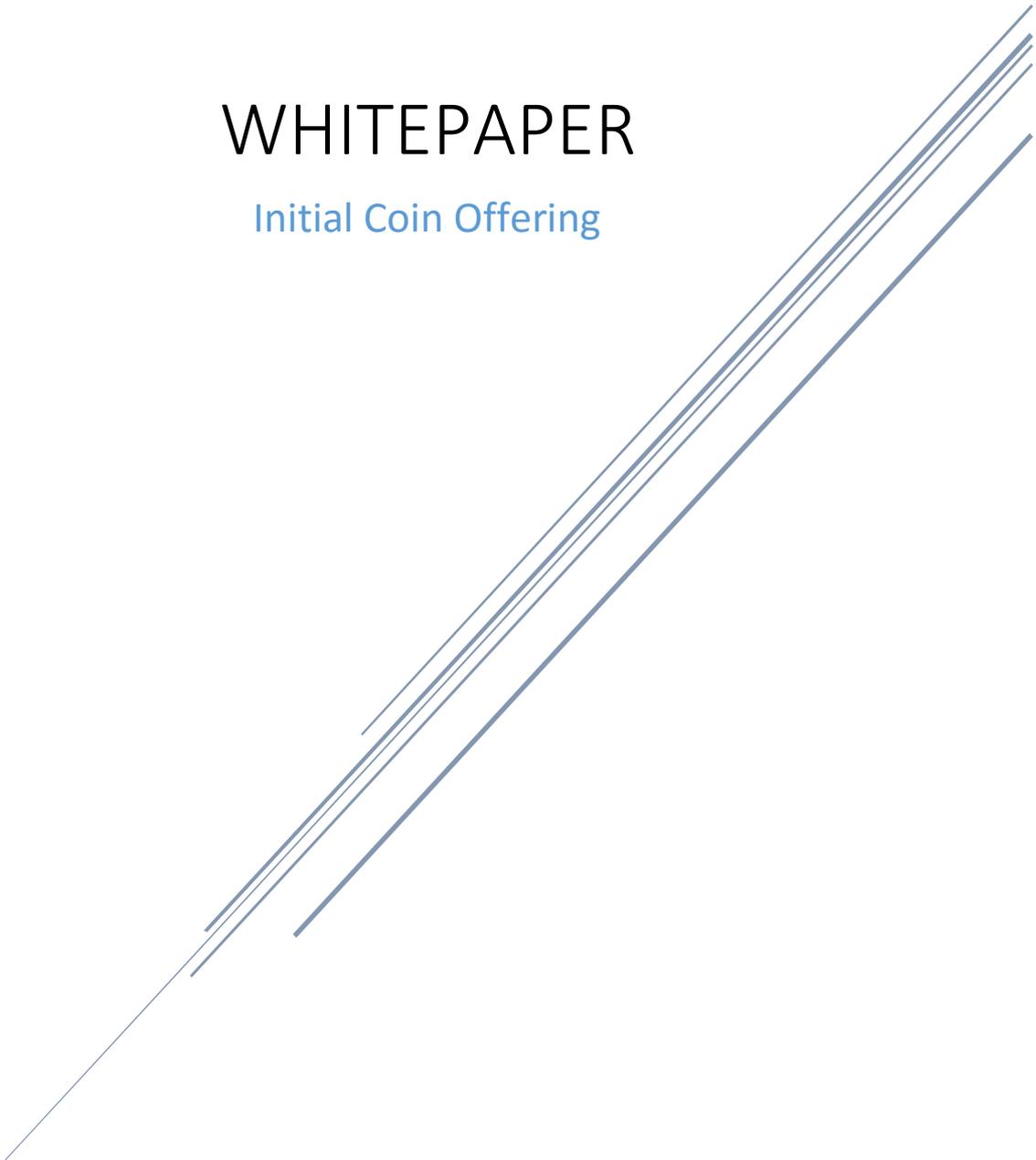




WHITEPAPER

Initial Coin Offering



Version 1.2

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I. Abstract

Crypto Gamble is a cryptocurrency based cloud betting platform, casino and peer-to-peer sports betting site. We act as the technological launching pad that allows regular players as well as gaming companies to create and launch their own casino games. You create the games, we launch them, we promote them. We share the profits with our token holders

The platform enables online players to bet against other online players, where one player acting as the casino is given the house odds. For example, a player is able to open a roulette table, or open a slot machine while other users play against him. The player enjoys the same odds and will profit from the slots and table profits as if he was the casino.

