



ETHERACE

v1.0.1



La partie Ether d'EtherAce a été choisie parce que notre plateforme est construite sur le réseau Ethereum. Cela signifie qu'Ethereum est une partie très importante de notre plateforme. C'est pourquoi nous croyons que l'éther dérivé de l'éthéréum, appartient à notre nom. La partie Ace d'EtherAce représente quelques idées différentes. La définition d'un as est quelqu'un qui excelle dans un sport particulier ou une autre activité. Le mot Ace est équivalent à des mots tels que " excellent ", " habile ", " habile ", " magistral ", et champion'. L'idée plus petite des deux principaux est tirée de notre suite de jeux de hasard, où notre thème principal est le jeu de cartes. L'As est considéré comme la carte la plus haute et la plus puissante de tout le jeu. L'idée plus grande vient de notre marché des produits dérivés. Être un as sur notre marché des dérivés représente le trader au comptant et le pronostiqueur de marché, tirant profit de leurs compétences en matière de trading et d'analyse. C'est ce que les utilisateurs de notre plateforme s'efforceront d'être, que ce soit sur le marché des suites de jeux de hasard ou sur le marché des produits dérivés. Enfin, pour la troisième section de notre plateforme, le token ACED, notre vision est que quiconque fait partie de notre communauté est un As, parce qu'ils seront les vrais gagnants des paris sur la plateforme EtherAce.

Notre logo représente deux flèches, qui montent et descendent. Encore une fois, il y a une combinaison de raisons différentes. Notre MVP pour le jeu de suite de la première chance aide à illustrer l'un d'entre eux. Les joueurs ont l'option d'essayer de retourner une carte sur ou sous la carte qu'ils choisissent, mais il est important de noter que tous les jeux ne suivront pas un modèle sur/sous la carte. Pour notre marché des produits dérivés, les doubles flèches symbolisent une fois de plus les paris sur ou sous, car ce sont les deux options que les utilisateurs auront à leur disposition, de la même façon que d'aller en position longue ou courte, et d'acheter ou de vendre. La troisième idée principale est que les flèches symbolisent les utilisateurs et la communauté peut bénéficier de la plateforme EtherAce, que le marché soit à la hausse ou à la baisse. Soit en participant à notre suite de jeux de hasard ou au marché des produits dérivés, qui prend en charge la fonctionnalité de couverture et bien plus encore. Ou en faisant partie de la communauté et en détenant le token ACED, principalement en raison de la baisse des frais, des dividendes et des revenus passifs qu'il offre.



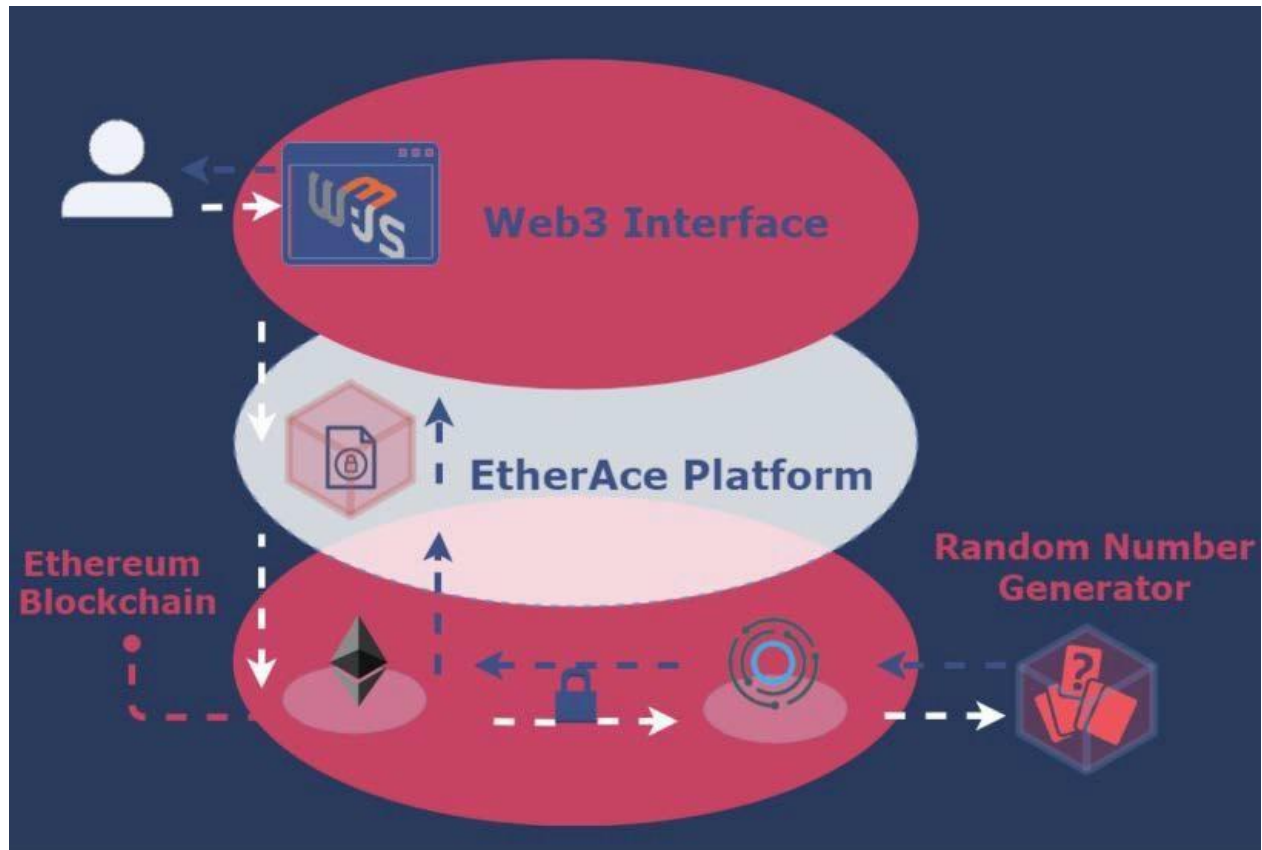
The goal of our chance game suite is to give our users different options and fun new experiences. We aim for all our games to share the qualities of being trustless, decentralized and provably-fair. Most games that are made will follow the theme of using playing-cards. This gives up many different choices and allows us to be creative when implementing new games. We understand that players will want functionality they are comfortable and familiar with, therefore we will design games in a way which provide this. The advantage of using playing-cards as mentioned before are the many different options. There are the regular casino card games. There are also many card games that exist that have not yet been brought to the cryptocurrency sector which we want too.

Although EtherAce's first game requires a bankroll, the focus in the future will be developing more peer-to-peer games. This is because it is much less capital intensive and lightweight than a player-to-platform game. This is because there is no bankroll required, and platform profit is generated from service fees. Our first game is not peer-to-peer because they require users to play each other, and it would be more challenging to attract users to the gambling aspect of our platform immediately without any prelude. Also, our first game is functionally similar to an existing favored cryptocurrency gambling game which will be more inviting for users to come try out.

