The NORACLE Whitepaper

Version 1.0.5 – Draft

This whitepaper is meant to be treated as a draft and further revisions will be made to this document.

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1. Executive summary

In finance as well as in the fields of risks prevention and gaming, prediction applications can be very useful for qualitative decision support. However, given the wide disparity between the domains in which predictions can be applied, careful study and modeling of each domain is necessary for the design of good prediction applications. NORACLE is an open protocol that aims to serve as a Numeric Oracle for various prediction applications on the blockchain. The protocol is intended to support the development of applications that offer users the ability to use appropriate parameters in any domain to generate good predictions.

The first version of the protocol focuses heavily on gaming by providing APIs that can be used to develop various apps with high potential of adoption in GameFi. In the medium and long term, models in other areas will be added to the protocol to diversify the offer and build an increasingly solid and dense ecosystem capable of covering the needs of a larger number of users around the world.

NORACLE also implements a powerful DeFi instrument to allow Dapps users and token holders to earn rewards directly and sustainably in proportion to their participation in the ecosystem. A special implementation of the Certificate of Deposit model will ensure a high ROI (Return on Investment) by relying on the revenue stream generated by the volume of activity in the different Dapps of the ecosystem, as well as on the bitcoins and the blockchain's native BNB coins that will be acquired by a portion of the revenues and placed into the ecosystem reserve.

One of the specificities of the rewards system for token holders in the NORACLE ecosystem is the generation of rewards in BNB and NORA. Each participant in the ecosystem will be rewarded twice, with a reward in BNB in proportion to their net deposit, and a daily generation of NORA proportionally to their total deposit in their active stakes. BNB rewards are called Ecosystem Rewards (ER) because they will be directly related to the overall value added through usage of the various applications in the ecosystem. The NORA rewards (NR) are generated consistently from the user's total deposits.

NORACLE is designed as an oracle that doesn't just aggregate real-world data into the blockchain, but as a true decentralized decision support tool for prediction markets around betting on games and real-world event outcomes in sports, finance, crypto-currencies, and the metaverse. The NORACLE API can be used to develop a series of tools for optimization, strategy building and performance measurements in prediction applications. Any developer can use the API to generate predictions for their Dapps insofar as she complies with the community guidelines.

As a prime example to showcase the power of the protocol, Noracle Labs is building the NORA642 game, which will be launched together with the first version of the protocol. NORA642 is a number prediction game involving the choice of a subset of numbers, a typical example of how a very popular game can be remastered with unique features provided by the NORACLE protocol. Another example we can think of are horse racing games in the metaverse where the outcomes will heavily depend on numerical characteristics of the NFTs used by the competitors.

2. Disclaimer

The information in this whitepaper is intended to be an accurate description of what the NORACLE protocol is, and of how the ecosystem works, but nothing mentioned herein should be construed as financial advice, nor should it be considered as a recommendation to buy or sell any tokens, shares, or securities.

We have compiled the information herein to the best of our ability and from sources we consider to be reliable. However, there is no warranty of any kind for the accuracy, or the actuality of any information provided. All data, graphs, charts, and other visual aids are for informational purpose only. Nobody should make any investment based on them only. Do not trade or invest in any tokens, companies or entities based solely upon this information. Any investment involves substantial risks, including, but not limited to, price volatility, inadequate liquidity, and the potential complete loss of principal.

Investors should always do their due diligence before investing in projects of any kind. It is important for them to develop their own judgement on product and market fit prior to making any investment decision. When necessary and/or if applicable, investors should consider the assistance of a professional financial, legal, and tax expert on topics discussed in this whitepaper.

The economy of the NORACLE ecosystem is based on its native token, which is NORA, and on a few other digital currencies which are either kept in its reserve, or used in ecosystem's transactions, or redistributed to participants in the ecosystem. By design, the ecosystem doesn't handle any fiat currency of any particular country, nor it applies any tax related to any particular jurisdiction to token holders. Any purchase or sale of digital currencies used in the ecosystem takes place outside the NORACLE ecosystem, and may, depending on the jurisdiction of user's residence, be subject to taxation. Noracle Labs bears no responsibility for any issues arising from the taxation of digital currencies used in the NORACLE protocol.