In order to qualify to become the casino operator the player has to purchase and stake Crypto Tokens, play a certain amount of game rounds as a regular player against the Crypto Gamble casino, or against other players who have qualified to become casino operators. In order to create a fair, autonomous cloud-based betting experience for all users, a player cannot remain casino operators forever. For this reason, an additional in-house utility token called “Edge” has been created.

Each time a player plays a round of any of the Crypto Gamble casino games he earns Edge Tokens. After earning a specific amount of tokens he will qualify to “become the casino” and will be able to offer and open games himself which will allow other players to play against him. During the time the player is operating as the casino operator, Edge Tokens will be deducted from his/her account. Once the player fails to maintain the minimum qualifying amount of



Edge tokens required he/she becomes a regular player again, thus creating a profitable ecosystem for both players and the casino house.

II. Trust Problems with Online Gambling

Online gambling typically incorporates similar methods to that of offline gambling, with the traditional setup whereby “the casino” (a regular licensed casino) plays against one or more players. The challenge of gambling, wherein players risk something of value, such as money, for the chance of winning a prize, is usually predicated on the knowledge that a certain risk is inevitable, yet there are reasonable odds for winning. Moreover, players ordinarily demand to know that such odds are maintained by “the casino”, and as such there is a certain trust in the fairness of the casino or house.

The field of online gambling, however, is often suspected or distrusted by players and potential players, for compliance with such standards of honesty and reliability. This is not necessarily owing to a negative history and bad reputation of individual gambling sites, but due to the fact that players are alone, and cannot see the house or the players in the house. In some online casinos there is a multi player feature where players can see other players' hands. What the players can never see or check is the random number generating system or the game engines, and even if these are checked and verified by auditors, there is nothing stopping the casino owners from making changes after the games are audited. As such, despite promises from the house that fairness reigns, this is something which can often not be verified by players.

There is thus a widely recognized need for, and it would be highly advantageous to have, a system that can enable players to become the casino operator themselves and offer guaranteed odds to players on casino games, and such that



users can trust in the odds offered by the “house” and benefit from them, in order to provide users with additional incentive to gamble.

A. The Solution

III. Provable Fairness

Provable fairness is a technology facilitated by both cryptocurrency and blockchain technology that makes it impossible for a player or casino operator to cheat. You no longer have to be suspicious of the house for bets lost. So, whatever game you are playing, you can be confident that the result is fair and accurate given the probable fairness of our gambling platform. Corresponding concepts provide a way for both the operators and players to contribute to randomization, which in turn removes any possibility of deceit or cheating. The foundation of fair gaming algorithms were laid by pseudorandom number generators, utilizing seeds which determine the outcome of wagers. A seed shall be equally influenced by players and hosts, meaning that the result of each bet at a provably fair casino is a team effort. The house is no longer in complete control of randomization.

To prevent malicious behaviour, hosts mustn't show us their actual seed at first. Instead, they present a commitment of their own seed to us. Similarly, to envelopes, commitments seal and conceal messages contained by them. They cannot be altered or revealed without consent from the sender. For example, hosts may commit a seed by using a one-way hash function or public key cryptography. Hosts shall provide transparency and proof of authenticity by revealing their actual seeds at the end of each game. Anyone in possession of a host's commitment may verify the immutability of the corresponding seed. Bets



shall be reproducible once the host seed gets revealed. Players can constantly audit the behaviour of hosts by comparing random results calculated by a host and them.

A. Verifiability of pseudorandom outputs

Pseudorandom number generators provide a sequence of seemingly random outputs initialized by a seed. The presence of an initialization parameter provides the opportunity to use it as a key for verification of results.