EtherAce's first gambling game, Flip, lets players place bets using Ether on the result of flipping a card from a standard 52-card shuffled playing deck. We are the first to implement this style of game. Our vision is to give players a new user experience contrary to the many dice sites yet keep the same underlying functionality that they enjoy. Players can choose their own odds with features implemented in our user interface as well as pick between different game settings. Currently there are four different options. Players can choose between 'Over', 'Under', 'Bet on Black' or 'Bet on Red' (these are further described in the *User Experience* section). Upon winning players are paid out instantly (or when the next block of the Ethereum blockchain is processed). There are no player deposits or sign-ups, to make the process for the user more convenient. Every bet is stored onto the blockchain, leading to complete transparency and an autonomous cycle, run by our smart contracts that exist on the Ethereum blockchain.

Further development of the chance game suite and Flip are discussed in **Future Iterations**.

You can currently try out our first game Flip [here](#) on the Ethereum Kovan testnet or go to our websites home page and click 'BETA FLIP DAPP'.



High level example of the flow of control of the first feature implemented in our chance games (on Kovan testnet now!)



A derivatives market must have certain characteristics to be supported. Sufficient price volatility, continuous price risk exposure, market participants with competing price goals, and a quantifiable underlying basic commodity. EtherAce's speculation options will act functionally the same of those of a derivatives market. Sufficient price volatility and price risk exposure apply to the majority of cryptocurrencies that exist today. This sector has many market participants with competing price goals. The volumes on the several existing trading exchanges help show this as well as many other signals. Several cryptocurrencies are considered to be a quantifiable basic commodity, as a majority of them are traded on exchanges as a quantifiable basic commodity.

This means we will have the ability to create a derivatives market on our platform using cryptocurrencies as the underlying assets that are being traded on. Different features will be built and incorporated to provide this functionality and environment. Currently there are no decentralized derivatives markets for cryptocurrencies and we aim to be the first. Similar to the idea of multiple chance games, there will be multiple speculation options. Our first speculation feature is discussed below in more detail. Some of the different options will build on each other, through developing iterations, some will remain separate. A true market will emerge on the platform in early Q1 2019 made up of features like our trading/liquidation engine, future and perpetual contracts, 1-to-n state channels and smaller features like stop-triggers etc. There will be various features that users of our platform can take advantage of some the same as features in the derivatives market but some not the exact same. An example is our first contract, O/U. While the focus is explaining why cryptocurrencies can be used as underlying assets our market will also be supporting speculation on traditional assets such as gold or oil. This traditional world market has already proven itself as the worlds biggest financial market. In the short-term, we will focus on crypto options, however the greater market potential lies within more common assets.

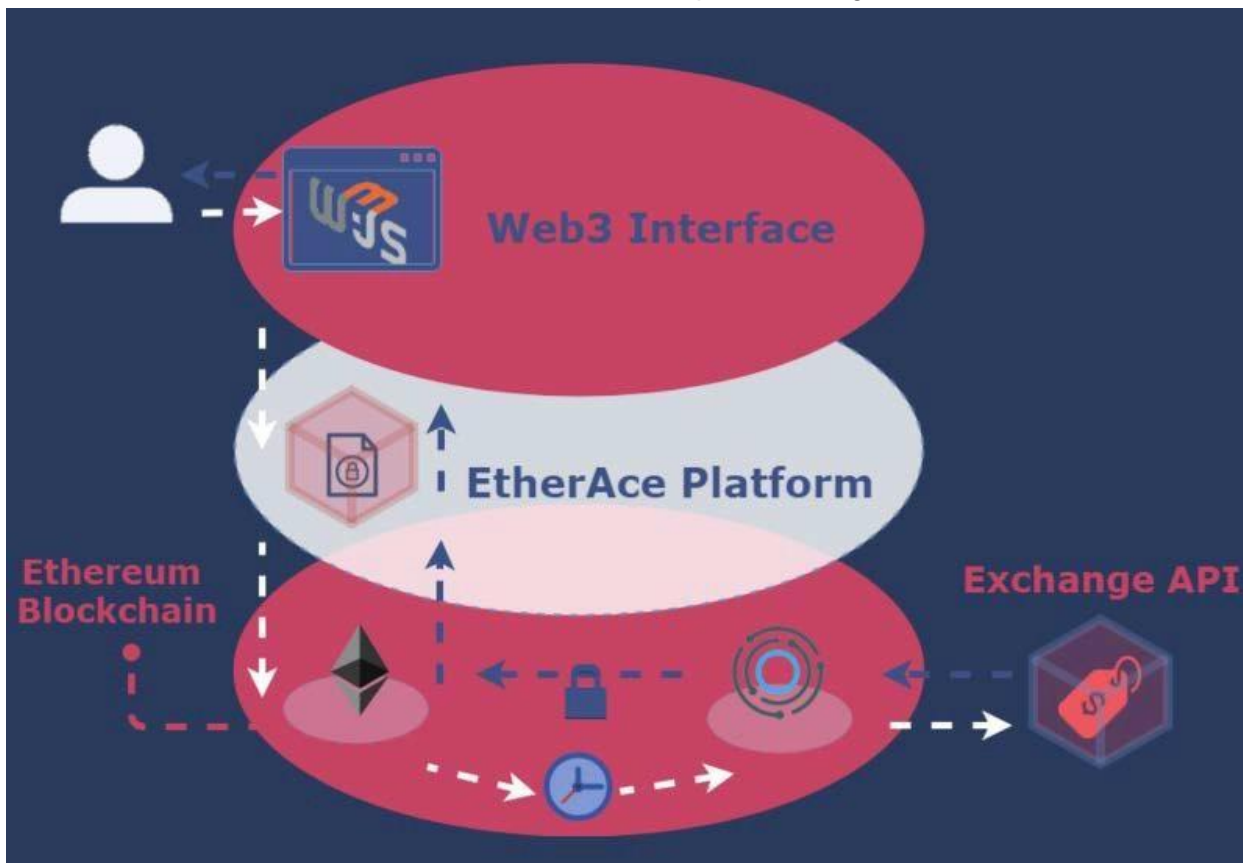
The first feature of our speculation market will enable users to create contracts functionally similar to a futures contract where they can set their own price of any assets or tokens supported by the EtherAce platform and choose between two options, **over** or **under**, like going long or short. Creating a contract lets the user choose the setting of three components. How long the contract is open to other users to join, how long the contention of the price lasts, and the initial price. Enabling users to create their own contracts has many advantages. This can be thought of as the same concept used in a derivatives market where users are either a 'maker' or a 'taker'. Makers, or in our case contract setters, supply liquidity to the market or application. In our case as reward they get the advantage of setting the different factors of the contract and deciding the strike price used, rather than conforming to someone else's contract. There is a limited amount of settings for contracts in terms of time to prevent users from making a contract slightly different from an existing one, and to encourage users to engage with each other. An advantage to user-generated contracts is giving the power to the user, rather than the supplier. Users can factor in different events that are taking place in the cryptocurrency space and can generate pools and bets whenever they wish to, rather than wait for the supplier to. This helps lead to true decentralization because a smart contract could not factor in events or know when users wish to bet for what duration on which coin, without intervention. It truly gives users the power. All bets are



placed using Ether and are paid out in Ether. You win if you bet on the correct option (between over and under). The user wins Ether from anyone who bets opposite of them in the same contract. Profit is decided by our percentage algorithm which rewards users by the amount they bet.

