c0ban: a crypto currency is for advertisement and entertainment apps v0.2

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***Abstract*—c0ban is the world's first crypto currency tied up with entertainment and advertisement services from the beginning. Its application will be released on App store and Google play on January 2017. It aims at destruction and creation of advertisement market by taking advantage of micro payment feature of blockchain. The paper describes initial introduction of c0ban, its business model and update information from version 0.12 released on September 2016 [1]. Regarding to blockchain, Bitcoin technologies are applied on c0ban because of its stable performance. Enhancement has been done to fit c0ban business model.**

***Index Terms*—blockchain, advertisement, micro payment, hash calculation algorithm, consensus algorithm, proof of work, Bitcoin**

I. Introduction

A. A crypto currency, c0ban

IT is told that blockchain is the next generation technology after internet. Among variety of features that blockchain provides, we focused attention on its capability to send small amount of value, even 1 cent, anytime and anywhere with low cost of commission fee. We believe that it would be the best new manner we should take advantage of. The revolution of blockchain could deliver such micro transaction to us on decentralized P2P network. Although distributed computing was used to allocate information resources on each node to secure the reliability of whole system [2], it could be realized by allocate whole information resources on whole peer which is completely opposite concept from legacy theory.

On the other hand, our team members have experiences in launching new business in not only E-commerce, telecommunication, web services, and other kinds of IT services but also food & beverage, apparel, beauty industries etc. so far. Every time when we try to start new business, we worry about how to acquire loyal customer efficiently. However, it is very difficult to find them in advance and also have to spend lots of advertisement expenses. Several kinds of cost-effective advertisement technologies have been introduced so far such as targeting advertisements, remarketing advertisements, or advertisement shown based on viewers' behaviors. Those fee are mostly calculated by the number of impressions or the number of clicks. Although it might sometimes work, it is still unclear if its viewers really see the advertisements or not.

In addition to that, expenses for advertisements are paid to advertisement agencies from advertisers. Any reward nor fee are not transferred to expecting customers from advertisers directly. It is because it has been difficult to establish micro payment system without blockchain technologies so far. Advertisers had no method to proceed it. If small amount of value can be sent from advertisers to their expecting customers directly, it may help to capture their customers in advance. It is a reward by view model. We have been seeking for a technology which can achieve the model for years. Blockchain technology with micro sending is the best fit solution for it. This is our main motivation to create new crypto currency called c0ban /kòbʌn/ to proceed it.

II. Service concept of C0ban

A. Business model of c0ban

MAIN concept of our services is combination of fintech and advertisements. Here is its business model.

Any corporate (shop) can post their PR videos on our services or app. Once the PR video is viewed by a consumer, small amount of crypto currency, c0ban, will be given to the consumer. It means that the consumer can earn c0ban by just viewing PR videos as shown in figure 1. As a result, consumer and corporate (shop) will be engaged tightly.

Conosumer will have a chance to exchange c0ban they earn to their local currency. On the market, prices of c0ban is floating exchange rate system, as are other crypto currencies where consumers could receive benefits or exposed to risk. That is why we call it combination of fintech and advertisements.

On launching a new business, it is crucial to provide certain number of places where the service can be utilized. It would be difficult for any player to explorer such places at early stage, however it could be easier for our c0ban business model. It is because corporates (shops) who provide c0ban to consumer would have incentive to support c0ban at their places or shops. If c0ban is used at their places, it means that c0ban is returned to their wallet directly. c0ban returned could be used for their next promotion as well as it could be exchanged to their local currency at market. Corporates need to purchase c0ban for their initial promotion, but its cost could be reduced once c0ban is used by their consumer. Thus, corporates (shops) will promote c0ban usage to their expecting customer aggressively.

The merit of c0ban promotion could be described concretely as followings, comparing other two legacy promotion methods. First one is coupons, second one is loyalty points.

When a corporate runs an advertisement on newspaper or magazine with coupons, its advertisement costs need to be paid

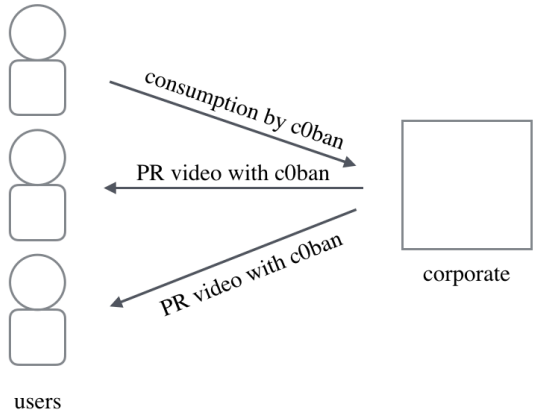

Fig. 1. Business model

initially. In addition, cost of discounts for coupons would be needed to be covered by the corporate itself when consumer use it. In this case, corporates is forced to bear dual burden of promotion expenses.

In terms of loyalty points, corporates who provide loyalty point program need to cover security for discounts of using loyalty points. In common, loyalty points would be given to consumer when they purchase something. It would be treated similar to account payable. By the other manner of expression, it is just discount for corporate which may lead to lower sales.

On the other hand, if corporate uses c0ban promotion instead, the promotion cost could become zero on optimal case in theory as long as all c0ban is returned.