- **hostSeed**: Shall be kept in secret until the end of a particular game. Similar to a private key in asymmetrical cryptography.
- **publicSeed**: Players should only generate or contribute to it (with equal amounts of influence) after a commitment (e.g. cryptographic hash) of **hostSeed** has been broadcast to every participant of a particular game.

Broadcasting a commitment of **hostSeed** amongst players not only protects **hostSeed** from being revealed early, but serves as a verification of integrity, proving that during a game, **hostSeed** could not have been tampered without notice.

Using a mix of the entire **hostSeed** and **publicSeed** (e.g. by concatenating them) as an initialization parameter for randomization, every participant may have an influence on the outcome of results, with a negligible chance of manipulation in favor of any entity.

In a peer-to-peer network, every player is also a host, resulting in the presence of multiple **hostSeeds** and **publicSeeds** possibly paired to a **privateKey** and a corresponding **publicKey** for every participant.



B. Initialization cycle

A random hostSeed must be generated to initiate a new game.

- Whether only a single player is betting against the casino, a hostSeed must be generated by the host using a true random number generator.
- If multiple players are betting against the casino, a provably fair seeding event may be used to generate hostSeed.

A provably fair seeding event makes it possible to generate publicSeed using a trustless randomization service (i.e. the hash of a specific upcoming block in the blockchain of a cryptocurrency), disallowing participants to have a direct influence on in-game randomization.

When multiple players participate in a game, hostSeed shall not be generated by a single entity because that would allow a coalition to gain advantage over honest players by whispering hostSeed early to a selected group of participants.

Once hostSeed is revealed outputs generated by the algorithm become reproducible, proving that random results could not have been manipulated in favor of any entity.

C. Properties of a provably fair algorithm

An algorithm behind a game is provably fair if and only if every participant has the same amount of influence on in-game randomization in a verifiable manner. Participants include players and, if present, trustless seeding services. Given a commitment scheme which is computationally infeasible to break.



D. Algorithms

Numerous generic fair algorithms will be used for games which are influenced by randomization, including, but not limited to, rolling a dice and shuffling a deck of cards.

Generating a single random output

The output generation function should be hard to invert in order to protect outputs from being predictable before `hostSeed` is revealed. While any entity in possession of `hostSeed` may predict the outputs of a provably fair algorithm, there should be no concern about fairness until every player has the same amount of information about `hostSeed` during a game.

Generating a sequence of random outputs

When multiple players participate in a game with numerous betting rounds following output generation, a new `publicSeed`, influenced by every player or a trustless service, shall be used before each round in which bets may be placed.

In order to generate multiple outputs using a single set of seeds, a cryptographic nonce should be utilized. A nonce used in provably fair algorithms shall be unique and predictable.

A nonce may only be used once for a particular seed set, and shall be appended to the initial `publicSeed`, producing a unique output for consecutive bets made using the same seeds.

Multiple parameters may be used to construct a nonce if necessary. For example, when shuffling a deck of cards in a turn-based game, nonce should consist of both the round identifier and the shuffle state.



E. Examples

The following functions generate a random integer based on a variant of the practically non-invertible HMAC (hash-based message authentication code) function using *hostSeed* as key and *publicSeed* as message.

The following functions generate a random integer based on a variant of the practically non-invertible HMAC (hash-based message authentication code) function using *hostSeed* as key and *publicSeed* as message.

Algorithm 1; Generating a random integer in the range $[min, max[$
function RandomInt(*hostSeed*, *publicSeed*, *min*, *max*)
 return $min + (HMAC(hostSeed, publicSeed) \bmod (max - min))$
end function

Algorithm 2; Rolling a dice
function RollDice(*hostSeed*, *publicSeed*)
 return RandomInt(*hostSeed*, *publicSeed*, 1, 6)
end function

Generating a sequence of random integers

If multiple random outputs are required throughout a particular game, a *nonce* may be used to produce a sequence of random results. A *nonce* should be concatenated to *publicSeed* using a separator (":").



