his private data—including browsing data and email conversations—to The Next Web for a lump sum of £288.[9]

$2733

Federico Zannier sold his data (including keystrokes, mouse movements and activity screenshots) for $2 per day on Kickstarter, ultimately netting $2,733.[10]

However, mobile streaming data and machine generated data have not received the attention they deserve in the current market. Machine generated data is a digital information created by computers, mobile phones, embedded systems and other networking devices. With the advancement of technologies such as radio frequency identification (RFID) and telematics, these data have become more common. Recently with the enhancement of IoT, use of Hadoop and other big data management technologies, mobile streaming data has become

more and more distinct and pronounced. Thus, the value of mobile streaming data is more explicit.

Therefore, we can conclude that the value of mobile streaming data is vast and titanic. We have reasons to believe that this is a trillion-level market.
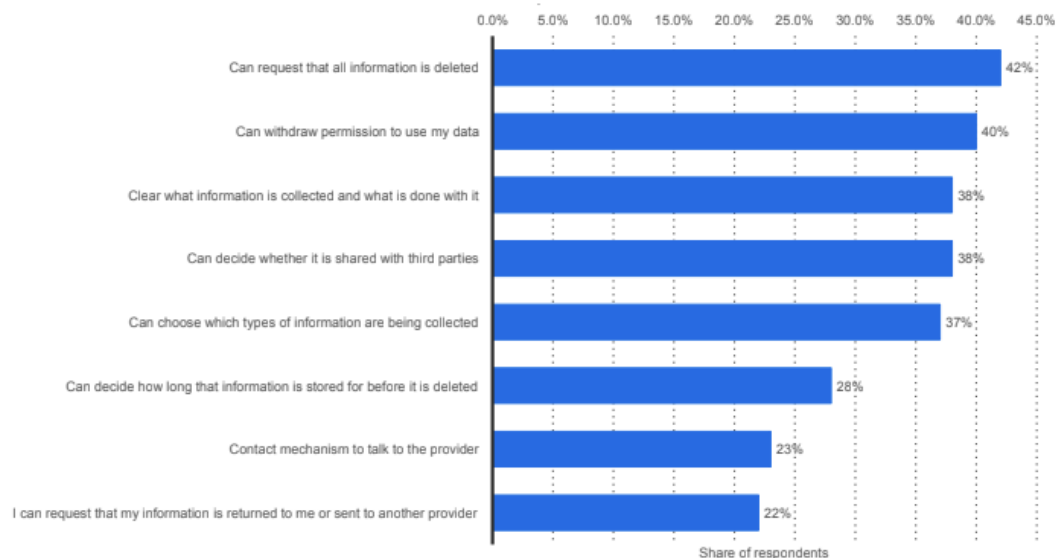
3.1.5 Data collection and processing condition

We also noticed that people are paying more and more attention to data security. According to surveys, people are very concerned about data security issues when using mobile phone APPs and services. Among them, several aspects which people are highly concerned about include whether the data can be deleted or they can reclaim the right to use their own data, what nature of data are collected, how it to be used and so on.

Mobile activities   40

Global smartphone user trust in data use of mobile apps and services 2017

Most important attributes that smartphone users worldwide find vital in building trust in mobile app and service use of data as of July 2017

Attribute	Share of respondents
Can request that all information is deleted	42%
Can withdraw permission to use my data	40%
Clear what information is collected and what is done with it	38%
Can decide whether it is shared with third parties	38%
Can choose which types of information are being collected	37%
Can decide how long that information is stored for before it is deleted	28%
Contact mechanism to talk to the provider	23%
I can request that my information is returned to me or sent to another provider	22%

It is not surprising that people are particularly concerned about these issues. In recent years, the problem of data security issues have emerged one after another. When you open the smart phone app, do you receive such prompts: "Allow xxx to get your location information" "Allow xxx to get your contact information". This information is collected via different channels,

and we, as the data producers and owners, most likely have no idea how our data is stored, used, or even traded.

And now, the problem of data leakage is getting worse. A few days ago, a survey conducted by China Youth Daily Social Survey Center's joint questionnaire network with 2006 respondents showed that 79.0% of respondents felt that personal information was leaked (21). According to the "China Internet Rights Protection Survey Report (2015)" published by the China Internet Society 12321 Network Disadvantaged and Spam Reporting and Handling Center, the total losses caused by the leakage of personal information, spam, and fraud information by Internet users in 2015 is 80.5 billion yuan, about 124 yuan per head (22).

This is not only happening in China, but also impacting us on a global scale. In 2015, Comcast Telecom of the United States leaked 75,000 users data, and these users had already paid for the protection of their data. Data leakage in the health care field is severe as well. Many companies are also aware of the high value of data. There are now more than 270 large-scale data service providers (23) in the world and have already made profit of over 100 million yuan. However, as a data contributor, we barely know what data is collected and how it is used. In the absence of rewards, we also bear the risk of data security problems. The data breaches of Facebook, which was recently revealed to affect US elections, is an excellent example of data services being misused and users' interests not being guaranteed.

Data security issues not only affect personal data, but also impact the streaming data directly generated by the computers and devices. Since people would pay more attention to data generated by them, which is related to their personal information, they would tend to ignore the mobile streaming data generated by their own mobile devices. All in all, the data security problem should be focused to solve. IoT data also faces the same problem as well. According to a report by Samsung (24), data security and privacy protection have become the most pressing issues in IoT.

In Japan, the cost spent on IoT security has reached 700 million U.S. dollars in 2017 (25). The security issues involve all aspects of equipment, communication, cloud and management. This further proves that there are many data security problems in the IoT market and the potential market is huge and solid.

3.1.6 The Market Analysis of IoT

After analyzing the number of mobile devices, data volume, and data value, let us make an analysis on IoT market.
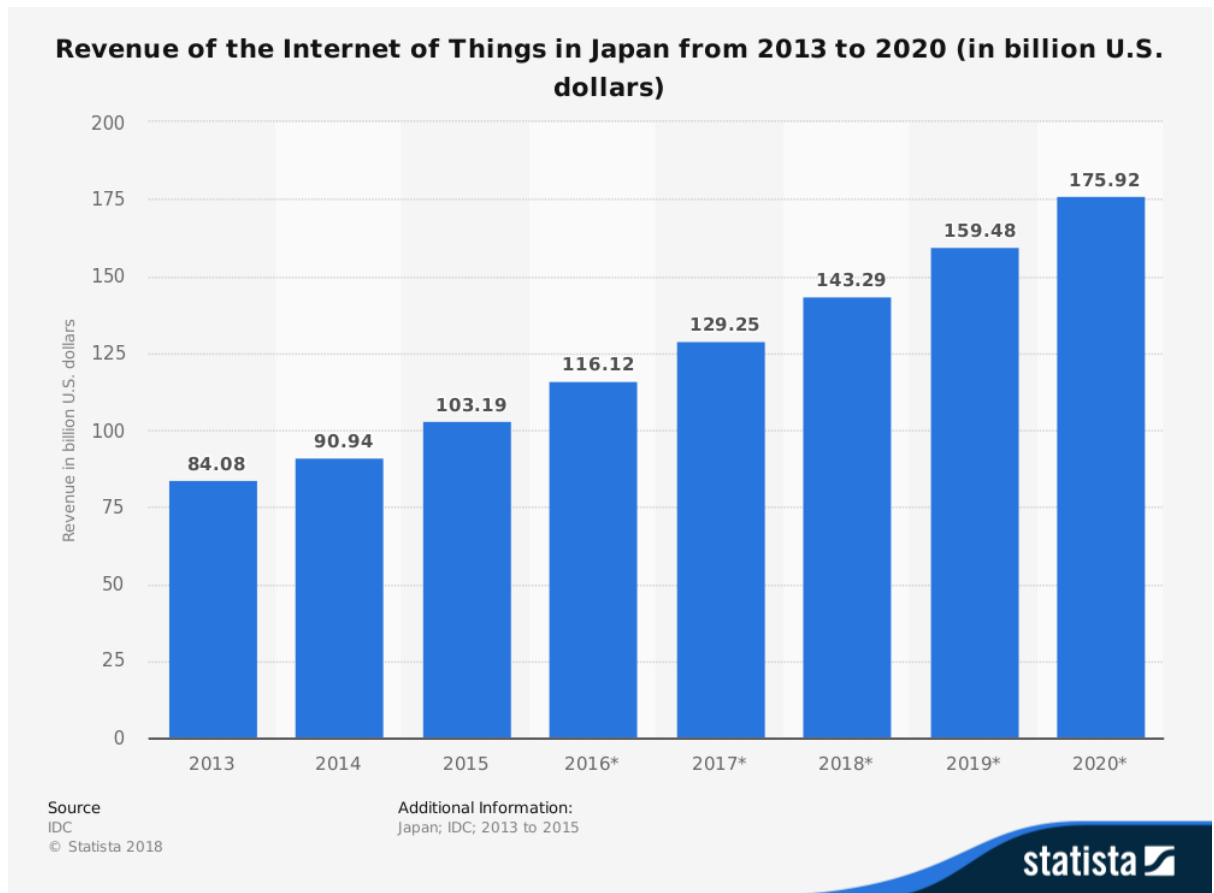
According to the expert's forecasts (26), the IoT market will grow from 158 billion in 2016 to 457 billion in 2020, and will be adapted much widely in various fields. From the figure, we can see that the IoT will be widely used in manufacturing, transportation, finance and health care.