Assume, C is the amount of c0ban cost which corporate purchase from market. r^i is the ratio of returning c0ban after ith promotion. In this case, remaining c0ban after t times promotion, C_t is described as following.

$$C_t = \sum_{i=1}^{t} Cr^i \quad (1)$$

$$= \frac{Cr(1-r^t)}{1-r} \quad (2)$$

$$= \frac{Cr}{1-r} \text{ where } t = \infty \quad (3)$$

Since c0ban runs on blockchain, the model includes the following unique aspect. Promotion by using c0ban could cross the border. The services will be launched in Japan first it will be expanded to Asia and the rest of the world shortly.

Our target of c0ban unit amount that corporate provides to consumer is approximately $20 value of c0ban at one hour conversion for Japan market. Basically, the length of each PR is 15 seconds or 30 seconds. If its composition ratio is equal, average length of PR video is 22.5 seconds. If a consumer watches 160 kinds of PR videos, it would take one hour (22.5 times 160 is equal to 3600 seconds), equaling to $20 of labor per hour. In this case, 12.5 cents would be given to consumer as reward by view.

In Japan, advertisement market size is approximately 6 trillion yen (60 billion USD). Assume that 12.5 yen (12.5 cents) per view is rewarded to viewers. 1.3 billion views per day ($6trillion/12.5/365$) with c0ban could be played where whole advertisement fee is spent on c0ban. If 10 million users are active every day, 130 times per each user could be promoted on our services. As a result, whole 10 million users would have chance to earn 1625 yen (16.25 USD) every day through our app where whole advertisement expenses are dropped on c0ban apps.

Since it is blockchain, the value could be sent to beyond boarders. For example, if marketers will think of targeting users in India, the following cases might happen. GDP per capita in India is around 1,500 USD. It is smaller than one twentieth times of Japan one. For such countries, unit amount of c0ban provided by PR can be set $2 per hour which is smaller than one tenth of the above setting for Japan case. It should still be very appealing to people in India.

One could say that c0ban promotion from Japan or developed countries to emerging markets could create job opportunities. They would begin to seek for PR videos on our apps which provide products or services they want to purchase. C0ban will be rewarded through viewing the PR videos to them, then they would come to shop to purchase product introduced on the PR videos by using c0ban they earned.

Promotion and consumption are engaged tightly now. Its good cycle would run autonomously. The business model of c0ban could have an impact to change structure of legacy advertisement market. C0ban app is planned to be launched on January 2017.

B. Issues on existing crypto currency

We have been seeking and taking into consideration which crypto currency would fit our business model or what crypto currency should be designed for it. Our main goal is not invention of an innovative new concept of blockchain nor crypto currency. What we should do is preparing the best fit crypto currency for our business.

Although $Ethereum$ has several innovative features[11], new type of technologies are side by side with risks as known of incidents, the DAO attack[4]. As described at previous section, requirements of crypto currency for our business model are micro payment with low-cost operation. In addition, services should be launched as early as possible because no one doubt that speed is a crucial factor for success of business. That is why it is decided that c0ban would be designed based on *Bitcoin* blockchain technologies.

Why Bitcoin? As known, Bitcoin is the first practical stage of crypto currency which achieves micro payment function with low cost operation. Eversince Bitcoin began running on public, there has been no downtime over the past seven years. Comparing to systems of megabank, zero downtime for more than seven years would be evaluated to be highly reliable system in general. In addition, it is estimated that the number of core developers is more than 400 which would be twice or more than engineer networks of other crypto currencies such as Ethereum[8], [9]. We have decided Bitcoin technologies for

c0ban based on the above achievement. We hope 400 bitcoin core developers would join c0ban engineer network as well to update c0ban block chain. As of December 2016, we have 10 core c0ban engineers.

However, taking specifications of Bitcoin into consideration strictly, its functions are not the best one. Especially, transaction speed and authorization speed do not fit for our business. For example, only seven transactions could be processed in a second on Bitcoin. It is quite small capacity for c0ban app. Since rapid growth of users is expected, the issue should be solved from the beginning. In terms of authorization speed, it would take at least 10 minutes by Bitcoin or one hour for pursuing more security because six blocks would be needed to finalize authorization in common. General payment at stores could be installed as normal use cases of c0ban. The faster authorization, the better. Hence, speeding up of authorization would also be crucial factor for c0ban.

III. Specification of C0ban in details

ALTHOUGH c0ban is designed based on Bitcoin, the following two issues will be tackled to solve. Firstly, it is increasing the number of transactions per seconds, the other is speeding up of authorization time. The two enhancements could be achieved by adjusting both block size and block generation interval simultaneously. We have done whole experiments to decided what block size and block generation interval would be the best for c0ban.

In this paper, installation of *segwit* is described in detail to achieve the above two enhancements. Consensus algorithm is discussed at section III-F. Detailed specifications such as the number of total coins issued, etc. are referenced in Appendix A. Other basic technologies could be referenced from Bitcoin white paper[5].

A. Block size

Average size of transaction on blockchain is mostly fixed size as shown in TABLE I and II. All transaction are stored in a block of blockchain. Hence if a size of block is large, more transaction could be processed in the block. Simply but, the bigger the size of block, the more transaction could be done.

To increase the number of transactions per second, the best way would be to make the block size large. 4MB to 20MB of block size are considered for c0ban and its demonstration experiment has been conducted. As known, 2MB of block size is being used for Bitcoin. Although larger size of block was tried for Bitcoin before, it was stopped due to security reasons. It is also crucial to increase block size for Bitcoin engineers. It has been attempted several times but not be finalized yet [6]. c0ban could be improved so that secure transactions could be done which would be proved by the experiment we have conducted. In conclusion, 4MB is applied for c0ban. It is explained in section of experiments.