Algorithm 3; Shuffling an array (Fisher–Yates shuffle [6, 5])

```
function Shuffle(hostSeed, publicSeed, array)  
   $n \leftarrow \text{array.length}$   
  for  $i \leftarrow 0, n - 2$  do  
     $j \leftarrow \text{RandomInt}(\text{hostSeed}, \text{publicSeed} + "$   
       $:" + i, i, n)$  Swap(array[i], array[j])  
  end for  
end function
```

IV. Cryptocurrencies and Online Casinos - a Perfect Match

The inception and creation of cryptocurrencies is tightly connected with the popularization of the internet.

- The first cryptocurrency was introduced in 1998
- In 2009 Bitcoin was introduced, by a person using the pseudonym Satoshi Nakamoto. Bitcoin was the first decentralized currency and it used the Secure Hash Algorithm 2 as POW function
- Two years later, in 2011 Namecoin and Litecoin were introduced
- Today there are over 700 different cryptocurrencies and cryptocurrency trade is legal in most of the countries in the world.

Even though cryptocurrencies first appeared towards the end of the previous millennium, the idea of virtually conducted payments has existed long before that. The first cheques were issued as early as the 70s of the 18th century and many think that this is the ‘root’ from which cryptocurrencies later ‘grew’.



Others name a more recent date. The ‘sprout’, according to them, is the introduction of POS transactions back in 1980, which motivated developers and financial experts to broaden their horizons and it ultimately led to the development of cryptocurrencies. Either way, cryptocurrencies in their modern form have been around for almost 20 years. The past 5 years were a period of a major expansion.

A. Advantages of Online Casinos and Cryptocurrencies

These are the advantages of online casinos:

- Online gambling is much more convenient as players do not need to leave their home
- It is possible to play for free before playing for real money
- Multitude of payment methods are accepted
- There are more available games
- Players can register an account with multiple operators and see which casino is the best one for them.

These are the advantages of cryptocurrencies:

- Cryptocurrencies cannot be counterfeited in the way which credit cards and banknotes can
- Transactions are carried out immediately, whereas with some traditional methods players would have to wait for longer periods before the amount appears in their account
- Cryptocurrency transactions generally include lower fees compared to traditional transactions
- Everyone with an internet access can take part in cryptocurrency trading

- 
- The identity of the user is protected as no sensitive information is required to complete a cryptocurrency transaction.

V. Cloud Betting Explained

The Crypto Gamble platform enables online players to bet against other online players using cryptocurrencies, where one player acting as the casino is given the house odds. For example, “USER A” is able to open a roulette table, or open a slot machine while other users play against him/her. The player enjoys the same odds

In order to qualify to become "the casino" “USER A” has to purchase and stake Crypto Tokens, play a certain amount of game rounds as a regular player against the Crypto Gamble casino, or against other players who have qualified to become the

After earning a specific amount of tokens “USER A” will qualify to become the casino operator and will be able to offer and open games himself/herself which will allow other players to play against him/her. The player has access to various game customization options, such as setting the house “edge” % for each individual casino game he/she creates.

As an example we can take a look at **Poker**:

For cash games:

- 
1. Take a 5-20% rake from each pot up to a certain cap, (i.e) \$5-10
 2. Collect a fixed charge every half hour which could be \$5-15, depending on stakes.

For tournaments:

1. You can set a tournament fee, for example an 80/20% split, where 20% goes to you as the casino operator.
2. Receive a certain % of the buy-in amount. Following that, you will only have to pay Crypto Gamble a commission for operating, maintaining and administering the

When a regular player plays against Crypto Gamble he/she doesn't have to pay a commission, but when he/she plays against other qualifying players who became the casino operator then he/she or the qualifying player will have to pay Crypto Gamble

Players who have qualified to become the casino operator will be prepared to pay these commissions since they will be enjoying and benefiting from improved "house" odds. Playing players will be prepared to pay these commissions since the Crypto Gamble casino will offer more Edge Tokens when players play against each other, which means that players who have the desire to become the casino



VI. Become The Casino

There are two alternative ways of how a user can qualify to become the casino operator.

A. “Edge” Token Integration

In order to create a fair, autonomous cloud-based betting experience for all users, a player cannot remain the casino operator forever. For this reason, an additional token called “Edge” has been created.