Last, but not least, Noracle Labs expressly disclaims any and all liability for any direct or indirect loss or damage of any kind resulting directly or indirectly from reliance on the information contained herein, any errors, omissions or inaccuracies in such information or any actions resulting therefrom.

3. Market Overview

There is a good reason why Vitalik Buterin stated on some occasions that prediction Dapps are among the most underrated on the Ethereum platform. The same can be said of all other smart contract-enabling blockchains in general. The NORACLE protocol, as a base layer for a multitude of applications ranging from financial predictions to prediction games, is well positioned in a multi-trillion-dollar global market.

Even limiting the market analysis to the gaming sector, since the first known uses of the NORACLE protocol are in prediction games, it is a global market of about 200 billion dollars in which the protocol will be involved.

According to Dataprot[1], the gaming industry has grown so much recently and there are 3.2 billion players in the world. The average age of players has moved up in recent years to 35, as more people who grew up playing video games became adults. Also, according to Dataprot there are more than 3.03 billion PC players worldwide and Asia is the largest gaming market, with 1.48 billion players. Indeed, according to Newzoo[2], the 3.2 billion players in 2022 would have spent a combined total of $196.8 billion. And their forecasts show that the market will continue to grow in the coming years. The main driver of global market growth is mobile, which will generate $103.5 billion in revenue in 2022. Regions such as Latin America, Asia-Pacific, the Middle East and Africa, which are home to many high-growth markets, will largely drive this player's growth in 2022 and beyond.

With technological advances in the gaming world, the industry will grow considerably, not only because of the variety of games provided, but also because of the quality of those games. The new games improve the overall gaming experience of users and attract even more players. As a result, the number of players should be much higher than in previous years, because many new players are curious in addition to young people who start very young and grow up there. The PriceWaterHouseCoopers (PwC)[3] has done researches in this direction as well, particularly in the area of video games, and has provided a report that the global video game market is expected to reach $294.35 billion in 2026, increasing at a Compound Annual Growth Rate (CAGR) of 8,53% over the 2022 to 2026 period.

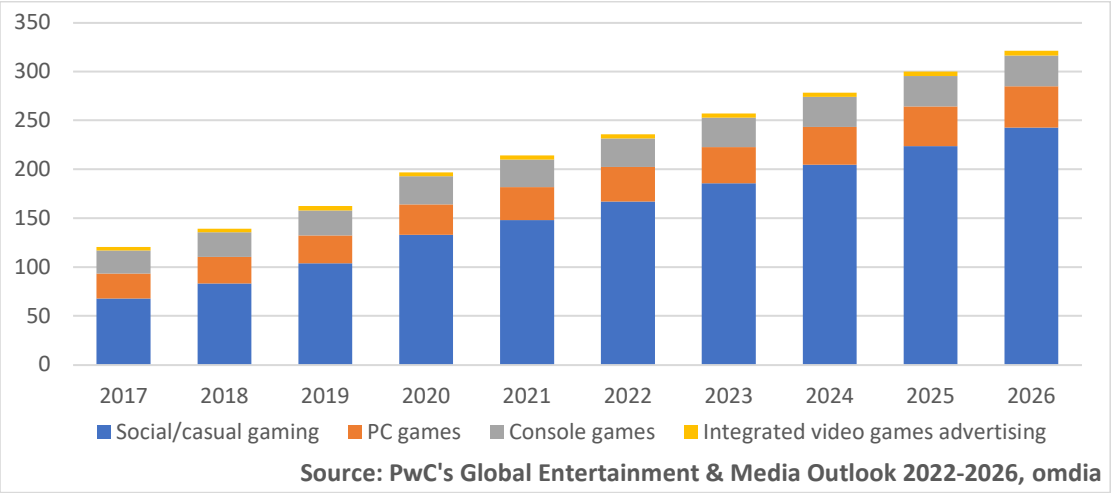

Diagram 1. Total global video games revenue, by segment (US$ billion)

With the advent of metaverse in the world of entertainment in general and gaming in particular, the world of gaming should experience a considerable change. According to Global Market Estimates (GME), the Global Metaverse in Gaming Market is projected to grow from USD 36.81 billion in 2022 to USD 710.21 billion at a CAGR value of 38.2% from 2022 to 2027.