B. Block generation interval

A Block on blockchain consists of several transactions. Once the block is authorized, whole transactions stored are authorized as well. Block generation interval is also described as an interval of block authorization. It is ten minutes in general on Bitcoin blockchain. As described, c0ban would be used at cashiers of shops, 30 to 60 seconds are set as block generation interval. Although the adjustment would be extremely difficult, it should be solved for becoming general payment method.

If block generation interval is set from X to Y where $X > Y$, the number of transactions per second could become X/Y times larger.

In conclusion, 32 seconds is selected for c0ban block generation interval. Experiments result will be described later.

C. The number of blocks for authorization

As mentioned, we are seeking for crypto currency which could authorize transfer faster. That is why 32 seconds are chosen for block generation interval. As known, authorization of block chain is not decided by generation interval only. It depends on the number of blocks needed to confirm transaction. The current bitcoin uses 6 blocks which means about one hour for authorization because block generation interval of bitcoin is 10 minutes. one hour is too slow for c0ban usage. On the other hand, 32 seconds is 19 times faster than bitcoin. In terms of final block authorization, we set 15 blocks (= 8 minutes) which means c0ban is 7.5 times faster authorization than bitcoin.

D. Difficulty adjustment

If term of difficulty adjustment is d day(s) and block generation interval is g day(s), the number of blocks generated until the next difficulty adjustment is described as follow.

$$d/g$$

Assume that bitcoin of d and g are d_b and g_b, respectively. Assume that c0ban of d and g are d_c and g_c, respectively. If the below formula is true, we could say we have enough terms for difficulty adjustment.

$$d_c > d_b g_c / g_b$$

Since d_c is 0.74 days where d_b is 14 days, g_b is 10 minutes, and g_c is 32 seconds, 1 day is selected for c0ban difficulty adjustment for further security. By taking further security into consideration, 1 day is chosen for difficulty adjustment for c0ban. Regarding to the number of blocks for authorization and difficulty adjustment, the setting is for the early stage of c0ban. These may be adjusted at right timing in the near future.

E. SegWit (Segregated Witness)

An input field of transaction includes a signature information, called Unlocking-Script, for certifying ownership of the balance, as shown in Table I. The SegWit (Segregated Witness) separates this Unlocking-Script into another data region, called witness.

The field size of Unlocking-Script can be reduced to one-fourth by only storing pointer to the witness instead of storing

TABLE I
DATA STRUCTURE OF INPUTS FIELD OF TRANSACTION (FROM [7])

size	fields	descriptions
32 bytes	Transaction hash	Pointer to the transaction containing UTXO to be spent
4 bytes	Output index	The index number of the UTXO to be spent; first one is 0
1-9 bytes	Unlocking-script size	Unlocking-Script length in bytes, to follow
Varibale	Unlocking-script	A script that fulfills the conditions of the UTXO locking script.
4 bytes	Sequence number	Not in Use

TABLE II
DATA STRUCTURE OF TRANSACTION (FROM [7])

size	fields	descriptions
4 bytes	Version	Specifies which rules are applied to this transaction
1-9 bytes	Input Counter	number of inputs
Variable	Inputs	transaction contents for each input
1-9 bytes	Output Counter	number of outputs
Variable	Outputs	transaction contents for each output
4bytes	Locktime	A unix timestamp or block number

whole Unlocking-Script data. As a result, transaction size is also reduced, so that the number of transactions which are included in a block are increased. SegWit is installed on c0ban and was confirmed that it work well.

F. Hash calculation algorithm

Establishing secure and stable system are the most important requirements. The reason why we take advantage of Bitcoin technologies is its reliability. Drastic modification of Bitcoin should be avoided as it provides safe and stable operation. It is our basic stance.

Regarding to selecting consensus algorithm, we follow the stance. Although *PoS (Proof of Stake)*, *PoC(Proof of Capacity)* or *PoI(Proof of Importance)*, etc are introduced on new crypto currencies recently, those algorithm have not yet achieved stable enough performance. Besides, tremendous labor would be needed to improve source codes despite its uncertainty of stability. *PoW(Proof of Work)* was applied as consensus algorithm for c0ban out of such consideration. Then, selection of hash calculation algorithm has been discussed in our team. As stated earlier, demonstration experiment has been conducted including performance check of hash calculation algorithm.

We basically believe that mining itself does not have any social value other than gaining crypto currency after huge calculation. Since gaining currency such as mining gold should be extremely difficult, mining mechanism of blockchain was invented. It would work for decentralized authorization system very well, however its electricity spending on the mining activities face lack of economic rationality. Electricity consumption would be crucial issues because necessity of nuclear plant for electricity is discussed very actively in Japan since 3.11 in 2011. The future technology of blockchain should be improved as Earth-friendly manner. The points would be considered on c0ban 2.0 described in section VIII. Regarding to hash calculation algorithm for c0ban, the following two hash algorithms are examined.

- SHA256: It is a hash calculation algorithm which is applied on Bitcoin. ASIC(application specific integrated circuit) is already supported. All mining machine will be replaced to ASIC in the near future.
- Ethash: It is a hash calculation algorithm which is applied on Ethereum. It is said that it would be difficult to produce ASIC because of utilizing a large amount of memory. That is why CPU or GPU mining are major now.