Size of the Internet of Things market worldwide in 2014 and 2020, by industry (in billion U.S. dollars)
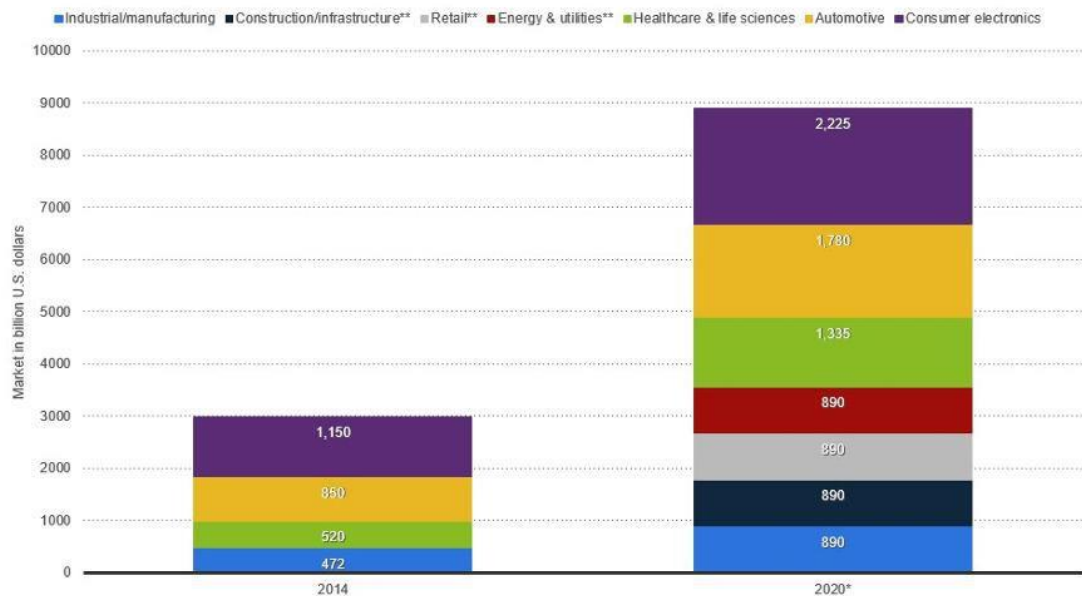
According to the industry survey (27), Japanese users will spend 65 billion USD on the IoT in 2018, and this figure will continue to rise to 112 billion USD in 2022. The data released by IDC Japan even pointed out that the profits of the joint Internet market has reached US$130 billion (28) in 2017.

Revenue of the Internet of Things in Japan from 2013 to 2020 (in billion U.S. dollars)

Source
IDC
© Statista 2018

Additional Information:
Japan; IDC; 2013 to 2015

statista

This Japan's vast IoT market cannot only be seen from the survey above. The attention from Japanese government and academia on IoT and blockchain technology is also indicative. In the 2015 "Japanese Rejuvenation Strategy" (29), the development of the IoT was proposed and valued. The Japanese government has also noticed that Japan has not yet been able to develop enough companies to lead the world in data and related services, and has consciously kicked off rewards and policy support for related projects. She hopes to develop Japan into a key icon in IoT.

3.2 Summary of Challenges

- The volume of individual mobile phone users in the Japanese market is huge and the long usage time, as well as the rapid growth of mobile devices
- The mobile data is massive and in various types, and its the value and potential has yet not been explored
- IoT mobile streaming data market is broad but it faces data security challenges
- Existing data services are not transparent and poor in security aspects.

3.3   MDC's Goals

In order to solve the above problem, we made a proactive idea and try to make it happen.

MDC aimed to make mobile devices connected to form a huge distributed mobile network. Blockchain technologies are used to process these mobile streaming data so as to provide services to individuals and enterprises. We will start with mobile phones and continue to extend our chain to other devices in the IoT. The blockchain features and distributed ledger technology will ensure the special networking equipment is easy to deploy with high level of security on data, equipment and transaction. Moreover, time and resource are saved.

This will have invaluable practical applications in daily life such as scientific research in medical, financial an educational use, gaming analysis and artificial intelligence. MDC also provides countless nodes that can perform node operations on cryptocurrencies and smart contracts for data link operations in the chain economy.

After the innovation of blockchain technology, many companies have also focused to develop IoT and data related processing. However, some applications in the market only focus on data storage or simply establishing a platform for IoT. None of them links among mobile streaming data, IoT and blockchain technology. We, MDC, does exactly what it is to ensure fair and secure processing of mobile data generated by users. An ecosystem with a blockchain and SAAS layer will be constructed. We are also confident that MDC will liaise with other chains to create more diverse stereo for cross-chain services.

Our goal is to become an application and system leader based on proof of work on mobile streaming data to create a new mobile end blockchain ecology!

3.4   MDC's Innovations

- **New mobile streaming data blockchain ecosystem**

MDC will focus on mobile phone, which is the top category in mobile devices, and mobile streaming data which highly under-valued. In the near future, the service will also be expanded to other IoT devices. With detail planning, we will develop our own ecosystem, community, blockchain services, and blockchain-derived digital products

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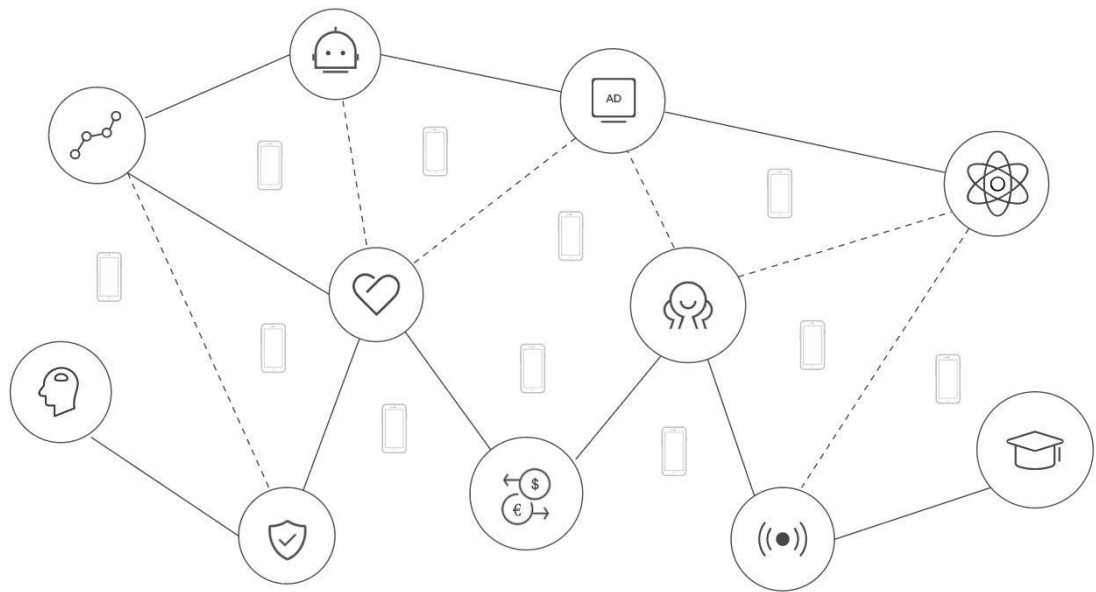
- **Challenge traditional data service system**