In a situation where the price is the exact same as the strike price, there are three options. EtherAce could keep all the Ether bet, refund all participants, or wait a random duration of time and call the price again to resolve it. This is a great example of something EtherAce would like to hear and take the communities opinion into consideration. There is more on that in the **ACED Token** section.

All the speculation options will take place in a peer-to-peer environment, like that of an exchange, however fully transparent, with no governing body, less fees, and no barriers to entry. There is no withdrawal fee, and no reason to worry about security of tokens because currently you aren't possessing any new ones while on our platform. There are no sign-ups, users can remain anonymous. Nobody can change or affect a trade once it is closed and engraved into the blockchain which ensures fairness. All the transactions and logic are controlled by our smart contracts so there is no manipulation. An MVP for O/U will be released before our ICO sale onto testnet June 13th, 2018 for public testing.



High level example of the flow of control of the first feature to be implemented in our derivatives market (coming to testnet June 13th, 2018)



Traditionally future contracts are one-to-one situations. O/U offers the chance for multiple users to join the same contract with the price contention decided by a maker to raise the odds and pot. However, there is a side-effect to allowing this new functionality. In a traditional futures contract, the price contention period may be set by the platform, or the contract is only between two parties. This cancels the situation we have where a contract is open to join from x to $x + 10$ time. The maker of the contract knows this because they set the time, and strategically set the strike price to factor this wait time in. There is no problem for the maker. However, for a taker looking to join at a time of $x + 5$ will feel at disadvantage if they enter now compared to another taker at $x + 8$ because they get the advantage of seeing the latest price action before taking a position. This situation would lead to less people joining the contract until the last minute. Until the last minute, this contract does not look as appealing to join, because the potential profit is much lower than it should be. Other traders may disregard the contract because of this rather than assume people will be joining at the last moments. Overall, this simple problem daisy-chains into a bigger one. To solve this, we implement our *FairEntryEngine* which allows everyone a chance to make an entry on even terms.

A simple high-level description; traders will now be able to indicate they wish to join the contract by supplying the amount they wish to speculate to our smart contract as a promise. Then in the final minute before the contract closes traders can tell our smart contract which position they wish to take. This allows traders to properly see the interest in the contract while allowing even entry terms. The promise is made to ensure there is no false claims made and an accurate representation is presented. This system would have a worst-case scenario of $2n$ amount of transactions rather than the original n amount. In a pure on-chain solution this means two times more fees and wait times. This situation highlights the importance of state channels on our platform which are discussed in **Future Iterations** below. When the trader makes the promise a state channel is opened, and the choice made by the trader in the final minute is made off-chain in the state channel, eliminating the potential $2n$ fees and wait time. Our smart contract checks that all transactions are valid and signed and the state is updated to include everybody's positions.

For the near future of our derivatives market the focus is on providing different functionality and tools that are useful for speculating on cryptocurrencies. There is a bigger picture that we must not forget about. The world's derivatives market is the biggest financial market at \$1.2 Quadrillion. The current cryptocurrency market is \$35 billion. As proven with volume numbers, there is already huge market potential in this sector, but our belief is:

"The world's value is becoming tokenized. The Ethereum blockchain is an open, borderless financial system that represents a wide variety of assets as cryptographic tokens. In the future, most digital assets and goods will be tokenized."

-0x Protocol

Traditional financial markets won't be able to match the benefits decentralized, transparent and secure markets can, and in the future, as the world's value becomes represented as blockchain-assets the world derivatives market will shift over as well. During and when this change slowly occurs our market will be ready to take on the monstrous volume. Our platform will be used to speculate on all types of things, from cryptocurrencies to traditional assets, welcoming traditional traders as well as cryptocurrency traders.



The EtherAce platform currently does and will have the first iterations of the chance suite game and derivatives market up as working prototypes (Flip and O/U). This section is to describe platform advancements in implementation and high-level description of further iterations of our derivatives market and chance game suite.

To compete with traditional financial and gambling platforms in terms of user experience regarding latency and flow, the EtherAce platform will be using a hybrid combination between off-chain and on-chain settlement. As mentioned in the **Issues** section of **Design**, the Ethereum blockchain currently has low latency, or is slower, because of the many transactions being done on the main chain. As the Ethereum Foundation works on different official scaling techniques, we for now will be applying one known as State Channels. The cryptocurrency sector has rapidly advancing new technologies from many different projects, this is why our current roadmap only extends to Q1 2019 (releasing further iterations September 2018). We cannot accurately depict now which technology or service we may be applying because we don't know what will exist to what extent. We have overall ideas, but designs have not been made to implement them.

That being said, we are not sitting back and waiting for the perfect solution. We will be implementing State Channels in both sectors of our platform. A state channel is a personal connection between transacting parties. Currently, protocols have been made focused on connecting two parties. It is important to note there is a wide range of implementations of state channels. The channel allows the smart contract(s) to make transactions off-chain, resulting in real-time and cheaper transactions. An infinite amount of transactions is possible to be made, and the channel can be closed in many ways. Examples include after a certain amount of value has been transferred, certain amount of transactions have occurred, or a period of time has passed. A smart contract ex. *Validator* would be used to verify different attributes of the attempted transactions, such as, does this party have enough value in their wallet to make this transaction. To complete a transaction both parties must sign it to verify it is correct. While both parties agree the transaction terms are correct, nothing needs to be done on-chain. However, say one party attempts to leave the channel early or cheat the other party in some form, the cheated party can dispute the transaction by updating the state of the blockchain via the latest transactions through calling a function. A different smart contract, *Inspector* would be called to settle whether the signature of the latest transactions is valid or not, automatically solving the dispute. The proper transaction is then made, and the cheating party, if any, is punished. These last steps, taken by *Inspector* occur on-chain, however before that, transactions were signed and recorded off-chain. State channels allow real-time transactions between two parties, while still enforcing honest behaviour through the blockchain.

State channels can be implemented for any section of our platform with functionality between two parties. In example, for our Flip chance game; we will be implementing a contract, *Creator*, that will form state channels between the player and the *Flip* contract. We will allow the player to pick how many cards they wish to flip (transactions made) or Ether bet. This is the maximum time this state channel will be open between the player and the *Flip* contract. It is possible for the player to close the state channel early by verifying the latest state is correct and having the *Flip* contract agree. Once the state channel is closed the updated state will be uploaded to the Ethereum blockchain and verified. All random generation of numbers will be done off-chain, similar to the transactions, and uploaded once the state channel is closed or a transaction is disputed. This implementation will allow the user experience to be greatly improved by allowing fluid gameplay and lower fees yet still ensuring total transparency and honest behaviour.