In conclusion, SHA256 was selected after discussion for months. Our decision was not made by performance of algorithm. It was made by business and stable operation points of view. We could expect lots of c0ban app users in a short term, hashing power would be needed as much as quickly for stable and secured operation. If new kinds of algorithm is selected, we have to wait for miners who have capability of using the new one. It could become a crucial issue to c0ban business. That is why the most common algorithm, which is SHA256, should be fit for c0ban.

G. Mining

The first 1,000 blocks are used for pre-mining. Although c0ban is a public block chain, block rewards for mining is set zero for the first 739,125th blocks which means 273.7 days $((738,125 block * 32 seconds)/(24 hours * 60 minutes * 60 seconds))$. On the other hand, transaction fee is set from the beginning.

The reason of the algorithm designed is to aim performance stability. We have conducted demonstration experiments for months. We have confirmed its operation check. For its last step, we concluded that performance check should be run on real market inside our highly reliable data center configuration as described in section V. Since it is the first challenge in the world to launch new block chain combined advertisement solution, we have to figure out what revision should be made to update c0ban. Prompt revision should be beneficial to all c0ban users.

After 739,126 blocks, block rewards is set two RYO from 739,126th to 985,500th blocks. Two RYO will be added every 246,375th blocks until rewards become eight RYO. From 1,478,251th blocks, block rewards is set eight RYO towards 9,608,625th block which is the last block with block rewards. Block rewards on c0ban will be terminated sometime in 2025.

As known, block rewards on bitcoin decrease every four years. Its miner can not expect enough rewards from 2020

July which is the next reward halving [13]. Since SHA256 is selected for c0ban, we could expect bitcoin miners could switch to c0ban miners. Their hashing power will make c0ban safety strengthening. We hope that c0ban could be a stable reward platform for miners until 2025.

H. The number of transaction per second

From the whole specifications mentioned in this section, the number of transaction per second could be increased. Ideally speaking, its maximum is 700 transaction per second. It means about 60 million transactions per day. It would be quite enough for our business model. However to achieve the maximum power, a huge number of nodes will be required. The speed is not confirmed on demonstration experiments. As described in section V, transaction speed c0ban would depends on c0band which is a node for transfer transaction to c0ban block chain from our own iDC. Increasing of amount of transaction could be monitored. It has proportional relation with the number of c0ban app or exchange market users. Investment on facility would be proceeded to fit the number of users. Transaction speed needed could be achieved.

IV. Approaches for expansion of C0ban

FOR expansion of c0ban, the following three steps would have been taken place. Firstly, a crowdfunding is used for getting initial c0ban holders and initial funding for developments. Secondly, mobile apps on App Store and Google play would be released to take advantage of expanding user bases. Lastly, c0ban could be able to be exchanged on crypto currency market in each country so that users in each country could be able to exchange c0ban to their local or designated currency.

A. Crowdfunding

The crowdfunding was ended on 30th November 2016. As a result, about 138 million JPY (1.2 million USD) was supported from 841 supporters (https://c0bantrade.com/old/thank in Japanese only). Although it is not the largest one of initial coin offering in crypto currency industries, it is new Japanese record on crowdfunding. Former Japanese record was 106 million JPY by SONY on the website called First Flight crowdfunding for SONY ' s smart watch, wena. We could say that our business model be appealing enough to consumer and corporate users. If including registered only users, total number of c0ban subscribers is more than 2,000 as of December 2016.

Detailed specifications of c0ban is mentioned in the technical details. The total number of c0ban issued is 88 million. Its 25%, which is 22 million, at maximum could be sold as initial coin offering through the crowdfunding. Remaining c0ban from initial coin offering would be purchased by LastRoots Co., Ltd. to take advantage of c0ban promotion services. Supporters on the crowdfunding are restaurant shop owners, beauty salon shop owners, corporations who have a chain store and individual investors etc. Fund gathered through the crowdfunding is used for developments of c0ban blockchain, mobile apps for PR video, mobile apps wallet, system of exchange market. It will also be used for building c0ban technical community and its maintenance network. Both initial users and initial development expenses could be prepared simultaneously by the crowdfunding scheme.

As mentioned on our crowdfunding website, we proceeded to develop the following four projects by the fund supported. Firstly, we have developed block chain c0ban. Secondly, the fund is being used for development of our main services, c0ban apps. Thirdly, we are developing our own coin exchange market for c0ban which will be released on February 2017. Lastly, we could hire our sales team who are exploring shops or corporate for our first c0ban corporate users. LastRoots was set up on June 2nd, 2016. LastRoots is just a start-up without any seed round fund. Thanks for crowdfunding, we were able to proceed development. As of December 20th, 2016, our team became more than 30 members which includes 6 developers in Hanoi, Vietnam as our off-shore development center. Since we have started development on the beginning of June, 2016, all development have been done for only six months. The achievement can not be done without crowdfunding.

B. Expansion by mobile entertainment apps

The issue of crypto currency is expanding holders from limited investors to general mass consumer. Those who hold crypto currency now tend to be traders. In fact, there are lots of Bitcoin holders in China because Chinese day traders began to purchase and sell it after ban of day trading in China.

Although c0ban app is an app which uses blockchain, it could be said that c0ban app is a video viewing app. It is kinds of entertainment apps. C0ban could be promoted as new type of entertainment game apps.