  Traditional data service systems: opaque, unfair, inefficient, and plagued by numerous security issues

  MDC: transparent secure

- **Easy to deploy and wide base of users**

  Although MDC is an application based on blockchain technology in mobile data processing on mobile devices, this concept is simple and easy to understand. The reward mechanism and proof of work is fair and effective. The user guide is also very simple that can allow different people joint our chain emerging ecosystem with their mobile devices

不透明　　　　　　　　　效率低

不公平

透明　　　　　　　　　　效率高

公平
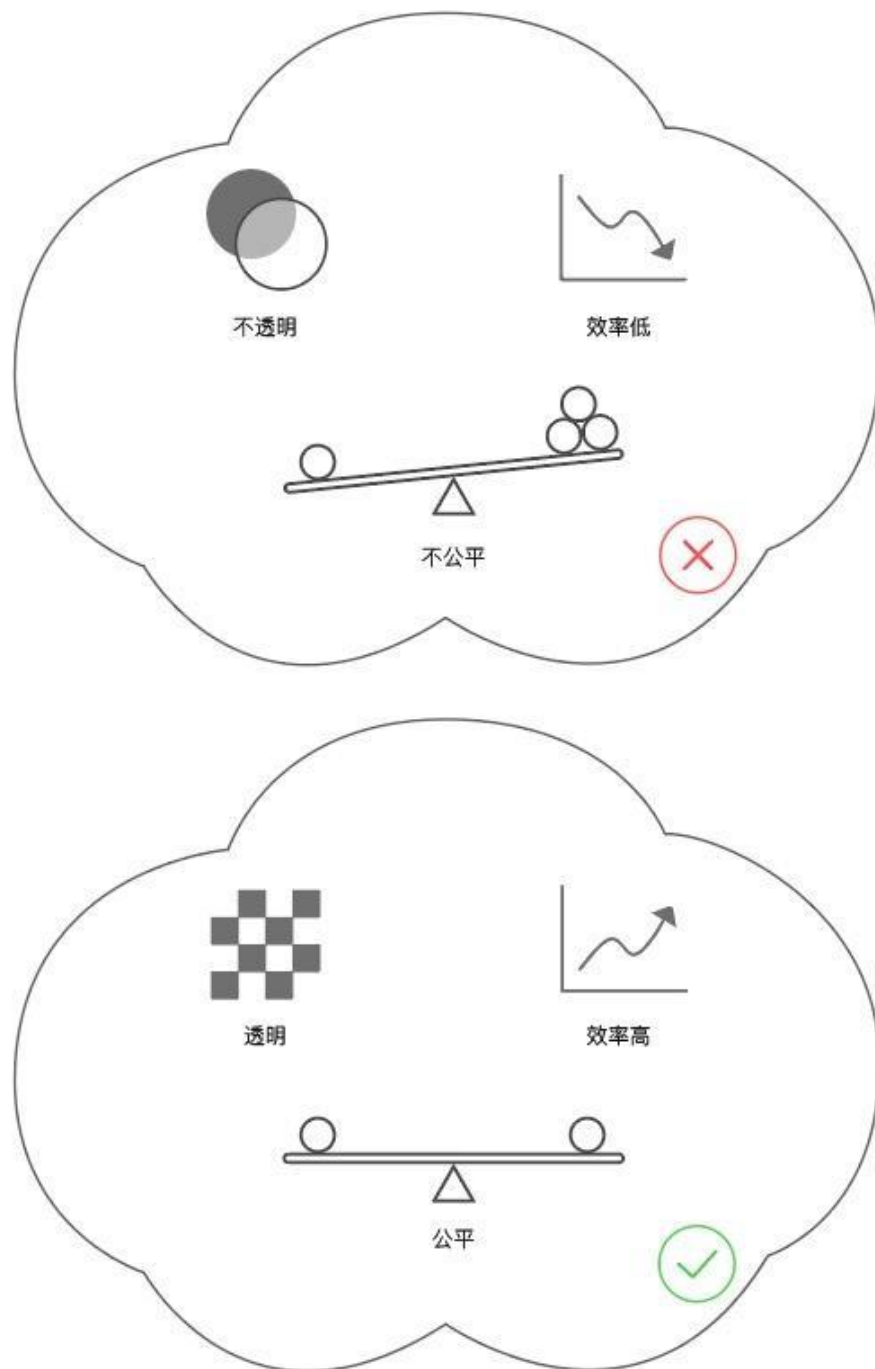
4.0   MDC Ecosystem

MDC aims at creating an ecosystem powered by mobile devices. In this ecosystem, the main roles are mobile data contributors and mobile data users, who are rewarded by mobile data token based on their roles. We will introduce the ecosystem in detail in the chapters below:

4.1   Entering the Ecosystem

- Download MDC App
- Developers install MDC SDK
- Web install

4.2   Mobile Data Contributor (Contributor)

Mobile data contributors are an indispensable part of the MDC ecosystem. The contributors connect their mobile devices to the MDC, and provide streaming data. Take mobile phones as an example: after connecting their phones to the MDC, the contributors can open the App, and the MDC will start collecting various types of real time streaming data according to the smart contracts on the chain. Contributors can then be rewarded following the Proof of Streaming Data.

4.3   Mobile Data User (User)

On top of the MDC, we will build a SAAS model, which will interact with MDC directly, user the real time streaming data uploaded by Contributors, and create multiple products. When Users user the real time streaming data, they will need to pay Mobile Data Token (more details can be find in chapter 4.6).

4.4   Data users outside of the MDC

Although Contributors and Users are the only two roles in the MDC ecosystem, individual and enterprise users can trade with the Users (SAAS) outside of the MDC, and use the streaming data products. Any outside users can obtain the relevant streaming data from the Contributors after purchasing the SAAS products. This service is transparent, real time, and efficient.

For example, a geographical services company may want to collect real time geographical data. However, current data services are often times slow, low quality, and not transparent. Through the SAAS model on top of MDC, and the blockchain technology as well as smart

contracts, this company can easily obtain streaming data in a timely fashion while maintaining high quality. After receiving the high quality data, this company can analyze the data based on their own needs, which will benefit them in developing their business. Furthermore, this geographical services company can also establish a long term relationship with the Mobile Chain SAAS model, which will allow it to receive a bountiful of real time streaming data continuously.
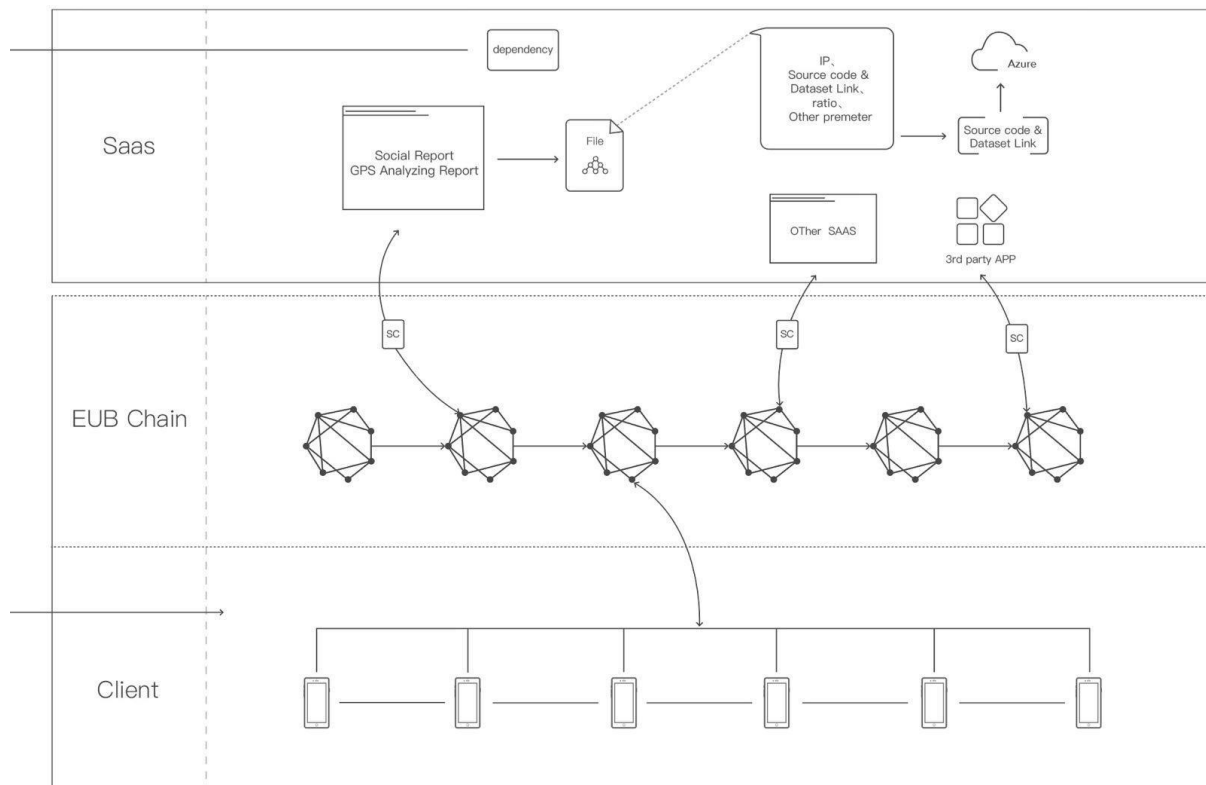
This, of course, is only one example of users outside of the chain using MDC services. More applications of enterprise facing services will be introduced in detailed in chapter 5.5.