It is not practical or even possible to have a high-volume liquid market if the actions of opening and closing positions take a few minutes each to propagate onto the market order book. This is a problem with existing decentralized exchanges which have a pure on-chain order book. The different solutions we can implement mechanics are explained below.

This approach is based on and quite similar to the IDEX solution. In order to start speculating and taking positions, the user must send some Ether to our *FundsManager* smart contract which sets up their balance and funds on our market. To take a position, the user will create an order by buying (long) or selling (short) a number of arbitrary contracts within the limits of their balance. In a scenario where Dave is the maker and Alexa is the taker, and both have credit on our market because they sent funds to the *FundsManager*. Dave is selling 1000 contracts at a certain price and Alexa is buying them at the same price. Dave first instantiates the transaction for the order of selling 1000 contracts and signs it. The *EtherAceEngine* (EAE) verifies that Dave has 1000 contracts to sell. The selling order is added to the orderbook. Alexa creates a transaction for a matching order, and signs it. The *EAE* verifies Alexa has enough funds to buy the 1000 contracts. The *EAE* matches the orders, updates both of their balances, updates the orderbook and the signed transaction between Dave and Alexa is asynchronously deployed to the blockchain once orders that it is dependent on (order sequence that led up to it). The *FundsManager* is aware that an outstanding transaction exists for both users Dave and Alexa. The market has the new unconfirmed states of both users, and they can continue to open/close positions based off the latest state. In the background, the transaction is mined and confirmed on the blockchain and an event is emitted to the *FundsManager* confirming the order. Something to remember is users do not hold their funds, the *FundsManager* smart contract does, and users cannot withdraw until all transactions they made have been confirmed on the blockchain.

The above approach encroaches on the idea of this next approach. In that approach we still need to verify each transaction on the blockchain, but the on-chain transaction verification is performed in an asynchronous fashion rather than synchronous while using the new updated state so that the users do not need to wait for the on-chain transaction to be mined to continue speculating. Recall before how existing solutions are focused on creating state channels between two parties. We could implement a multi-party state channel. All users could join a single state channel and interact with each other inside this one state channel. Users would send some Ether to *FundsManager* to join the state channel. *FundsManager* would have a struct of Participant, containing user details, and a dynamic array of Participant, which holds all the current Participants in the market. The advantage of having all transactions conducted in one state channel is you wouldn't need to verify each transaction still as you did in the last approach, because it is a shared channel, the transaction history is known. Therefore, the *EAE* will only settle a transaction on-chain if a user disputes a transaction. If a user wishes to leave the state channel (with their funds) they set an exit flag. The *EAE* performs a check to see if they are currently involved with any unsigned transactions (either by the leaving party or other party involved in the transaction) and if they are requests the impassive party to either dispute the transaction or sign it. The impassive party is not able to continue trading or withdraw funds etc. until they have answered the *EAE*. If the impassive party continues to be unresponsive the *EAE* cancels the requested transaction between the two parties. If the leaving users record is spotless they are allowed to withdraw from *FundsManager* and removed from the state channel and Participants array. This is a very high-level explanation of this approach and there are many other details running below the surface to ensure security and fairness of the market.



Either one or a hybrid of these state channel variations is how our derivatives market will support a fluid and liquid orderbook that a traditional market has while still enforcing the security and honesty the blockchain provides. Building the derivatives market structure in either of these ways offer the many benefits mentioned above but will still be relevant and can build on top of Ethereum scaling solutions such as Sharding when they are implemented which will further improve our markets speed. The multi-party state channel would also apply to the chance game suite's peer-to-peer products. There are some promising projects building frameworks and protocols for multi-party state channels that EtherAce can utilize in the future. More research and development will be done before officially committing to a route.

Features that are sought after in platforms in our genre include leverage, margin-trading and perpetual contracts, functionality the EtherAce derivatives market requires to attract the substantial user base and volume we strive for. Perpetual contracts are similar to future contracts but with no deadline. We will offer a wide range of leveraging options, from isolated to cross, 2x to 100x. Cross margin indicates the user is using their entire account balance as margin, isolated uses just your initial margin. Recall that to participate in the market the user must send Ether to the *FundsManager*. A user can then open positions by buying or selling our (normal not smart) contracts which represent value denominated in USD (1 contract is 1 USD). When opening a position, they can choose to use leverage. Leverage is used to amplify profit or borrow money to attempt to amplify profit with value you don't have. However, at the same time you run the risk of being liquidated which is when your position don't hold enough margin for your position to be sustained. In traditional markets the user has the potential of unlimited loss or unlimited profit. We are modeling our market after the innovative Bitmex Limited Risk system, which has proven this system successful. This is a system where users can still have unlimited profit but have limited loss. In a traditional market when the users position is in danger of being liquidated they are called on to supplement their margin to support it. They can have unlimited loss as the price continues to zero (in a long situation). In this system, the user will only lose their initial margin (or account margin depending on the leverage used), even if the price continues to go against them. We don't force the user to supplement their margin.

Here is a quick explanation of how it works. An event-handler is created when the user signs the position and a channel is opened to the *LiquidatorEngine* smart contract. The liquidation price on a position takes in factors of balance, position size, and leverage used. The *LiquidatorEngine* is called by the event-handler which is triggered if the index price crosses the wrong side of the liquidation price. For shorts, this is if the index price is higher than the liquidation price, and the opposite for longs. The event-handler passes in the user and position information to the *LiquidationEngine* which runs through a series of steps and checks, each with a break option if evaluated to true. If the *LiquidationEngine* reaches the final step the position is closed on the market, and the initial margin/account margin is now a part of the EtherAce coverage fund which is discussed below. The *LiquidationEngine* also notifies the *FundsManager* of the updated user balance. Which in this case with cross margin is zero. Since we use smart contracts and pure code logic that releases a series of log events to easily check history and run our market, if the user feels cheated or wishes to see the proof they can call the *Validator* contract and the transactions along with the logged events will be available on the blockchain for transparency. This is the nature of building a system on top of the blockchain and creating a trustless environment.



Other simpler functionality such as stop-triggers are to be implemented in Q1 2019 before the official deployment of marketing strategies to complete the existing derivatives market. Three factors important to protect and ensure our market can function in the way we envision are market making, the coverage fund and the bankruptcy price. This system is modeled after the Bitmex implementation.

Market making provides liquidity to the market so other users can complete positions. They supply the orderbook. We will be using an automated market maker we design, while it is possible to make profit market making, the main purpose ours will serve is providing fluidness to the orderbook. The more illiquid a market is (the difference between selling and buying price is large) the more important the market maker is. An example of how our market maker will work: The lowest order that ETH contracts are being sold at is \$700, and the highest buy order is \$699 per contract. Our market maker will reduce the gap by setting a buy order at \$699.50 and a sell order at \$699.50. Note that our market maker may make profit. The profit will be considered in the design and can be used to close the orderbook further. The balance of the maker will never go below its initial balance and only requires a one-time capital start-up. On a liquid market, natural market makers will be sufficient to sustain the market. Our market maker is most important for the start-up of our derivatives market. Market makers get rewarded on our market by being paid 0.25% on any position they successfully make. Takers, the opposite of market makers get charged a 0.75% fee for any position they successfully take. This means market makers are able to make profit on our derivatives market by making an opening position at a certain price and making a closing position at the same price or better. The *EAE* will treat our market maker as a regular user.