Social game app industry became huge dramatically for the last five years. Its market size in 2015 exceeded 25 billion USD. Japanese social game market is quite large as well. Lots of social game apps have more than 10 million users in Japan. Some apps have more than 50 million users (Population of Japan is 127 million). On the other hand, the number of Bitcoin holders in Japan is estimated less than 10 thousand. It is because there is no entertainment aspect on wallet apps.

Marketing approaches for user expansion on mobile game or entertainment apps such as using legacy TV commercial or remarketing are already established, especially in Japan. For example, the number of TV commercial by social game developers is larger than all automobile companies which are the largest industry in Japan. In spite of that automobile industry is 20 times bigger than social game industry.

The reason why we have now such a big market in social game industry is that developers promote that if users have free time for several minutes, they could have fun even if they are in train. In addition, users tend to purchase items inside apps by being inflamed gambling mind in such a short term.

It would be difficult to achieve user expansion if the app is just a wallet app. But if it is an entertainment app, promotion strategies which social game developers utilize could be applied and it would work very well for expansion. In

Fig. 2. c0ban app top image

addition, c0ban could be promoted that if users have free time for several minutes, they could earn crypto currency instead of spending money on games. Users of c0ban app will earn unconsciously through having fun to watch videos.

Regarding to entertainment aspect of c0ban, brief functions are introduced as followings. 15 seconds or 30 seconds PR video on our app are played repeatedly. It is permanent replay unless users swipe a video to see next one. Between PR videos played repeatedly, there is 1.0 second break of chance to earn c0ban. A button for getting c0ban pop up on videos, which might be changing time to time, if users tap it, c0ban will be provided. The 1.0 second is kind of mini games. Hundreds kinds of such mini games will be prepared. You will find advertisements that consumer eager to watch on c0ban app.

C. Ecosystem of c0ban with market

As stated earlier, business model of c0ban is combination of fintech and advertisements. Not only users but also corporate could have chance to make capital gain through exchange transaction. Our goal of c0ban ecosystem is described as shown in figure 3. Three kinds of players which are users, corporate, and exchange market will be collaborated each other. Ideally, the collaboration can be done without considering boarders. Corporate could be able to approach expecting consumer in any country from their home ground and exchange their c0ban to any currency as well as from any currency to

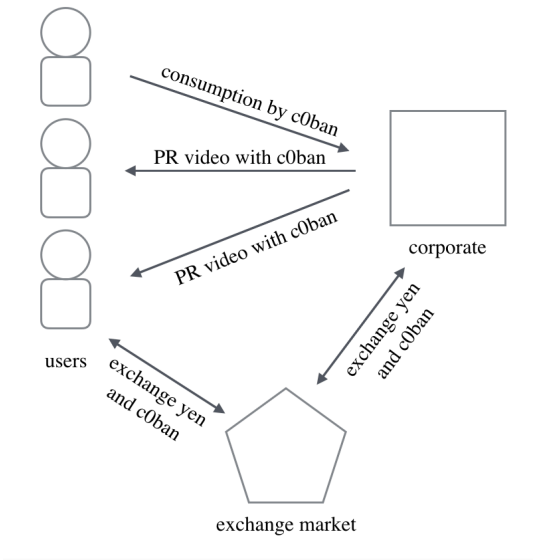

Fig. 3. Ecosystem

c0ban on market. Users can see any PR video as long as the video is broadcasted to their countries and also exchange their c0ban. Although regulations of crypto currency are different in each country, if any transaction without considering boarders can be done, it would be ideal. Both following regulations and pursuing business opportunities will be tackled by our c0ban team as much as possible.

We are now focusing on the following five points for expanding c0ban ecosystem.

1) Sales strategies: Unique features of crypto currency c0ban is combination of advertisement services and block chain from the beginning. We take advantage of micro payment function on our services. We believe that it is the world's first challenge. That is why as many shops or corporate users as possible should be solicited as advertisers before the launch. As described previously, we have been proceeding development c0ban block chain, c0ban apps and c0ban exchange market simultaneously. In addition to that, our sales team are trying to promote our services to shops or corporate users with just broushers and demo-apps. We have negotiate with 3,203 shops as of December 20th, 2016. Although we do not launch our services yet, 613 shops/corporates are very interested in our new concept. Its probability is 19.1%. More than 19% corporates will use our services when launched. We would say that it is amazingly high probability if we take it into consideration that our service is not started yet. One can see that our potential customer expect very much for our new concept of advertisement. We will also release c0ban agency system for exploring corporate clients from the beginning of 2017 not only in Japan but also whole Asia countries.

2) User expansion: We call our business model "Earn to play". This comes from business model of social games called "Free to play". Social game providers always spread abroad their games to users by using mass media promotion. What