“Edge” is an in-house utility token (or credit token) that can also be used as a unit of exchange between players at Crypto Gamble. Each time a player plays a round of

any of the Crypto Gamble casino games he/she earns Edge Tokens. After earning a

specific amount of tokens he/she will qualify to become the casino operator and will be able to offer and open games himself/herself which will allow other players to play against him/her. During the time the player is operating as the players' winnings or losses while a player is operating as a player or as the casino.

Once the player fails to maintain the minimum qualifying amount of Edge tokens required he/she becomes a regular player again, thus creating a profitable ecosystem for both players and the casino house. This method requires the user



to “stake” tokens or put up capital which in part/or fully will be used in paying out winnings to casino players at Crypto Gamble.

B. Crypto Marketplace

Crypto Gamble provides a completely new online casino experience by not only offering your favorite online casino games and sports betting but by taking your ordinary online casino experience up a notch with our unmatched brand-new auctions system. Using the Scala Framework we’ve created a whole new system for game creators and casino providers while delivering a high productivity development environment, and seamless production deployment experience.

We call it – “Crypto Marketplace”.

The system allows game creators to set their budget and submit bids in the form of ad space on the Crypto Gamble platform/website. Once offers are available, creators can bid. This enables casino operators to post ad space on Crypto Gamble

where they set the price in *BTC, BCH, ETH, ETC, LTC* or *Crypto* Tokens while

users can click to place bids or make instant purchases at the price set by the casino. When you host any game as the casino operator you will be able to place bids in auctions. This gives users the opportunity to deploy their games on the most advantageous online casino website available, based on traffic and profitability. Crypto Marketplace is available 24/7, and allows creators the opportunity to sell ad space to new customers that they otherwise would not be games with Crypto Gamble.



Crypto Gamble will charge a commission as a percentage (1-1.5%) of the game turnover

between the players for transactions when Crypto Gamble is not the house. In this case

all “Jackpots” will be maintained and paid by Crypto Gamble. Making this by

The auction system is the sum of 5 micro-services and a web gateway:

Auction Service: Manages the description and auction status (created, completed, cancelled).

Bidding service: Manages bids.

Search service: Handles auction searching.

Transaction service: Handles the transaction of negotiating delivery info and making payment.

User service: a convenience service to stub user management.

Web-gateway: an application providing web UI and acting as gateway to all previously described services.

C. Risk Control

Qualifying players will have the ability to place stop losses on their accounts in order to protect their capital and limit their potential losses. The user has the option to set a certain limit or “maximum loss” level at which point if hit, he stops operating as “the casino”. Similarly, the user may place other conditions like “*Stop operating as the casino operator once “X” amount of Crypto has been won*”.



D. Crypto Tokens (CRGA)

The platform is powered by an Ethereum-based ERC20 protocol token called “Crypto” guaranteeing absolute casino transparency. In order to qualify to become

the casino operator a player will have to purchase and stake a minimum amount of Crypto Tokens into his account at Crypto Gamble. Depending on the game different

amounts of Crypto will be required. There is no way to host games within the Crypto Gamble platform as the casino operator without first owning and staking Crypto

Tokens. Users will be encouraged to transact with Crypto as this will offer many

benefits within the platform such as bonuses, and higher payouts.



VII. Brand Highlights

Crypto Gamble promises a flawless, provably fair gambling experience. The website will be compatible for online and mobile, and will be active 24 hours, seven days a week to serve a global market. Customer loyalty program offers will reward both new and loyal customers. Customer care and technical support will be

We position ourselves as a customer-centric business, which is why our offer and infrastructure will be user-friendly. The website will simulate the interactive



casino environment while simultaneously providing a level of convenience and privacy not offered by regular fiat based casinos. Our customers will be able to engage in casino games, all from the comfort of their homes, offices, or anywhere else in the world.