The EtherAce coverage fund is formed from the profit or loss on liquidating user positions. If a position liquidation is able to be swallowed by the market, the profit goes to the EtherAce coverage fund. If a position being liquidated is unable to be handled by the market if the EtherAce coverage fund is positive, funds will be used to liquidate the position on the market. If the balance is not positive, we use a system similar to the Bitmex auto-deleverage system. The *LiquidatorEngine* force closes positions opposite to the liquidating position in order to finish liquidating the order. This is a fail-safe to protect the EtherAce market and will ensure it will never take a loss. The algorithm used by the *LiquidatorEngine* to close positions for auto-deleverage is sorted by most in profit, then most used leverage.

The bankruptcy price is the price at which the users initial margin can sustain their position to. As users utilize leverage, their maintenance margin requirement, the thing that sets their liquidation price, rises. This means their liquidation price also rises. There is a gap between the liquidation price and the bankruptcy price to protect the market. The liquidation price is when the *LiquidatorEngine* is triggered on a position, the bankruptcy price is the deadline for the *LiquidatorEngine* to close the position in question at. If unable to close the position before the underlying price reaches the bankruptcy price the system described above of the coverage fund and auto-deleveraging take effect.

These are some of the important dynamics that will make our derivatives market successful. The market dynamics are modeled after Bitmex, a successful centralized derivatives platform. The blockchain is used effectively with state channels to allow the efficiency of an off-chain orderbook while still maintaining the transparency of on-chain transactions. Our market is extremely convenient to use, anybody can access it because it is decentralized across the blockchain. There are no market requirements that traditional markets impose on users who are then forced to use intermediaries that charge high fees. It's much cheaper to run our market, therefore start-up costs are also cheaper, a benefit of using the blockchain. Users of our platform have further incentive than just using the different market instruments. Something to realize at this point is we've designed ACED tokens to be a market instrument which is part of what "Bet on us" refers too, not just the platform. We hope you see the potential and vision that we see.



Casual gambling

Our chance games give users the option of being able to relax and casually bet on competitively high odds of winning, in retrospect of the more intense speculation options, which require user's skill, attention, strategy and analysis. Online gambling is a market of \$56 billion. More than 4.5 billion dollars has been wagered in cryptocurrencies on gambling sites. Betting volume grows linearly as popularity of cryptocurrencies increase. Many of these sites are Bitcoin casinos. This directly relates to Bitcoin being the most popular cryptocurrency. As Ethereum increases in popularity, so will the users, and EtherAce will be poised to take advantage. Dice gambling websites such as SafeDice and Etheroll attract millions of dollars in volume weekly, with a single game. We plan to start by implementing a similar styled game with a twist, offering a great UX through state channels. Additional games will be developed to further increase the volume on our platform, attract users and grow the community. Choosing the theme of cards for our games gives us many options and flexibility. It also gives our users a new experience from the traditional dice games while keeping the functionality they enjoy.

Derivatives

Our speculation options offer functionality similar to that of futures or hedging options. The world derivatives market is \$1.2 quadrillion. Bitmex, a centralized cryptocurrency derivatives platform experiences over four billion USD of volume in a 24-hour period. This helps show the potential the EtherAce platform can unlock with its own derivatives market. Bitmex is popular because it has high volume (liquid), it offers up to 100x leverage, it's open 24 hours, and its Limited Risk system (discussed in **Future Iterations**). We plan to offer this functionality on our platform, as well as others to help attract the volume and users. Traders can use our market in a variety of situations. An example would be to hedge against price drops for coins or tokens they hold. It will be cheaper for traders to use our market to hedge rather than transfer to an exchange and sell their tokens and withdraw etc. Especially if they long-run believe in the token but short-term want to protect against potential loss. Another example would be to place bets on future prices of different tokens on the platform, in short- term or long-term situations, to make profit.

Why can't they just actually buy or sell the coins or tokens if they believe it may rise or fall in price? Part of the answer was hinted above and is simple: Why are derivatives the largest financial market in the world? Derivatives are used to mitigate risks in your portfolio, they're another financial instrument that traders can use to make profit, or protect themselves from loss, similar to buying and selling tokens on an exchange. EtherAce currently has a simple 5% fee to place bets on O/U (future iterations will remain competitive with exchanges trading fees, closer to 0.25 – 0.75 per trade as it is a true market). Compared to exchanges fees which are high in comparison, with transferring, trading and withdrawal fees. Users of EtherAce also will not need to worry about transaction costs or the security of the tokens they are betting on because they won't be buying any ownership into them. Using EtherAce is much cheaper, faster and more convenient. It is also decentralized, trustless and users can be given back value they spend on our platform and benefit from all other volume.



The first features that have and will be implemented on our platform were chosen because they show the creativity and help clearly illustrate the main ideas behind each of the different sections (chance game suite and derivatives market).

Flip

Our MVP for our first chance game, Flip, is designed to be intuitive and simple. The top of the page provides links to other areas of our site as well as a dropdown “How to Play” guide and “Order of Cards” which shows the hierarchy the cards are perceived to be in. Users can click on “Demonstration” to watch a YouTube video on how to play.

The left side of our app is where the user can specify which game setting they want to play and how much to bet. The user can choose to manually enter the amount of Ether they would like to bet, or they can take advantage of our convenient shortcut buttons. The user can easily double their bet (“X2”), divide it in half (“/2”) or use the “Min” button which sets the amount to the minimum bet (currently 0.01 Ether). Underneath these are the styles of playing the game. Users can choose between “Over” where the goal is to flip a card over their chosen card. “Under” where they want to flip a card under their chosen card. “Bet on Black” where they want to flip any black card in the deck and “Bet on Red” where the user wants to flip any red card in the deck.

The middle of the app is where the user flips the card. Upon flipping a MetaMask window will prompt the user to confirm the transaction. After confirmation, a loader will visually show the user the transactions are being processed, in the smart contract, Oraclize, and the random data source. Lastly, the result is returned to the user (“You Win” or “You Lose”) along with the flipped card.

The right side of the game is used for showing card selection, potential profit and adjustment of odds. The profit section is dependent on the amount bet, which game mode is currently set, and the user's card selection. The reward increases the lower the user's odds are and smaller the higher they are. The slider is used for the card selection, it can be incremented or decremented by one with the arrows on either side.

Community suggestions are always welcome, and we would love feedback on any changes that should be made or features to be added to enhance the user experience. One feature currently not in our MVP but we will be doing is a chat-box. The chat-box is important to note because it helps players socialize, be more relaxed, and form a community as they play. Our query to Random.org is partially encrypted to hide our API key. Note this does not change the actual query in anyway so users can be sure of the code honesty.