4.5 Types of Mobile Data and Their Value

At MDC, we put our focus on the data often neglected by individuals and enterprises – the streaming data that are generated automatically by the phones and other devices. We have seen many projects that put their focus on user-generated data, including personal information, contents generated on different Apps, etc. However, these projects have overlooked the streaming data that is constantly being generated by the devices, and the intrinsic value it carries. The streaming data includes the machine generated log data that has been drawing people's attention recently. Many data analysis companies have realized that the log data that has been ignored actually includes a wealth of information. If we can process and analyze the data

effectively, we will be able to answer many questions regarding device performance and user experience.

Take mobile phones as an example: the most common types of streaming data that is generated automatically include:

Geographical data
Environment data
Log data

4.6   Mobile Data Token (MDT)

Mobile Data Token (MDT) is a digital currency that is used to determine the volume and value of trade of MDC. It plays an important role in the MDC ecosystem, and is the official cryptocurrency of MDC. MDT can be used to reward the Contributors for uploading the data, and Users can use MDT to cover the cost of streaming data usage.

Total MDT supply: 87 million tokens

We believe that as a project that integrated multiples devices and is feasible to be launched, MDC's cryptocurrency MDT best showcases the value of its services. With the development of the IoT and the increasing needs in the market, the market value of MDT will gradually become more and more prominent. Therefore, the earlier and the more you hold MDT, the better chances you have for continuously receiving high quality services.

4.6.1   Proof of Streaming Data

Before explaining the unique consensus mechanism of MDC, let us introduce two of the most common ones.

PoW: Bitcoin laid the foundations for Proof of Work and this concensus leads block generation. However, as it becomes increasingly hard to generate a block, it becomes easier for long side chains to replace the accurate sidechains, which also causes of waste of computing power.

PoS: Proof of Stake. This is be seen as an upgraded consensus mechanism. It controls the mining time depending on how many tokens and how long a node has held thses tokens. PoS can effectively shorten the mining time, however, it still cannot solve the problem of computing power waste.

MDC, on the other hand, will adopt a brand new consensus mechanism that complies with blockchain technology and identifies with the needs of MDC. It can ensure a fair and transparent reward system within the MDC ecosystem.

We define "Streaming Data" as the total amount of data uploaded by the the MDC community members. If a Contributor chooses to connect more devices to MDC for a longer time, and start uploading data earlier, the amount of data they contribute will be larger. Whoever contributes more data will be rewarded with more MDT, and this is all determined by the Proof of Streaming Data in MDC.

Proof of Streaming Data, or PoSD, is a consensus mechanism that incorporates the MDC smart contracts. Since there is an SAAS model on top of MDC, in order to maintain the MDC ecosystem and ensure that the Contributors and Users can interact fairly, whenever SAAS requests to inquire real time streaming data, the Contributors whose data is used will be rewarded again. That is to say, the longer the Contributors stay on MDC, the greater chance their streaming data will be user, and the more they will be rewarded.

Contributors confirm interacting with MDC services → Contributors sign contract → Encrypted data uploaded to MDC → rewarded according to PoSD ← Users obtain relevant data from Contributors, pay MDT in return

4.6.2   Methodology

（1）Mobile streaming data methodology

We define the contributor's ability to provide streaming data as Daily Streaming Provider. In relation to DSP, there are three main variables: streaming data one can contribute per hour (KB per hour), Public Streaming Data (PuSD), and Private Streaming Data (PrSD).

The DSP calculation formaula is:
DSP = PuSD * k - PrSD * y

When PrSD equals to 0, DSP equals the Public Streaming Data. Also, k would continue to decrease whereas y would continue to increase. The relationaship between k and y is $y = \ln(k / (1-k))$

$$y = \ln(k / (1-k))$$
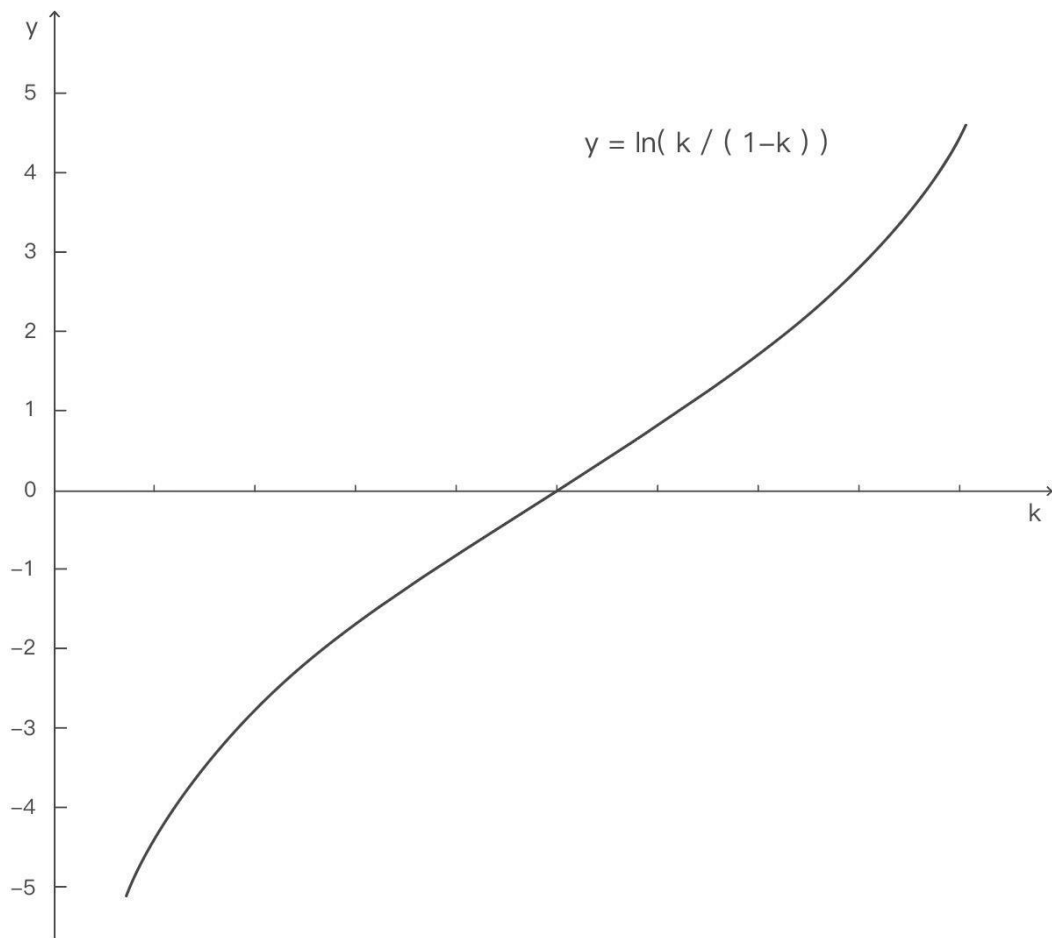
We can see from this chart that when k approaches 1, y is approaching ∞. On the contrary, when k approaches 0, y is approaching -∞. This proves that the earlier people is involved, the better they can control their budget.