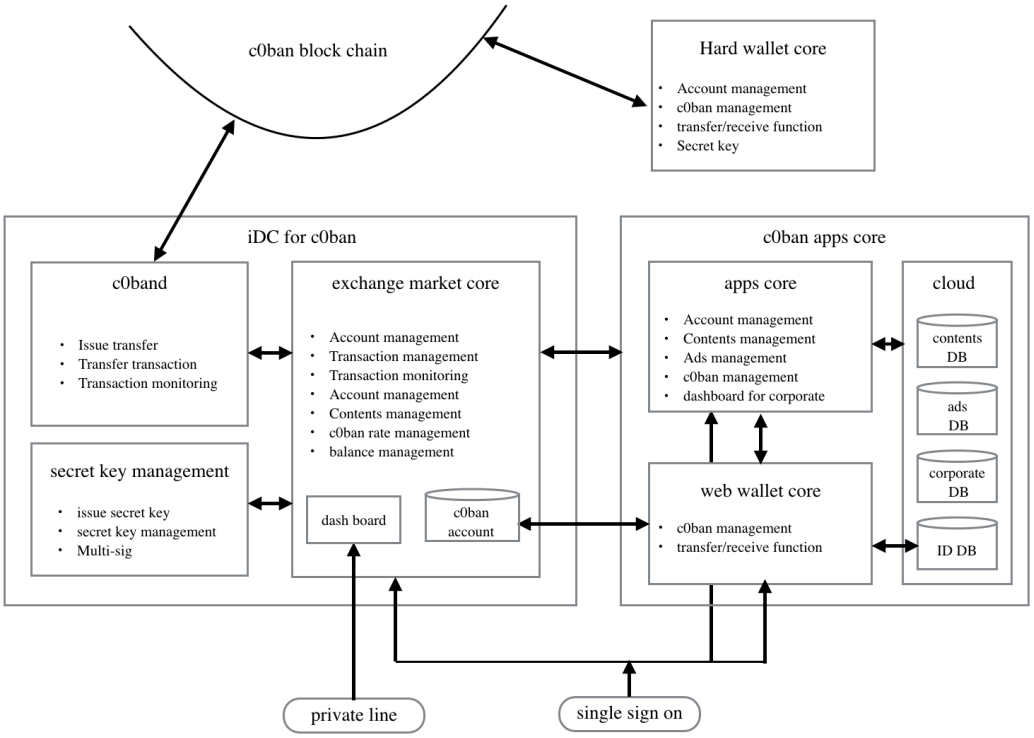

Fig. 4. system configuration of c0ban services

they appeal is free to download and free to play. They try to make users spend money to purchase items inside games by variety of tactics. If users have free time of 5 minutes, users could spend a lot. Their goal is making it as large as possible.

On the other hand, business model of c0ban is that users could earn if they have 5-minute free time. They could earn by just viewing PR videos firstly, then they could enjoy c0ban later by using it to purchase something. It could be a main key driver to make users motivate to play c0ban. That is why we call it ”Earn to play”.

3) Expenses for advertisements: Stable and enough large amount of transactions on crypto currency is what almost all crypto currency providers have been seeking for. If we have only exchange market of crypto currency, it would be difficult to make it spread to mass market. But our business combines crypto currency and advertisements. Once our corporate clients consider c0ban model works well for their promotion, they will begin to use c0ban constantly instead of investing on legacy advertisements. Market size of Internet advertisements in Japan, 2015 is about 1 trillion yen (= 10 billion USD). Video advertisements on Internet became very large rapidly and its size will become about 300 billion yen (= 3 billion USD) in 2016, Japan. While you are watching videos, when you see video ads on the video you are about to watch, even if you click X to delete the ads, advertisers have to pay promotion fee for that. One can not see that it would be enough efficient. The target of c0ban business is to replace such legacy methods.

4) Hot market for traders: One of the main motivation for crypto currency holders is that they expect prices rises as bitcoin has been so far. From c0ban business point of view, if many traders are eager to buy c0ban, it would be really good effect for c0ban advertisement model. Our main goal is destruction and creation of advertisement market. Support from traders would help very well for new creation because phenomenon such as many traders are looking for getting c0ban will affect consumer so that they begin to consider to get and use c0ban. We could see such movement from behavioral economics.

5) Commodity service method: One can forget new services very easily unless it is commodity service method. Payment solution itself is fundamental and very commodity services. Lots of users and lots of place where new payment method can be used are needed to be commodity. That is why it might be one of the most difficult industries for startups. But that is why startups should try its destruction and creation.

V. System configuration of c0ban services

We have examined more than 10 system configurations before we finalized it as shown in figure.4. What we look for is the following three. Firstly, smooth apps usability. Secondly, single sign on whole c0ban related services. Lastly, achieving highly secured system.

In terms of smooth usability of apps, users can access lots of PR videos from our corporate clients and c0ban web wallet on the same app. One point of view, c0ban is just a

simple video viewer or a simple game app. We have to avoid difficult UI because most of our users are not familiar with crypto currency. They do not know how to use crypto currency wallet because it is quite complicated. They just want to see interesting videos on our apps.

Secondly, users can use the same account to sign in any our service including c0ban apps for advertisement and entertainment services, c0ban exchange market, and wallet function. We have developed single sign on for these purposes. Users can trade their c0ban they earn on our app at our exchange market. Account information and c0ban balance on apps and exchange market can be managed by the same account. It is one of the most important feature. It is also most difficult part to develop.

Lastly, achieving extremely high level of security. Especially, management of secret keys would be one of the most crucial point. Quite highly security management of keys is designed in our own data center (iDC) described in detail later.

As a result, our system consists of 8 components which are 1) c0ban app core, 2) web wallet core, 3) cloud DB, 4) exchange market core, 5) c0band, 6) secret key management server, 7) hard wallet core and 8) c0ban block chain.

A feature of the configuration is c0band which is installed in our own iDC. Role of c0ban is that all transaction from not only exchange market but also from apps will be done through c0band in iDC under secret keys managed by independent servers inside the same iDC. As a matter of course, RAID structures are applied on all system in iDC.