Over/Under

The MVP of our first derivatives market contract Over/Under (O/U) is currently not on out on testnet but is coming soon on June 13th, 2018.

On the left part of the screen users have a control panel that will be able to create contracts that behave functionally like future contracts. Users will have the option to create a contract for any supported tokens or assets. The token the contract is created for depends on which tab the user is currently in. To the right of this is the time duration options, for both the time the user will allow other users to join, and the duration of the futures contract. These options will be held in drop-down menus, the user will only be able to select one from each section. Next the user sets a strike price and chooses either to bet over or under it and then creates the contract by clicking 'CREATE CONTRACT'. Contracts with duplicate settings to already existing contracts will not be created, and the user can either join the already existing contract or alter their contract settings. In the bottom of the control panel are live price stats about whichever token the user is currently viewing.

Initially we implemented it by not allowing the user to set the strike price directly, but by creating a contract at a certain time where our smart contract then sends a call to Oraclize to set the strike price. We have changed this because letting the user set whatever price they believe supports true speculation. Also, the current wait times on the Ethereum blockchain could alter what the user intended the price to be and the cost to our platform is less as we place half the amount of calls to Oraclize.

The main section of the user interface is used to show the existing contracts. Contracts for different token types will be separated by a tabbed carousel. For each contract, information such as the contract total amount bet, start price, and time duration settings will be displayed. If the contract is open, users can select the contract they wish to join, then on the bottom part of the control panel enter the amount to bet, what option they choose and 'JOIN'.

As with Flip, our first chance game, we will be implementing a chat-box because it helps traders socialize, be more relaxed, and form a community as they play. Because O/U is peer-to-peer, the chat-box is even more important. Traders can set-up contracts and agree on prices that they are willing to bet on with each other. Other features to be implemented would be our *FairEntryEngine*, supporting more tokens, and removing time constraints for creating contracts to allow users to speculate at any period they wish. The smart contract has been designed to be modular, robust and easily scalable. We use a hash map with unique ids to store and quickly access live contracts and their traders. String concatenation is used on the Oraclize query for the price check to make the code cleaner, less gas expansive and O/U easily scalable to more tokens. We log the string used for the Oraclize query onto the blockchain, so users can still be sure of the code honesty. In further development, a legitimate futures contract that follows the same design as a traditional futures contract will be made available. That is a separate product from O/U.



The EtherAce platform exists on top of the Ethereum platform. The platform's logic is coded using Solidity in smart contracts which will and do live on the Ethereum blockchain. The Ethereum environment was chosen for our platform because of the Turing-complete Ethereum Virtual Machine (EVM). This is what allows our platform to be created with smart contracts and gives it the characteristics of a decentralized application (dApp). There is more explanation on the EVM in our **Context** section.

Issues

Scalability is the main impediment facing blockchains, and the Ethereum blockchain thus far is not an exception. Reducing latency and block times will be important for our platform. Slow block times would make the user experience worse, for our chance games or derivatives market. This is currently the trade-off for creating a fully decentralized, trustless and open platform on the blockchain however there are different solutions. The Ethereum Foundation is working on many solutions such as Sharding and Plasma, and substantial progress is being made. For the period of time where scaling stays as an issue options such as using State Channels as discussed in **Future Iterations** will be implemented by the EtherAce team to help improve platform efficiency and transaction time.

Front End

The EtherAce platform's different Graphical User Interfaces (GUI's) are built with several different technologies. Included thus far but not limited to would be Web3.js, to interact with the blockchain. Express.js, a server-side framework. Node.js libraries, for both client-side and server-side code. Naturally HTML, CSS as the basic structure of all GUI's. Finally, Bootstrap to ensure the platform is responsively designed.

The GUI's will be easily navigable for any level user, a blend of consistency, intuitiveness, clarity and attractiveness. Proximity of the different layout elements to each other, and engaging colors and effects all lead to the creation of quality user interfaces. The GUI's will and are built for web3, and use web3 providers such as MetaMask, a browser extension on Google Chrome and Firefox, to collaborate with the Ethereum blockchain and EtherAce smart contracts.



Back End

The EtherAce's platform is built on top of the Ethereum network and uses the Ethereum blockchain as it's backbone. All back-end logic is contained in smart contracts, written in a contract-oriented language (COL) Solidity. We use the OpenZeppelin Library to help write secure contracts and practice safe patterns. We use the Truffle framework as our developing environment and the Truffle.js libraries truffle-contract and truffle-artifactors to help build and deploy our smart contracts. State channels are used to create a fluid UX and reduce transaction costs. Oraclize, a provably-honest oracle service is used to retrieve certain data from the real world, such as token prices, or random numbers. The EtherAce platform logic exists in smart contracts. Smart contracts are unable to fetch data on their own because they live on the blockchain which is a closed, trusted environment. Therefore, to retrieve the data required for our platform, we are currently using Oraclize. C++ is also used with Solidity to help run the EtherAce order-matching engine.