We will be introducing the PuSD and PrSD concepts, as well as the mining difficulty in chapter 4.6.3 below.

(2) Power Ranking

The MDT distribution, the amount of data Contributors can provide are ruled by probability under normal distribution. Therefore, we categorize the overall streaming data provider power ranking into four groups by standard deviation:

A: $(+2\sigma, +\infty)$
B: $(0, +2\sigma)$
C: $(-2\sigma, 0)$
D: -2σ or below
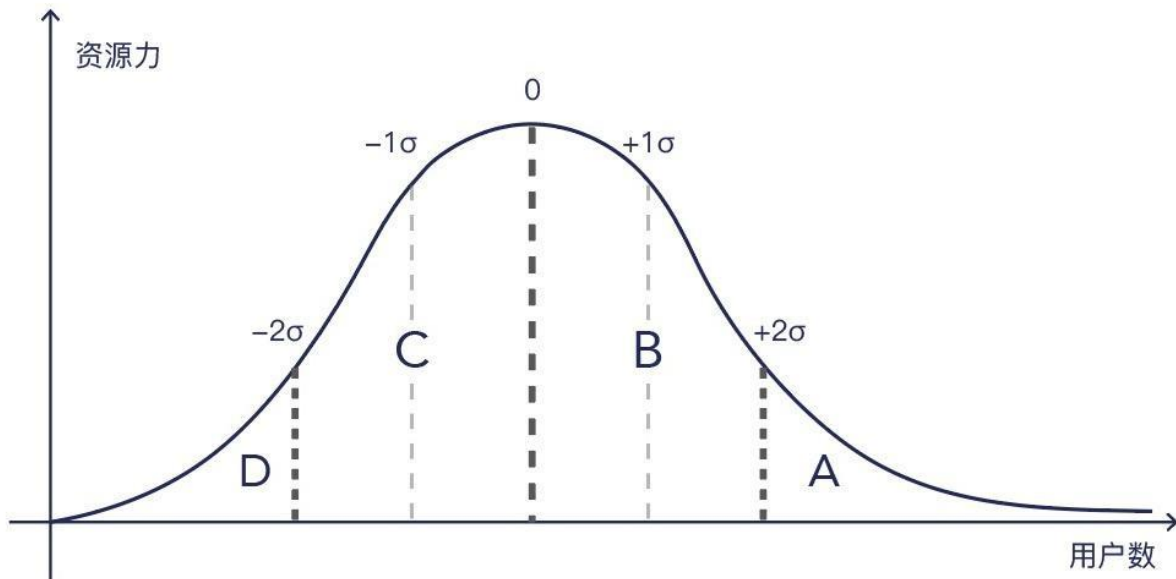
(3) The calculation of DSP standard deviation

We know that DSP is the number of MDT a Contributor can be rewarded every day.
σ_μ is the standard deviation(8) of DSP, and the calculation formula is as follows:

$$\sigma_\mu = \sqrt{\frac{1}{n}\sum_{i=1}^{N}(DSP_i - \mu)^2}$$

In this equation, $\mu =\underline{DSP}$, μ is the mean of DSP, and is also the only minimum value of the δ_μ sequence.
From the perspective of geometry, standard deviation can be understood as a function of the distance from a point in n-dimensional space to a straight line. To give a simple example, there are three

values, DSP_1, DSP_2, DSP_3. They can determine a point P in a three dimensional space. P = (DSP_1,

DSP_2, DSP_3)。 Imagine there is a line L that passes through the origin: $L = (r, r, r)\colon r \in R$. If the three values are equal, then P is one point on line L, and the distance from P to L is 0, and the standard deviation is also 0. If the three values are not equal, then we do a vertical line PR perpendicular to L, PR and L meets at point R, and the coordinates of R equals to the mean of the three values: R = ($\underline{DSP}, \underline{DSP}, \underline{DSP}$)。

Through calculations, we can see that the distance between P and R (which is the distance from point P to L) is $\sigma\sqrt{3}$. In a n-dimentional space, this law still applies, we only need to replace 3 with n.

（4）Algorithm for Daily supply of MDT

We define the standard deviation between $(+2\sigma,+\infty)$ as Group A Contributors, who can divide 50% of the MDT distributed on that day, which is
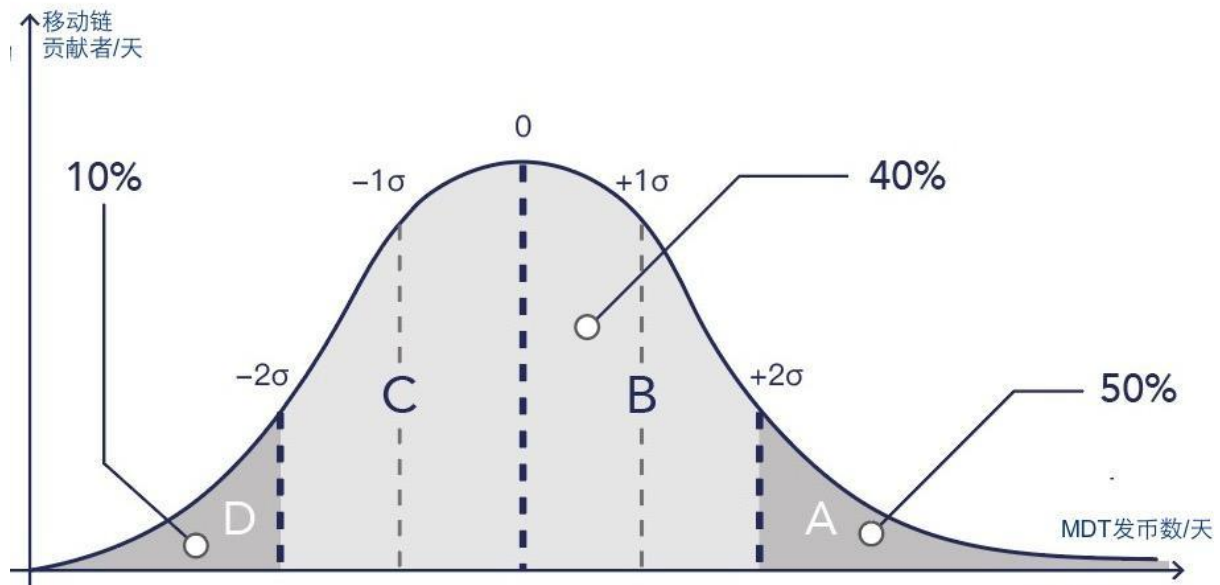$100,000\times 50\% = 50,000$ tokens.
The standard deviation between $(-2\sigma, +2\sigma)$, who are Group B and C Contributors, can divide 40% of the MDT distributed on that day, which is
$100,000\times 40\% = 40,000$ tokens.
The standard deviation below -2σ are Group D Contributors, and can divide 10% of the MDT distributed on that day, which is
$100,000\times 10\% = 10,000$ tokens.

4.6.3   Mining and Mining Difficulty

In the MDC ecosystem, the process of Contributors providing streaming data and being rewarded by MDT following PoSD is called mining.
Different from the standard approach of combining computing power as the mining pool, the "mining pool" in MDC is the streaming data from all devices from the members (e.g. mobile phones and other devices in the IoT).

We define that: when mining the first 30% of MDT, there is no private streaming data pool. All Contributors need to contribute streaming data to the public streaming data pool. Only after the first 30% of MDT are all mined will the private streaming data pool appear.