On c0ban app, we applied cloud DB so that we could handle rapid increase of users. Since cloud servers are very flexible, we could adjust easily. However if we manage secret keys on cloud servers to access c0ban block chain, it would be very difficult to keep secured system. It could not be chosen. As described in figure. 4, c0ban app access c0ban block chain through c0band and secret keys in iDC.

In terms of c0ban account, all users will have two accounts information on one ID. One is inside c0ban apps, the other one is on c0ban exchange market. It is similar structure with your wallet (c0ban apps) and your banking account (account on exchange market). If you assume that your balance of c0ban apps is coins inside your wallet, it is easy to understand.

Since c0ban block chain itself is designed based on bitcoin block chain, c0ban could be reliable as long as hashing power is enough big. To access the block chain from exchange market or c0ban apps must be taken care because it is such as open c0ban block chain from outside. The access must be controlled and monitored strictly. Our system configuration was designed from this point of view. As described in section III, we have tried to speed up c0ban to fit our business model from bitcoin. However its speed depends on speed of c0band in our system. Next issue is to find how to accelerate c0band for transferring transaction without compromising whole system security.

VI. Demonstration experiments

The following experiments has been conducted. Whole concerns discussed in this paper cause by block size, block generation interval and the number of block which required to confirm a blockchain may not lead fork, defined connection blocks. To ensure security on c0ban, demonstration experiments by using parameters of Table III was selected.

TABLE III
Demonstration experiment conducted

Parameter name	Parmeter set
Block size	4MB or 8MB
Block generation interval	16, 32 or 64 seconds
Connection blocks	15 blocks

In addition to that, transaction speed depends on performance of c0band which operates securely in our iDC. Initial target of experiments was to check performance of c0ban block chain itself. Its capabilities of transaction on block chain could be expected. Our focus of experiments was shifted to figure out performance of c0band whether power of transferring transaction from it could be speed up based on the size of c0band facility. We have conducted to see its power under several environment by using Intel® Core™ i7 class CPU. As described in figure 5, performance of c0band has proportional relation with its size of facilities. It could be speeded up by investing on facility as we gather new users.

In conclusion, the following parameters are selected for c0ban; block size : 4MB, block generation interval : 32 seconds, the number of block which required to confirm a block chain : 15.

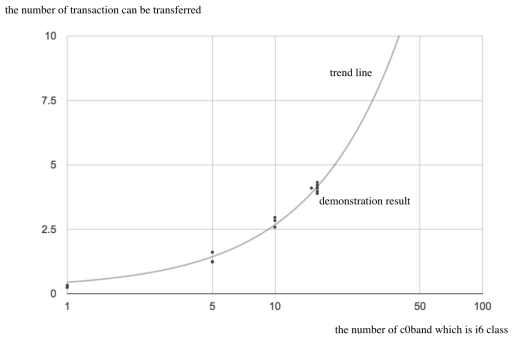

Fig. 5. Demonstration experiments

VII. Next update scope for c0ban

C0BAN was just launched on December 2016. As described, the block chain will be used for advertisement and entertainment services. Meanwhile, exchange will be actively as well. To keep security level, we have to add nodes and c0band as many as possible to increase total hashing power.

As known, the more hashing power, the more secured. On the early stage of c0ban, users will use it for their advertisements. Most transaction will be done via our c0band in iDC securly. We assume that the number of users is hundred thousand. C0band is already installed so that those users

can proceed transactions smoothly. Our goal is to expand to hundreds millions users. The current facility is not enough.

Although huge attention has been paid on block chain or crypto currency, it is very difficult to find crypto currency users in common. We do not have any accurate statics but we do not have 50 thousand users in Japan. It is still very small community. That is why c0ban focuses on advertisement and entertainment first to increase users as fast as possible. Once lots of users use c0ban on their everyday life, P2P payment transaction will be active. Aggregation nodes will be prepared before that.

We do look for more nodes and more aggregation nodes. To increase total hashing power quickly, SHA256 is selected. We could expect lots of miner in the world who use SHA256 for bitcoin. Mining reward for bitcoin now became small. It does not meet return on investment. Most of them are looking for other options. We believe that c0ban could take the place. Since block rewards will be issued constantly until 2025, c0ban would be one of the best crypto currency for miners in the world.

VIII. C0BAN 2.0

C0BAN 2.0 is also designed simultaneously for our further business scope. As stated in section III-F, mining activities are faced with lack of economic rationality from the viewpoint of electricity consumption and occupancy of calculation resources. The calculation power should be utilized for solving issues of human being.

For example, a crypt currency Ripple was used to take advantage of grid computing collaborated with NGO called *World Community Grid* [10]. Token of crypto currency called XRP was rewarded based on contribution. Although it is still an idea, calculation power should be delivered for reducing electricity consumption, analysis of planet search for future of humanity, or extremely huge software testing for highly reliable system [3].

Our challenge on c0ban 2.0 would be solving issues of mankind and setting on the blockchain based technology in parallel. Being ideally, it has been concerned that the following theme could be done only on P2P decentralized network. It is decision making of problem for mining calculation, evaluation of contribution, reward program based on performance.

IX. Conclusion

We believe that c0ban is the world's first crypto currency tied up with entertainment and advertisement services from the beginning. In addition, as stated, c0ban 2.0 is being designed simultaneously for further usage. The ultimate goal of c0ban is to get millions of users through entertainment PR videos. Once millions of users hold crypto currency c0ban, variety of applications could be installed on c0ban 2.0.