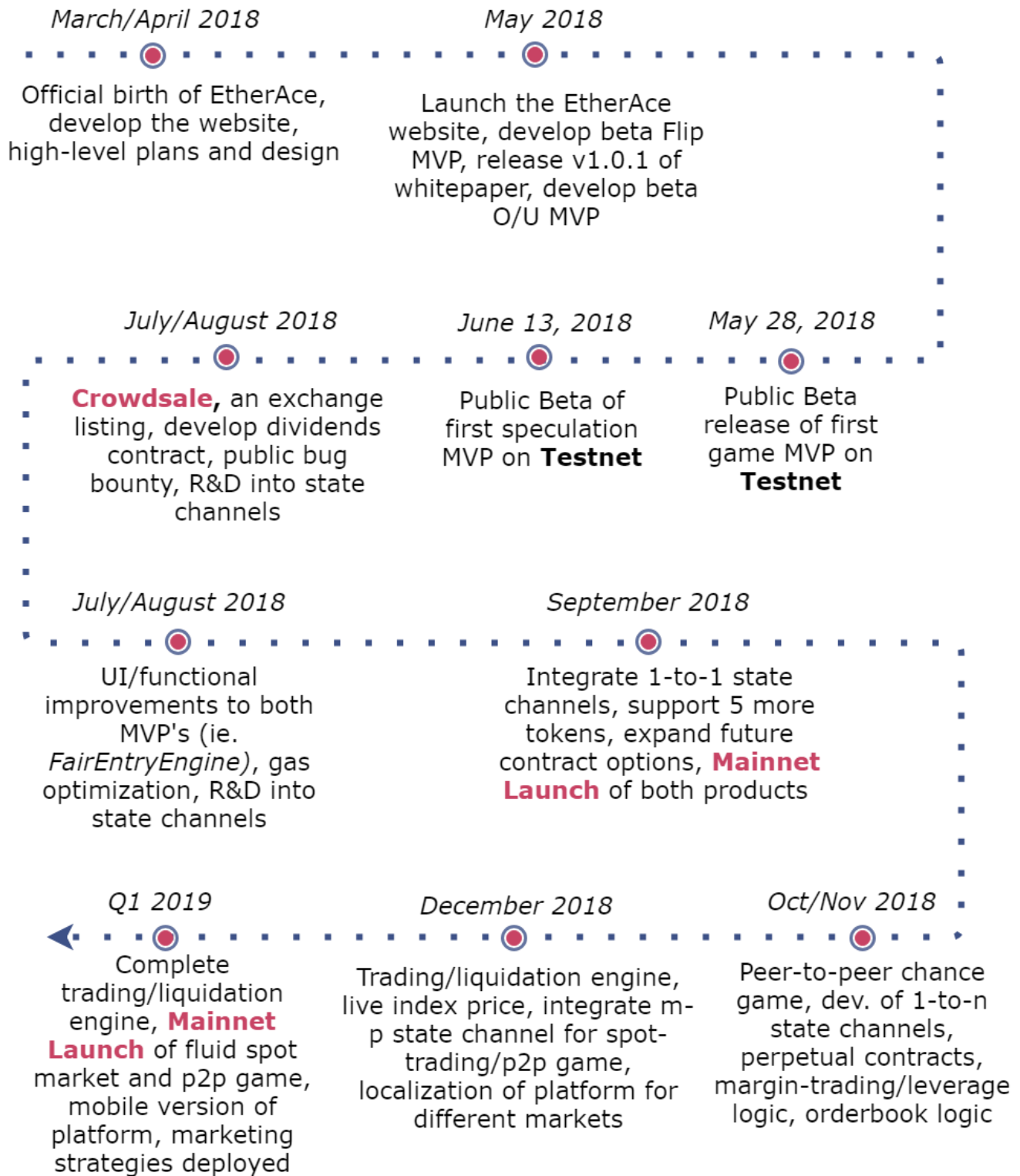
Avoiding Manipulation

The chance game suite results rely on randomly generated numbers. We are currently using Random.org who offer true random numbers derived from atmospheric noise, not pseudo-random which are derived by an algorithm. There are different options to possibly use, and in the future different tools may be better suited to use and we can change our source.

The derivatives market could be subject to manipulation, as we use Oraclize to retrieve prices of coins or tokens which determines who wins the bet. To combat this, we will only be listing coins or tokens which have a sufficient amount of daily volume. If we were to list coins or tokens with low volume, certain parties could have the ability to manipulate the price for gain on the EtherAce platform. Another precaution we will be taking is pulling prices from multiple different sources when checking the price at the end of a pool or bets fixed period. We will then aggregate all the different prices to find an average price. Thus, we avoid having a single point of failure system implemented. For our Over/Under MVP we are currently only using one data source, but that will be changed in the future.

In future iterations of the derivatives market, when we implement an underlying live index price which is used to trigger liquidations, we will be following the same security pattern and composing it of multiple different exchanges. This is worth noting because we have currently planned to use a last price index. A last price index is based on the last prices the market has seen, in our situation, on several different exchanges aggregated together. If we were to use a last price index and simply use one exchange, the possibility of manipulation would be extremely high, because anyone could change our index price by simply placing a market order on that exchange.

ROADMAP



*An updated roadmap with iterations past Q1 2019 will be released September 2018



Official marketing of the EtherAce platform will not begin until Q1 of 2019 per our roadmap. This is because the initial goal is to focus on developing highly-approved and useful features. There are two parts to reaching this goal: The first is to follow the high-level development plan the team has put together to reach a certain vision of the platform. The second comes from the community feedback or ideas as features are iteratively developed and tried. We have a vision of how this platform will work, and we believe the community will be able to help us correct misjudgments in the plan. This could apply to features we develop or features we haven't initially planned to develop but are seen to have beneficial value.

By Q1 2019 the platform will have a fluid market offering a futures contract and perpetual contract and a peer-to-peer and low-house edge game. All implemented features will be functioning at high performance, fine-tuned to a professional level. The platform will be available in different languages and on mobile devices. This is not the end-goal of the platform, and the development will continue, however the platform has reached a level where it's ready to be mass-marketed and properly utilized. The platform will have been used up to this point, and possibly volume has grown massively before official marketing has begun, through the community or likewise. In this case, some marketing funds may be directed towards forming new partnerships and extra development of unplanned functionality, the remaining marketing will be used to truly dominate this sector. However, it is more likely the platform users and volume has not grown to the point we envision, as we keep in mind the daily volume numbers of Bitmex and SafeDice, and how it would be hard to reach these without an effective marketing campaign and well-oiled platform to market.

Marketing strategies have not been made final, will be handled by a formal marketing team, and won't be released at this stage. For the chance game suite, marketing is more to get the word out, so users can come and experience them. For the derivatives market, marketing is also to get the word out, so users experience it, but also to supply liquidity and volume. As volume increases on the derivatives market, so does liquidity, and so do the users. To be specific, this form of marketing would be similar to an exchange who's trying to attract users, liquidity and volume. However, our task is much simpler because we offer a differentiated product with much less competition. Some forms of marketing used could include affiliate links, promotional codes, discounted fees or standard advertising.

The EtherAce platform will be open to partnerships, however will not begin publicly pursuing them until September 2018 after the mainnet release of our first features. There are projects that it would be beneficial to form an official relationship with, to work on incorporating or using their services with our platform and conversely, or for marketing purposes.



ACED is an ERC-20 standard token. 125,000,000 ACED tokens will be minted at the time of the Crowdsale and then will never be minted again. This will restrict the max total supply of ACED token to 125,000,000. Holders of the ACED token will receive quarterly dividends (hence ACE Dividends) proportionate to the amount held that are formed from 100% of the profit the EtherAce platform generates from the different sections of its platform. This is a combination of the 'house' edge and user service fees. In the first features we currently have a 1% edge and a 5% user service fee. While the dividends are being issued to holders, ACED tokens will be locked and non-transferrable. This follows the same security pattern employed by other dividend-paying projects such as Ethorse and Etheroll. Holders will also be able to vote. Community thoughts and ideas are always welcome, but the voting aspect of the ACED token represents how the community feels in an official way. An example of something the community could decide was mentioned in an above section about our O/U feature, to recap:

In a situation where the price is the exact same as the initial price, there are three options. EtherAce could keep all the Ether bet, we could refund all participants, or we could wait a random duration of time and call the price again to resolve it.

Other high-level voting examples would be service fees, new or improved features, platform and marketing strategy. The team has different ideas of overall platform strategy however instead of deciding it completely by ourselves, we are open to hear what the community thinks and work off that. Once the marketing strategies have been deployed, we expect the volume to exponentially increase on the platform. The community will have more options after this, such as dividend periods could be made monthly. After the features to be implemented to make the core platform have been fine-tuned the EtherAce team will start developing features unlocked first by being an ACED holder, then secondly by amount held. An example would be using ACED tokens to deposit into *FundsManager* to cut 20% fees off your service fees. We strategically chose this route (having a token) because we believe it will give our platform the competitive edge if it is the community's platform where users can make use of the first-rate functionality but also benefit from the volume it is exposed to. We have plans to implement to incentivize buying, holding or using our token. This is modeled off the successful strategy employed by Kucoin and Binance, both relatively new but top-quality exchanges.