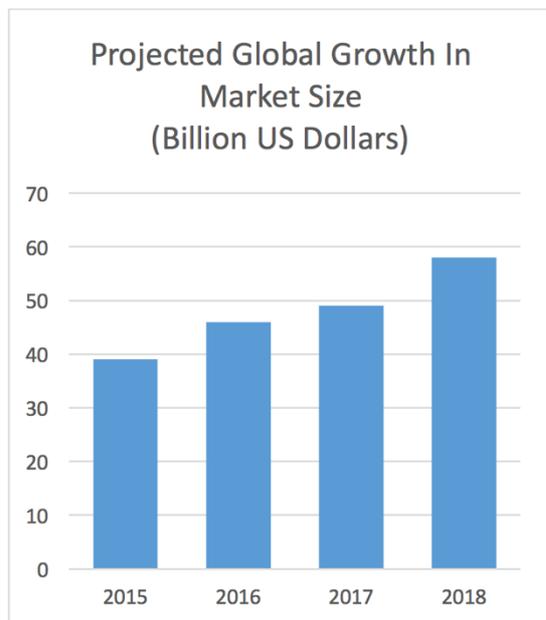
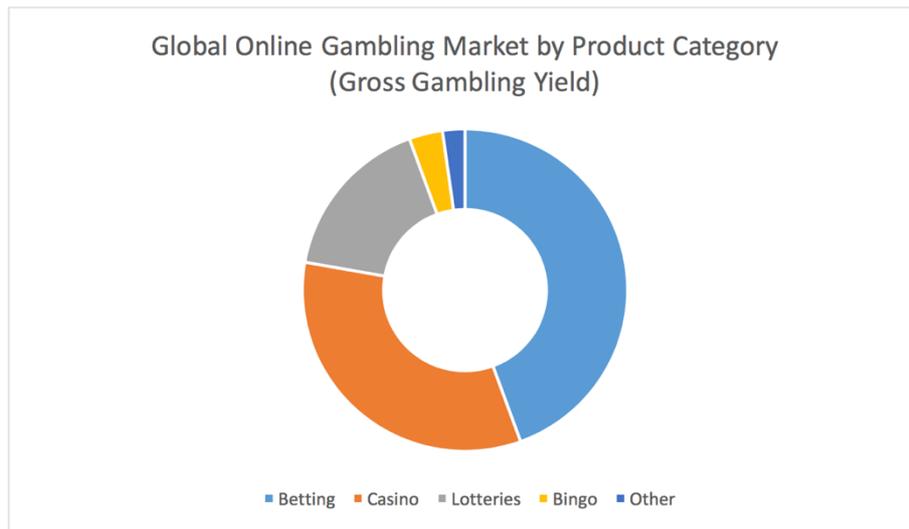
Cryptocurrency wallets are anonymous, and our casino will not require any log-ins or registrations, thereby providing absolute anonymity. Instant and cost-effective cryptocurrency transfers will provide instant money deposits and withdraws for the customer, while regular casinos hold your money for 1 - 3 days before remitting it to you.

Qualified users will be able to become casino operators and create their own games and rules within the online casino. They will gain the “house” odds and will be able to profit as if they were the casino. This is a powerful advantage against other online/Bitcoin casinos and an industry first, which we believe will become the industry standard in the near future. Crypto Gamble plans to claim its “first mover” advantage over other online casinos and in doing so establishing itself as

A. The Market Opportunity

Online gambling takes place legally across **85 nations worldwide**, with Europe alone owning a revenue share of \$15 billion. The global market is worth over **\$50 billion** per annum and is expected to achieve a compound annual growth rate of between 11 and 16 percent between 2017 and 2020. Furthermore, this market no longer consists only of the stereotypical middle-aged, middle-class man. Males between the ages of 18 and 35 remain the dominant market, but young men and women, and lower to middle and upper-income classes, are increasingly

becoming active players in the gambling arena.



Of the total global gambling market, online gambling comprises only 9%. And of this percentage casino type gambling comprises 30% of the product share. But this is a nearly \$50-billion-dollar industry, and there is high growth forecasted for this online industry over the coming years, especially as deregulation increases around the globe. So capturing even a small percentage if this global market

could mean large profits

At least 50% of the world's population participates in some form of gambling each year. The social gambling share of total global online gambling is 5%, and



in the United States is 10%. Without the limits of regulations, social gambling is forecasted to flourish in regions where real-money gambling is legal.