It includes social experiment that crypto currency reward by view could make change of consumer behavior and life style or not. In addition, it is wondered that reward across the border could solve poverty issues in emerging countries or not. C0ban is a challenge to trigger destruction and creation of advertisement industry as well as changing life style of viewing video on smartphone and working style of crowdsourcing.

It is not just developing altcoins. Difficulties of our challenge were cooperation among c0ban block chain, c0ban exchange market on iDC, secret keys management on iDC, c0band oniDC, c0ban apps core and cloud DB without compromising high level of security. As shown in table VI of Appendices B, whole system was developed within 6 months. We believe that it could be evaluated it is an astounding achievement. Our engineer team have made it. Meanwhile, our sales team also succeeded to gathering fund for development via crowdfunding and have found more than 600 clients who want to try c0ban promotion method. It would be also high valuation on.

c0ban apps will be released on January 2017 and its exchange market will be released on February 2017. We believe that c0ban could have an impact on society and change the world better through our services. In 2017, several regulation for block chain will be in effect in Japan. We would just follow new rules. What we could do now is just keeping on taking action.

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Appendix A
Specifications of C0BAN

Basic and program specifications of c0ban are shown in Table IV and Table V respectively. These are as of end of September and may be changed.

Appendix B
History of C0BAN development

LastRoots Co., Ltd was set on June 2nd 2016. Only 6 months have passed to develop whole system since founding.

Appendix C
Samurai money, coban

Samurai money is used to be called coban. The first historical coinage in Japan was Wado-kaichin. It was released in 708 A.D. Since then, several governments were established in Kyoto, Nara, and Kamakura. Nothern part and southern part of Japan were kinds of vassal states. No government conquered whole Japan until 1603 A.D. The first one is Tokugawa shogunate (1603 to 1867) which was located in Edo (Tokyo)

and was governed by samurai. For economic growth, united currency system was considered. Coban made of gold was released. The first coban was keicho-coban as shown figure 6. It was estimated more than 14 million coban was distributed from 1601 to 1695. It was considered as a symbol of wealth. That is why we named our crypto currency c0ban. 0 is used instead of o, it is because shape of 0 is more similar to the shape of real coban.

Fig. 6. Appendices C : Keicho coban

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TABLE IV
APPENDICES A : BASIC SPECIFICATIONS OF C0BAN

a	Release date	December, 2016
b	Coin name	c0ban
c	Unit	RYO
d	Unit	mRYO = BU
e	Unit	microRYO = MON
f	minimum Unit	0.00000001 RYO = 1 c0ban (CBN)
g	Consensus algorithm	PoW (Proof of Work)
h	Hash algorithm	SHA256
i	Single signature address format for public key	34-digit starting with “8”
j	Multi signature address format for public key	34-digit starting with “C”
k	Address format for private key	52-digit starting with “M”(WIFC) or 51-digit starting with “5” (WIF)
l	Block generation interval	32 seconds
m	Total amount of c0ban	88,000,000 RYO
n	Amount of c0ban for pre-mining	22,000,000 RYO where the first 1000 blocks are used
o	Amount of c0ban for normal mining	66,000,000 RYO
	others	block generation interval and coinbase (reward for miners) will be determined as normal mining will be finished for 10 years.
p	block reward	0 RYO from block 1,001 to block 739,125
q	block reward	2 RYO from block 739,126 to block 985,500
r	block reward	4 RYO from block 985,501 to block 1,231,875
s	block reward	6 RYO from block 1,231,876 to block 1,478,250
t	block reward	8 RYO from block 1,478,251 to block 9,358,687
u	block reward	4 RYO for block 9,358,688

TABLE V
APPENDICES A : PROGRAM SPECIFICATIONS OF C0BAN

a	Name	c0band, c0ban-qt
b	Port number for P2P connection	3881
c	Port number for RPC	3882
d	Port number for TEST P2P connection	13881
e	Port number for TEST RPC	13882
f	DNS seed configuration	none
g	Initial connection node address	4 (fixed)
h	Magic number	0x6330626e(c0bn)
i	Maximum block size	4MB
j	Transaction compression	SegWit
k	Multilingual support	YES
l	Version number	v0.1.0.0

TABLE VI
APPENDICES B : HISTORY OF C0BAN DEVELOPMENT

June 2nd 2016	Founded LastRoots Co., Ltd.
June 5th 2016	Started to develop block chain c0ban
June 14th 2016	Run press release about c0ban concept
July 21st 2016	Launched crowdfunding for c0ban development
August 1st 2016	Open off-shore development studio in Hanoi, Vietnam and started to develop c0ban app
August 20th 2016	Started to develop c0ban exchange market
September 22nd 2016	Received IBM blue hub award from more than 400 applicants in Fintech summit
September 26th 2016	c0ban white paper v0.1 was released
September 28th 2016	Broke new record of crowdfunding in Japan
October 15th 2016	Finished development of c0ban block chain and started its testing
November 15th 2016	Started to combined test of c0ban block chain, c0ban apps and c0ban exchange market.
November 30th 2016	Finished crowdfunding. Its result is 841 supporters and about 130 million JPY funding
December 5th 2016	Launched pre-sail of c0ban until open of c0ban exchange market
December 17th 2016	Genesis block of c0ban was started
December 17th 2016	c0ban web wallet was released. c0ban explorer was released
December 20th 2016	c0ban white paper v0.2 (this paper) was released
January 2017	c0ban foundation will be set up
January 2017	c0ban apps will be released
February 2017	c0ban exchange market will be released