According to the Business Research Insights [4], the whole GameFi ecosystem had a size value of USD 9 billion in 2021 and is expected to reach a market size of USD 38 billion in 2028. The coin tracker Coin Market Cap [5] indicates a valuation of GameFi exceeding USD 20 billion at the peak of the last bull run of crypto assets in 2021. Considering that also gambling solution

providers could be using the NORACLE protocol to feed their systems with predictions, this opens the protocol to another market with a projected USD 840 billion worth of value by 2026 [6].

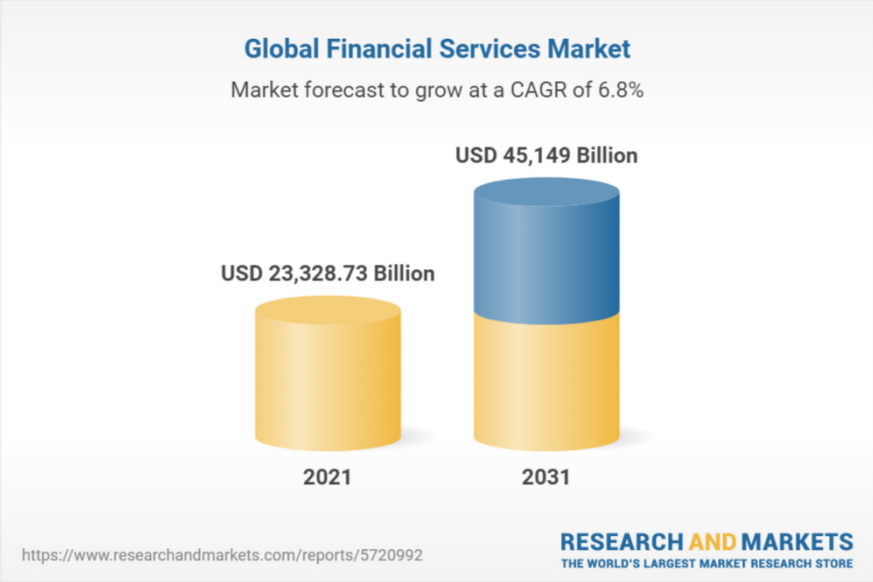

Diagram 2. Market size of Global Financial Services

On the other hand, the global financial services market has reached a value of over USD 23 trillion in 2021 and is expected to reach USD 45 trillion by 2031, growing at a CAGR of 6.8%. Due to the increased use of the internet and smartphones, a significant portion of this global value is captured by online financial services, including online stock and (crypto)currencies exchanges. It is highly conceivable that such services will interact with the NORACLE protocol in the future to provide qualitative decision support tools to their users.

4. Noracle Labs

The ultimate goal for the NORACLE ecosystem is to be fully decentralized in such an extent that further developments or changes to the ecosystem would be achieved without any coordination of a central authority. Like in any serious crypto project, the road to this ideal goes through the formation of a competent team which can pave the way with concepts and implementations in the early days of the project. That is the role the company Noracle Labs has assigned to itself by carrying the vision behind the nascent NORACLE ecosystem and coordinating the efforts of building the ecosystem towards a true Decentralized Autonomous Organization (DAO).

It is important to highlight the difference between the company Noracle Labs and the NORACLE ecosystem. Any resource belonging to the NORACLE ecosystem is co-owned by all token holders, while Noracle Labs operates as a company, with its own revenue streams, and a shareholder structure that is not determined by NORA token ownership.