This market creates promising opportunities for companies such as Crypto Gamble. Our key differentiators will ensure that customers continue to choose Crypto Gamble over

B. Business model

Our Business Model

- Addressed to young and middle-aged men and women
- 24-hour, 365 days a year customer care
- User-friendly desktop and mobile website
- Mobile applications
- Aggressive marketing through all social channels

Our website will appropriately highlight and market our promotional offers, loyalty programs and the specifics of our business. We will use our unique key differentiators to gain a large initial customer base, and we will leverage online advertising and word-of-mouth publicity to secure our position in the market. Through partnerships with trusted service providers and industry professionals, we will impress customers with a quick-to-load and user-friendly website.



Our Key Differentiators

- Cloud-based betting allowing our users to become “the casino”
- Cryptocurrency based
- Simulated interactive and engaged casino environment
- Security, anonymity and convenience
- First-Mover Advantage

C. Offering



Upon launch of the full platform, Crypto Gamble will include peer-to-peer sports betting, the most commonly played casino games, including a variety of the slot games, favorite table games such as Poker, Black Jack, and Roulette, as well as a live casino environment is simulated for the

customer. Studies have found that the majority of gamblers still gravitate towards brick and mortar casinos, despite the availability of online gambling, and the primary reason is the interactive environment offered by these



traditional casinos. The live casino module will bring the casino feel to the homes of customers. The proportion of slots, tables, and live casino are based on a current market share by product category globally.

D. Growth Opportunities

There are many growth opportunities for Crypto Gamble. First and foremost, we will

launch our services globally utilizing various marketing strategies. Crypto Gamble will

build a solid customer base in its first year that it can use to leverage growth in succeeding years. At first Crypto Gamble will target users in the cryptocurrency

gambling space by optimizing its multiple marketing initiatives and leveraging its key differentiators.

We expect to be able to expand our business in terms of a global fiat customer base through loyalty programs, promotional bonuses, and word-of-mouth. We will keep in touch with our customers through social media and direct

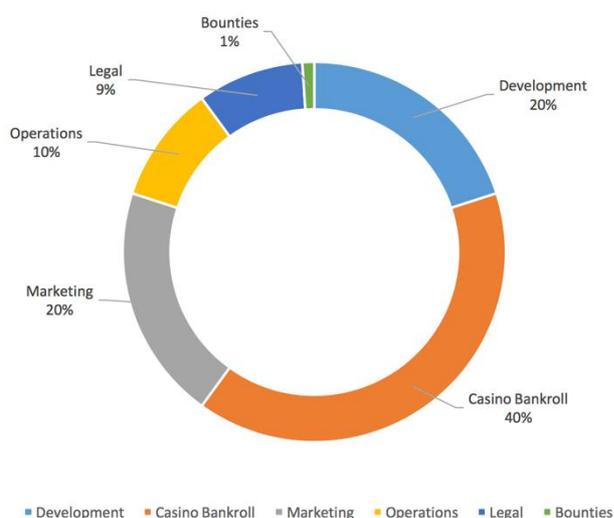
E. Legal business entity

At Crypto Gamble, we are constantly observing laws, rules and regulations for online

gambling. Before we launch the full version of our product, we will obtain a casino license which includes; certified RNG mechanism by legal authorities, strict terms and conditions, responsible gambling information, account

registration as well as other needed requirements to fit into a legal framework. In this way, we support legal and responsible gambling.

F. Use of ICO Proceeds



We're aiming to raise 4072 ETH to pursue our developmental strategy. Following the crowd-sale 40% of the funds raised will be used to fund the Crypto Casino house bankroll. The remaining funds will be split between development, marketing,

bounties, establishing a legal entity, hiring new talent, operation costs and brand expansion. The structure of proceeds utilization is designed to ensure the platform's profitability in the long run with minimal operational risks. Crypto Gamble

is committed to implementing its strategy in the best interest of Crypto Token

holders.