In the private streaming data pool, the streaming data is collected by private parties, but still traded with MDT. Therefore, in the mobile streaming data methodology, in order to make sure that the early stage Contributors and followers can continue to contribute to the development of MDC, k will decrease by year while y increases by year. That is to say, it will become increasingly difficult and expensive to mine with the private streaming data pool.
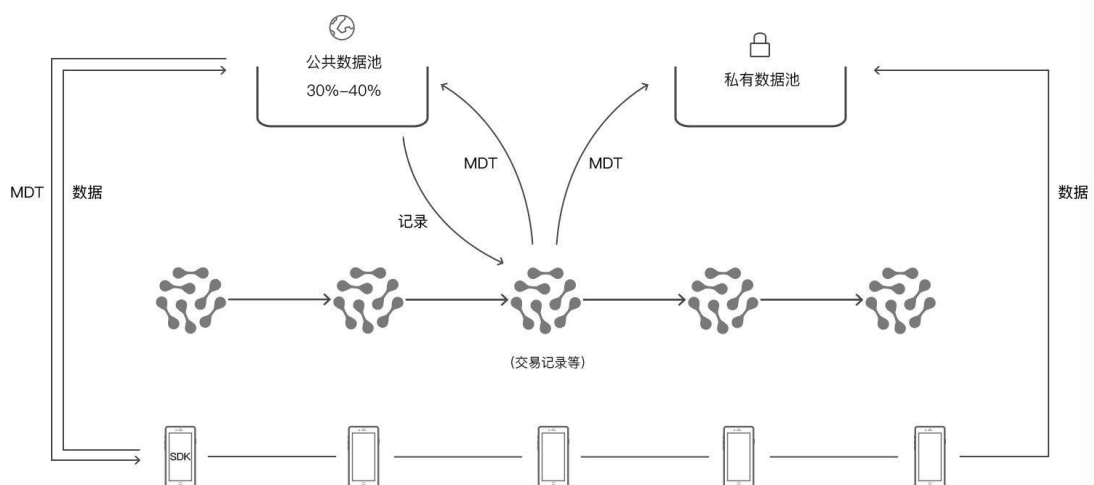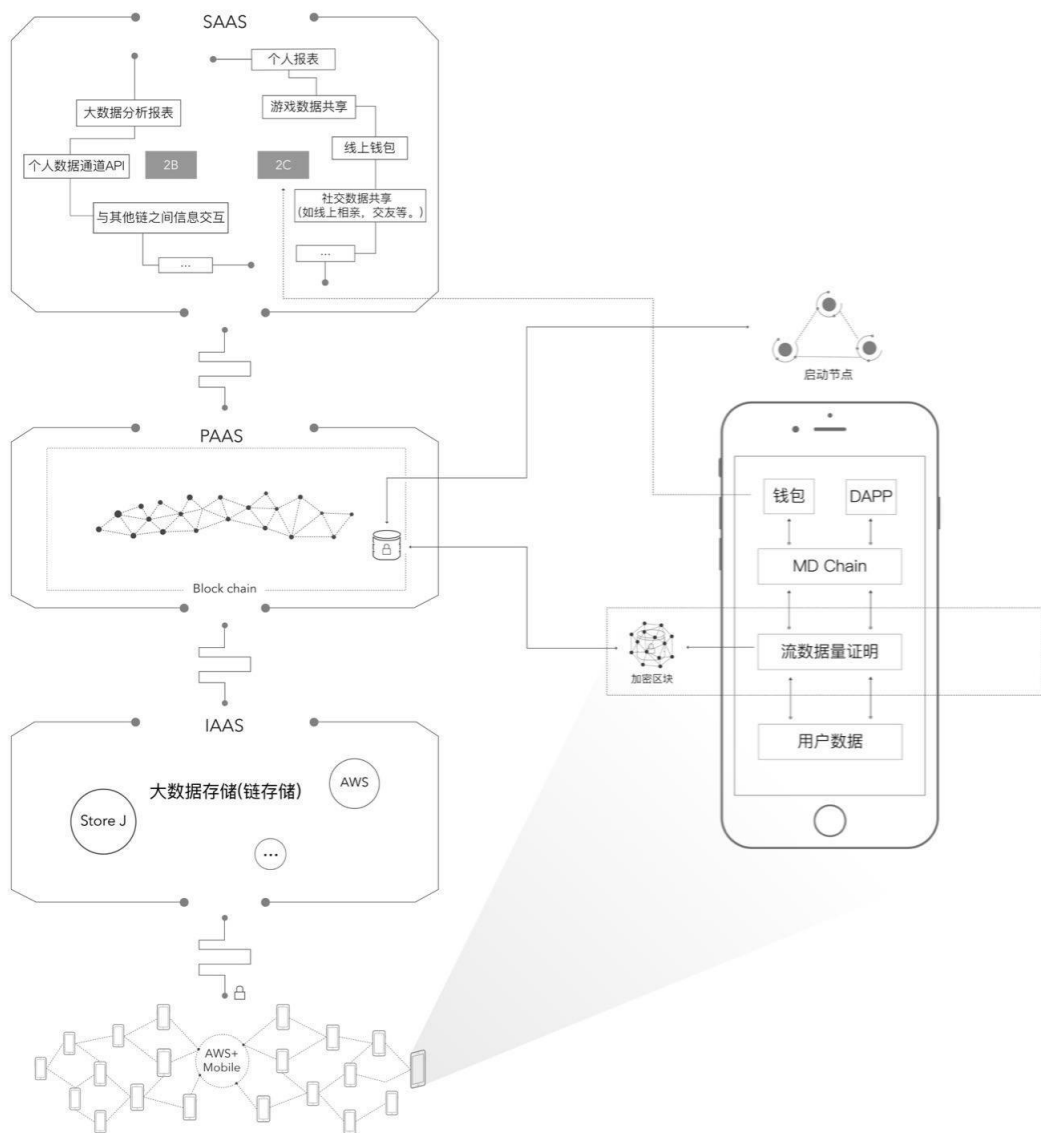
4.7   MDC's Structural design

We will divide MDC into two levels, the MDC and the SAAS model (Software as a service). MDC is based on blockchain technology, and interactive with Contributors directly through smart contracts. The mobile devices of Contributors form the infrastructure, laying a solid foundation as well as serving as the fundamental source of MDC. Through the encrypting technologies on the chain, we will connect the streaming data uploaded by Contributors with PoSD. This will ensure that we can provide the SAAS model with different types of data while maintaining data security.

The SAAS model level provides a comprehensive application. Inside the MDC ecosystem, we can obtain real time streaming data from the interaction between MDT and Contributors. Outside of the MDC, SAAS can connect with individual or enterprise users, and provide different types of products. If an outside user requests to obtain non-real time streaming data, or request to archive data, they can also submit these inquiries. Our team consists of cloud computing experts, who specializes in using cloud technologies to solve data storage issues. At the beginning of the project, the data will be stored through AWS cloud services. When the blockchain storage technologies are more developed and mature, we will switch to those services such as Storj.
The SAAS level provides a list of comprehensive decentralized applications, aiming at both 2C and 2B users, meeting their distinct data needs in various scenarios.

MDC will also create a complete SAAS service for developers, enabling them to access data on MDC easily in their own software.

SAAS

个人报表

大数据分析报表

游戏数据共享

个人数据通道API 2B

2C 线上钱包

与其他链之间信息交互

社交数据共享
（如线上相亲，交友等。）

...

...

启动节点

PAAS

Block chain

钱包 DAPP

MD Chain

流数据量证明

加密区块

用户数据

IAAS

大数据存储(链存储)

AWS

Store J

...

AWS+
Mobile

5.0 MDC's Development Plan

5.1 Development of MDC's Main Chain

5.2 Accessing Exchange by MDT

5.3 Development of MDT's customer software（APP）

5.4 Customer to Customer（2C）

MDC provides a channel for mobile data between consumers and consumers. For example, for 2C users: personal data exchange; personal reports; personal data sharing, etc.; And for individual researchers, MDC gives them the possibility to obtain large amounts of mobile data in real time. For individual research projects, the old problem, that it is difficult to obtain or collect meaningful data, has been solved.

MDC starts from mobile phone then divert to other mobile device, leading to ultimately linking with IoT. Consequently, MDC will become a part of daily life, making changes on people's norms.

5.5 Business to Business（2B）

- **Machine Learning**

  Currently, machine learning is one of the hottest areas. One of the major problems faced by machine learning is how to obtain the data and use it train machines. This can be divided into data quantity, data acquisition speed, data type, and data quality. The data service provided by MDC can perfectly solve these four problems. With the large amount of instant and high-quality mobile data generated by the data contributors, products can be developed to suit for machine learning for enterprises. Our project can allow us to use the mobile data to tailor make for different machine learning algorithms and models.