Crowdsale Date

Phase 1: Whitelisted Sale	July 12 - July 13, 2018, 17:00 GMT
Phase 1: Public Sale	July 13 - July 19, 2018, 17:00 GMT
Phase 2: Public Sale	July 19- August 16, 2018, 17:00 GMT

Ethereum addresses registered on the Whitelist will have access to the Crowdsale before the public as well as a 100% bonus. To join our Whitelist, go to our website and click the “Register for Whitelist” button on the home page or click [here](#).

ACED Token and Crowdsale Information

Type	ERC-20
Token Symbol	ACED
Fixed Total Supply	125,000,000 ACED
Max Tokens at Crowdsale	100,000,000 ACED
Crowdsale Hard Cap	8,665 ETH (5,200,000 USD)
Crowdsale Soft Cap	866 ETH (520,000 USD)
Crowdsale Address	Will be on our website July 12th, 2018

The value of ETH may fluctuate before the Crowdsale therefore ETH values for Hard/Soft Cap’s may change to match. The Crowdsale Address will be made available on our website July 12th, 2018 17:00 GMT on the Home page. Unsold tokens will be burnt one week after the Crowdsale is finished. There is no minimum or maximum contribution per person. If the Soft Cap is not reached, all ETH collected during the Crowdsale will be refunded upon community consensus. The Hard Cap is 8,665 ETH (5,200,000 USD) and the Crowdsale will be closed when reached.



ACED Token Rate

Phase 1: (100% Bonus)	1 ETH = 11,538 ACED (0.052 USD)
Phase 2: Week 1 (50% Bonus)	1 ETH = 8,654 ACED (0.069 USD)
Phase 2: Week 2 (25% Bonus)	1 ETH = 7,211 ACED (0.083 USD)
Phase 2: Week 3 (10% Bonus)	1 ETH = 6,339 ACED (0.094 USD)
Phase 2: Week 4 (0% Bonus)	1 ETH = 5,769 ACED (0.104 USD)

As mentioned above, the value of ETH may fluctuate before the Crowdsale therefore ETH to ACED rates may change to match. To ensure fair pricing once listed on exchanges, bonus tokens will be made transferable 25 days after base tokens are unlocked. If all tokens are sold and the hard cap reached in Phase 1, bonus tokens are unlocked with the base tokens. ACED Tokens will appear in the wallet within a week from the Crowdsale contribution.

Token Distribution

Crowdsale	100,000,000 ACED (80%)
*EtherAce Team	18,750,000 ACED (15%)
Bounties	6,250,000 ACED (5%)

**The teams tokens will be time-locked with a smart contract, every six months 33% of the total team tokens will be released. (Released over 2 years). In the case of unsold tokens, team tokens will be burnt to maintain a ratio of 15% of total supply.*



Funds Allocation

Development	40%
Marketing	35%
Bankroll/Liquidity	20%
Exchanges	5%

An initial amount will be set aside for exchange listings however further funds may be derived from the marketing division as exchange listings are a form of marketing strategy. At this time one of our marketing strategies indirectly provides liquidity to the platform, therefore that also could be derived from the marketing division. Liquidity refers to the start-up capital of our market required by the market-maker. Non-obvious sub-sections of development include business operations and the business reserve funds. The EtherAce team is currently small at three members and will use the Crowdsale funds to assemble a top-quality team who shares the same vision and have the same drive for the EtherAce platform. Thus far all work has been done in-house, and will continued to be done in-house, just with a much larger team to help us implement the roadmap that has been laid out. This gives us the advantage of coding and designing our own system architecture so we can quickly hot-swap in new features or changes, and not rely on a third-party to do it for us.

THE TEAM



The EtherAce team is currently comprised of three members who have immersed themselves into Ethereum and the blockchain since hearing of it in 2015. We have experience developing blockchain applications and careers in financial market enterprise-level application software. For the time being, the team wishes to remain anonymous for the benefit of the EtherAce project. Parts of the EtherAce platform can be classified as unregulated online gambling and speculation which is considered to be illegal in some countries and the nature of decentralization and the internet ignore borders and regulation. While that is the power of decentralization the team does not wish to be the centralized owners of what can be considered an illegal business. Remaining anonymous will help the EtherAce platform to be truly decentralized and protect it from ever being stopped or taken down in the future. Unfortunately, our past experience in applicable sectors cannot be used as merit in this situation so we aim to earn trust through the work done thus far and in the future. We will be posting a Medium article in the near future to go further in detail on our account EtherAce.

The team will be responsible for developing the platform logic with smart contracts in Solidity, and creating responsive and aesthetic user interfaces in HTML, CSS, Bootstrap and Javascript. The *EtherAceEngine* (order-matching engine) is written in C++ and Solidity. We will also be responsible for managing the business, forming partnerships, creating marketing strategy, graphic design, and social media management. The team is focused on bringing a multi-tiered decentralized betting and derivatives platform to the cryptocurrency sector. The team has high respect for anonymously run successful projects such as Ethorse and Etheroll and have chosen to follow the same path. Thus far we have one MVP for our first chance game out on the Kovan testnet and are releasing our second MVP for our first derivatives contract June 13th, 2018 as per our roadmap. We ask the community to believe in our work and products created now and, in the future, in order to establish we are capable of developing and managing this project with an extreme amount of potential. Our Github account, EtherAce currently has 198 commits, and grows every day as we continue to develop this platform. Please reach out to us in the designated communication channels on Reddit, Twitter, Medium or Telegram and share with us your thoughts and feedback. We will always consider and welcome community members suggestions on how to improve the EtherAce platform.



In the cryptocurrency sector there are risks of theft, hacking, lack of adoption and technical issues that could result in people losing their funds. Participants in the Crowdsale should not view the EtherAce platform as a guaranteed return. Buying ACED tokens should not be considered an investment that is guaranteed to increase in value. The EtherAce team may be unable to finish developing the platform as described in the contents of this document, website, and other articles if the value of Ether severely declines because the Crowdsale is performed by collecting Ether and the project funded by Ether or if the Ethereum Environment and Blockchain ceases to exist because EtherAce is built on top of and leverages the functionality of it. ACED tokens do not give any controller ownership, equity, direction, or decision-making of the EtherAce platform as a whole.

You should not participate in the Crowdsale if you reside in a jurisdiction which prohibits participation in a token sale or the purchase of tokens. This includes any company, trust, corporation or singular entity. Such as residents, nationals and citizens of the Republic of Singapore or People's Republic of China, or any other jurisdiction in which it is not permissible to participate in token crowd contributions. Crowdsale participants and platform users should follow the rules of their region of living such as their involvement in the cryptocurrency sector and online gambling laws.



Thanks

The EtherAce team would like to thank Satoshi Nakamoto, Vitalik Buterin and the Ethereum Foundation, and the cryptocurrency community for making this project possible. Thanks to our mentors and advisors as you provide us irreplaceable advice and continue too, you know who you are. We'd also like to thank any potential investors for their interest in this project.

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