- **Health Care Industry**

  We believe that insights can be realized by using mobile streaming data. For example, streaming data + medical care as a smart medical system.

  For insurance companies, geographical information and health data generated by mobile devices can also allow them to evaluate customers to provide better services precisely.

Although many existing projects already provide data for medical and insurance companies, they are not able to provide accurate, instant, and large in volume mobile streaming data. In the leading report of the blockchain industry, McKinsey expressed optimism about the development combining blockchain technology with the insurance industry. Therefore, we are very confident with the application of MDC to cater for health and medical industry.

- **Equipment maintenance and operation analysis**

    Application, server and business process logs, call detail records and sensor data are the main examples of machine data. Internet clickstream data and website activity logs also involving machine data. By combining machine data with other enterprise data to analyze, this can provide new insights and ideas for business activities and operations. For example, some large industrial manufacturers are analyzing machine data for field device performance and historical performance data to better understand service and try to predict device maintenance issues before a machine failure occurs.

- **Natural disaster monitoring and warning**

    In the future with various high-tech mobile devices, we can see many examples of applications such as mobile devices for monitoring oil and gas pipeline settings, natural disaster warning systems based on the data from ocean sensors, data acquisition prediction systems from satellites and weather stations to help predicting weather in geographic areas and data obtained from HVAC And elevator to improve the efficiency of building energy management systems. As emerging machine learning applications begin to mature, many other applications are definitely coming up. It can be seen that these scenarios using mobile streaming data and machine data will bring tremendous benefits to daily life to solve problems and reduce costs.
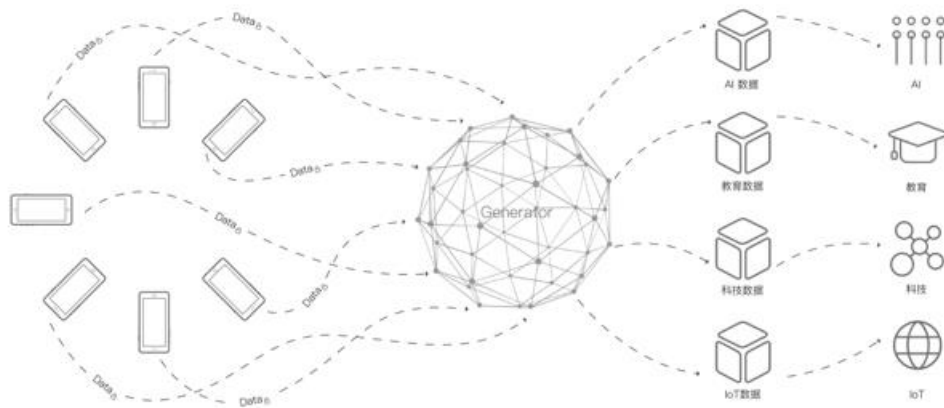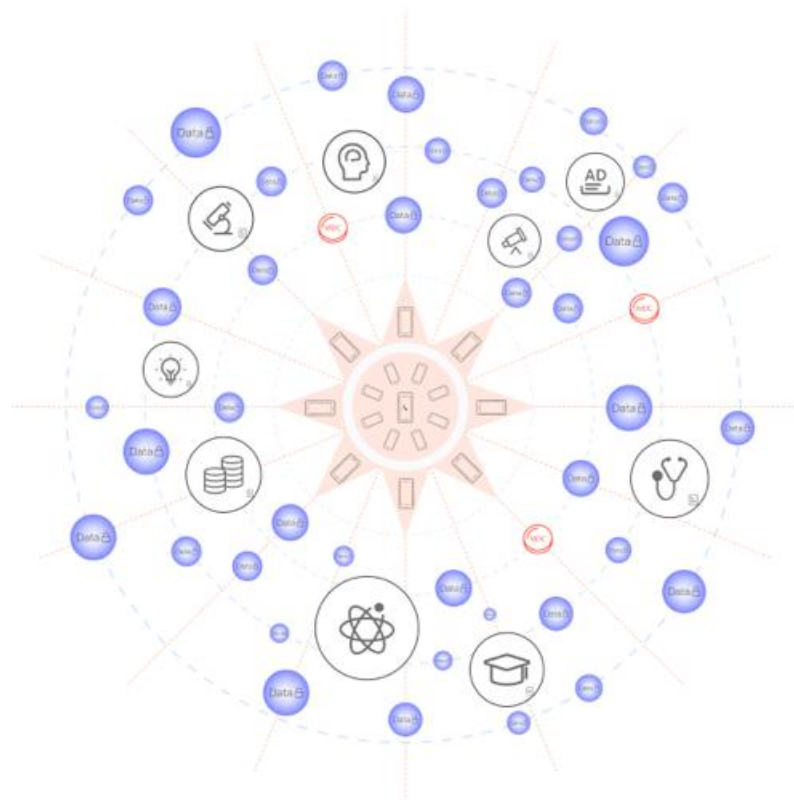
5.6 SDK Development

Targeting some open source software developers, MDT can mined by SDK open source by embedding their own open source software with MDC to support MDC's ecology

6.0 Sustainable Market Development

The MDC's project team will work hard to create a new ecosystem of mobile devices and IoT and promote applications combining mobile data, IoT and blockchain technology.

6.1 Development of Second Tier Chain

Based on the main chain of MDC, we will open the secondary chain for other IoT devices such as smart refrigerator chain, smart car chain. To enhance the ecological diversity of MDC, we can ultimately create a comprehensive IoT mobile blockchain system with extensive coverage.

6.2 Establishing Streaming Data Resource Platform and Cross-chain Services

With the increasing number of users, the expansion of community and the development of the ecosystem, a data resource platform will be established at the right time to meet the needs of different individuals and enterprises by blockchain technology.

We believe that MDC can link different kinds of data and provide the possibility of cross-chaining. For the future development, MDC will corporate with other chains to create more different types of cross-chain services. For example, we will work with Ethernet chain to facilitate the performance of mobile streaming data on the mobile devices to provide a deeper industry analysis.

6.3 Global Penetration

In addition to the mentioned development plans above, we will also develop the commercial layout of MDC on top of the Japan's perceived market. We will radiate to other Eastern Asian regions such as China, Hong Kong, Taiwan, and South Korea. For markets outside Eastern Asia, we will introduce different MDC's services based on the differences in regional culture, infrastructure, and policies.

Note: The above market layout may change with market demand, environment and other factors.

7.0 Allocation of MDT

Total MDT Supply: 87million tokens

Proportion	Number of Token	% Split	Purpose
Non- issued 50%	50,000,000	40%	Release according to PoSD to Contributors

		10%	Early-bird rebates
Issued 50%	50,000,000	10%	For the fund of MDC such as community building, bonus, and international market promotion
		30%	Open to venture capital and use for early development including talent resources and hardware acquisition
		10%	Start-up team
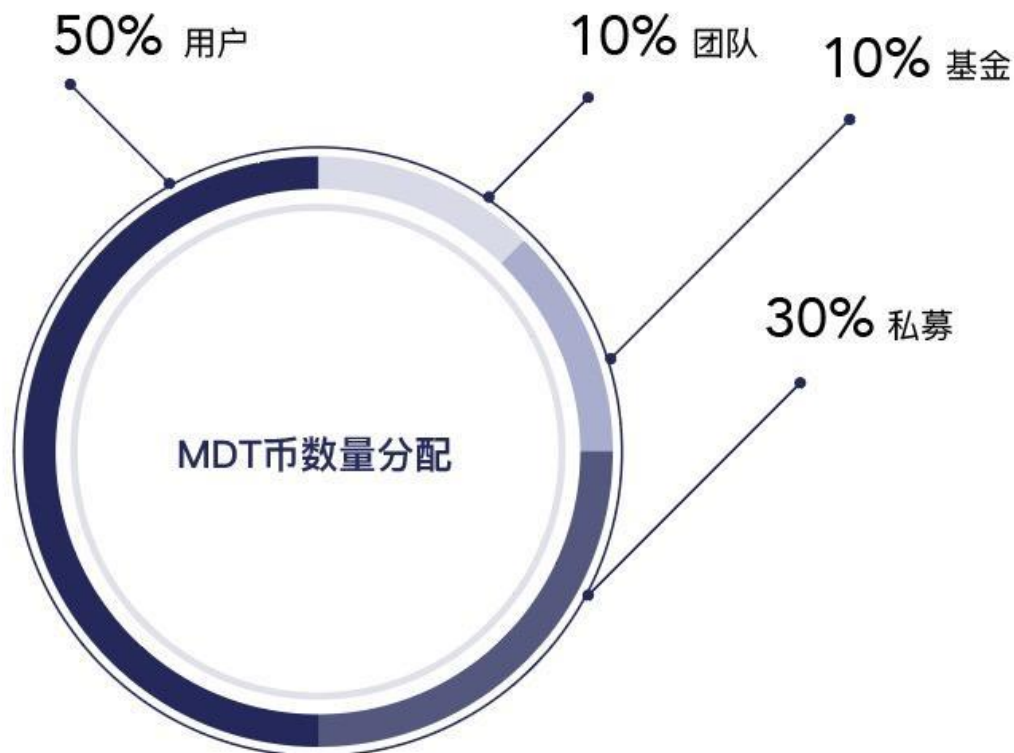
Note: The start-up team tokens will be locked for 12 months and cannot be traded. It will be released linearly within two years after the lock is lifted.

There are three ways to obtain MDT:
- Download MDC App, contribute your own streaming data, and rewarded according to PoSD
- Trade through third party exchange markets
- 2B, connect to third party mining pool, rewarded from contributing streaming data

8.0 Disclaimer and Risk analysis

Disclaimer

This document is only for conveying information and does not constitute an opinion on transaction of project shares or securities. Any proposal or request for offer to such effect will be made under credible terms in accordance with the permission of applicable security laws and other related laws. The above information or analysis does not constitute any investment decision or concrete advice.

This document does not constitute any investment proposal, investment intent or investment solicitation on securities. This document does not constitute and shall not be construed as a transaction offer or an invitation to transact any form of securities, neither is it a contract or promise in any form.

All the examples of returns and profits in this document are for demonstration purpose only or represent the industrial average, and do not constitute a guarantee for the result of user's participation.

MDC clearly states that users with relevant intent shall have clear knowledge of risks on BC platform. By making investment, investors confirm their knowledge and acceptance of the project risks, and are willing to personally take responsibility for all corresponding results or consequences.

MDC clearly states that it will not take responsibility for any direct or indirect losses arising from the participation in MDC project, including: (i) reliability of all information provided in this document; (ii) any resulting mistake, negligence, or information inaccuracy; (iii) or any subsequent behavior.

MDT is a digital Token used, besides other scenarios, on MDC platform. MDC is not an investment target and we cannot guarantee the value addition of MDC, whose value may decrease under certain conditions. Due to unpredictable factors, targets listed in this White Paper may change. While our team will make its best efforts to realize all targets stated in this White Paper, all individuals and groups purchasing MDT shall shoulder the risks on their own.

MDC does not represent a right of ownership or control. Controlling MDT does not mean ownership of MDC or MDC applications. MDC does not confer any right on any individual to exercise participation in, control over or decision-making on MDC and MDC applications.

Risk analysis

As a new model of investment, investment in digital asset involves various risks. Potential investors shall discreetly assess the investment risks and their own risk tolerance.

 Risks on Token Sales Market

The environment of Token sales market is closely associated with the situation of the whole digital currency market. In case of sluggish overall market situation or existence of other uncontrollable factors, the price of Token may be underestimated over a long period of time, in spite of their own good prospect.

 Supervision Risks

Since Blockchain is still in the early stage of development, there are still no laws and regulation across the world, including in China, that stipulate requirements for precondition, transaction, information disclosure, and locking, etc. in the process of ICO. Also it's still unclear as to how the current policies will be implemented. All these factors may bring uncertainty to project investment and liquidity. Blockchain technology has become the main target of supervision in major countries of the world. If there is any intervention or exertion of influence by supervising authorities, MDC application or MDT may be affected. For example, if there is legal limitation on the use and sale of Token, MDT may suffer restriction and obstruction, or the development of MDC application and MDT may be directly terminated.

 Competition Risks

With advancement of information technology and mobile Internet, digital assets with "Bitcoin" as a representative are gradually prospering and various decentralized applications are continuously emerging, heating up industrial competition. With the steady appearance and expansion of other application platforms, the community will face constant operation pressure and certain risks from market competition.

 Risk of Talent Loss

MDC has gathered a technical team and expert consultants with leading advantage and profound experiences in their respective professional sectors, including professionals with lasting engagement in the Blockchain industry and core team with rich experience in development and operation of Internet product. The core competitiveness of MDC in the industry lies in its stable core team and consultant resources, the loss of which may affect stable platform operation or its future development.

☐ Risk of Development Failure Due to Fund Shortage

In case of dropping price of Token raised by the founding team or prolonged development time, the team may face a shortage of development fund and possibly even suffer subsequent serious shortage of fund for all activities. In such case, there will be a risk that the intended targets will not be realized.

☐ Risk of Private Key Loss

After the digital wallet address of MDT is extracted by the buyer, the only means to operate content contained in the address is by his/her associated secret key (private key or wallet passcode). Users are personally responsible for protecting the associated secret keys which will be used to sign transactions and prove their asset ownership. Users understand and accept that if his/her private key document or passcode are respectively lost or stolen, his/her MDT associated with his/her user account (address) or passcode will be unrecoverable and permanently lost. The best method for secure storage of log-in document is to store the secret key separately at one or several places and avoid using a shared computer for this purpose.

☐ Risk of Hacking or Theft

There is a possibility that hackers, other entities or nations may attempt to interrupt MDC application or MDT function with any methods, including but not limited to DoS attack, Sybil attack, guerrilla-style attack, malware attack and homogeneity attack, etc.

☐ Risk of Absence of Loss Insurance

Unlike bank account or accounts with other financial institutions, MDC account or related Blockchain network are generally without any insurance guarantee. For losses under any conditions, no public individual or public entity will provide insurance.

☐ Risk of Core Protocols

Currently MDC platform is developed on the basis of Ethereum. In case of any defect, unexpected malfunction or attack to Ethereum, MDT or MDC platform may suffer a stop or loss of function in a manner hard to expect.

☐ System Risk

There are risks related to neglected critical defects in open source software or large-scale failure of global network infrastructure. Though some of the risks may drop over time due to bug fixes and breakthroughs in computation bottleneck, other risks are still unpredictable, such as political factors or natural disasters that may interrupt part of the Internet or the global Internet as a whole.

☐ Risks Due to Bugs or Cryptography Development

Rapid cryptography development and advancement of science and technology such as quantum computer may bring the risk of cracking to MDC platform, leading to possible MDT loss.

☐ Risks of Insufficient Attention

There is a possibility that MDC application may fail to be used by a large number of individuals or entities. This means that the public do not have enough interest in developing and improving the

relevant distributed applications. Such lack of interest may bring negative impact to MDT and MDC application.

☐ Risk of Poor Acceptance or User Shortage

First of all MDT shall not be deemed as an investment target. Even if MDT may have some value after some time, such value can be very small if MDC is not accepted by the market and is therefore short of users. There is a possibility that due to any possible reasons, including but not limited to failure in business relations or marketing strategy, MDC platform and all the future marketing efforts supported with the raised fund may fail to achieve success. In such case, there will be few or no follow-up supporters for the platform. Of course, this will be very unfavorable to this project.

☐ Risk of Application Defect

MDC platform may fail to provide normal service due to defects caused by known or unknown reasons (e.g. large-scale Node crash), and may even suffer loss of user MDT in a serious situation.

☐ Risk of Application or Product Failing to Reach Their Expectation or Buyer's Expectation

MDC application is still under development stage, and major changes may be made before the launch of official version. The expectation or imagination by MDT itself or by buyers for the function or manner (including behaviors of participants) of MDC application or MDT may not be satisfied. Such situation may be caused by any analysis mistake or change of a single design, etc.

☐ Other Unpredictable Risks

Token which is based on cryptography is a fully new technology that has not be tested. In addition to risks already described in this White Paper, there are other risks that are not yet mentioned or not anticipated by the founding team. Also, other risks may come suddenly, or several risks mentioned above may occur in combination.

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