While initially not holding any NORA tokens itself, Noracle Labs will maintain a key role in the NORACLE ecosystem at least until full DAO status is achieved. The company will mainly generate revenues necessary for its operation from activities in the NORACLE ecosystem, such

as, to name a few examples, a portion of applicable transaction fees, a portion of the Ecosystem Rewards (ER) generated by the NORA tokens locked in the black hole (see chapter 6 about the Tokenomics), the various fees applicable for access to certain ecosystem features. These are, among others, additional fees when a user wants to generate more than 2000 number combinations, or when a user does not have at least 100 NORA net deposit, but wants to generate predictions to take advantage of the NORACLE features and ecosystem dynamic to play traditional prediction games. Examples of future games enabling this are NORA-MM (Nora for Megamillions), NORA-PB (Nora for Powerball), NORA-EM (Nora for Euromillion), etc.

5. The NORACLE Ecosystem

NORACLE forms an ecosystem whose essential pieces are the community of people using Dapps or playing games built on top of the protocol; the NORA token, and an integrated platform where users can play their beloved games across different type of devices, or stake tokens for rewards in NORA and BNB. To sustain the ecosystem growth and to give users an incentive to be part of the ecosystem by holding the NORA tokens, 10% of the revenues generated by all the Dapps and games in the ecosystem are directly redistributed to token holders in form of ecosystem rewards (ER) through the smart contracts.

5.1 NORACLE Games

The NORACLE protocol implements an API based on a process developed and patented to introduce rationality into the correct choice of a combination of *x* numbers from a total of *y* numbers. Under patent number US8727859B2 [7], classified in category H04L67/131 (Protocols for games, networked simulations or virtual reality), a process is described on how to characterize unstable sets or subsets of number combinations to enable an approach of efficient, and at the same time participatory gaming. This process inspired the development of all the components of NORA642, the first game built on top of the protocol. These components give NORA642 the power to let players choose to build any kind of configurations (noris) to generate their game combinations, to reuse existing noris, built for example by other players, and to participate in noris competitions where the best strategies will be evaluated and rewarded automatically by smart contracts.

In a logical move, a series of other games using the same process will expand the ecosystem by offering a framework for hundreds of millions of players of the largest state lotteries around the world, such as Mega Millions, Powerball, Euromillions, EuroJackpot, etc., to connect and interact to play or compete with noris built to optimize the games in their favorite lotteries. The roadmap includes games such as NORA-PB (NORACLE for Powerball), NORA-MM (NORACLE for Mega Millions), NORA-EM (NORACLE for Euromillions), NORA-EJ (NORACLE for EuroJackpot), NORA-AM (NORACLE for Africamillions), etc. These games will let the players generate number combinations based on noris, which they can bring to their local lottery tickets vendors.

The particularity of all games inspired by the above process is to let users around the world control their chances and optimize the way they play any numbers-based gaming system. Those games involve strategy, analysis, and randomness, and they turn number prediction gaming into a social gaming like system with user interactions and competitions based on pattern observations and number manipulation skills of the participants.

You can use the analogy of a box containing millions of coffee beans to explain the basic principle of the above-mentioned games. One could think of the combination of numbers to be predicted as one of the coffee beans in the box. Players try to circle the sought coffee bean using the tools provided by NORACLE. It takes a configurative approach to describing the area of the box where the right bean is likely to be found. The best configurations encircle the desired bean the most, and the winners of the game are those who build the best configurations, or those who simply hit the right area by chance.

Other predictive models of the protocol will enable the development of applications that enhance the capabilities of horse racing games and sports prediction enthusiasts.

5.2 The NORA Token

5.2.1 Fuel of the Ecosystem

NORA is an ERC20 token issued on BSC (Binance Smart Chain). The NORA token as centerpiece of the entire NORACLE economy will have utility in all Dapps and games in the ecosystem. The amount of activity in all of these applications will have a direct impact on the value of NORA. For example, in the NORA642 game, users will be able to purchase game items in NORA, and specific actions will require the user to have a certain amount of net NORA deposited in the ecosystem's staking pool. Each token holder’s net deposit is obtained by subtracting their total number of NORA Rewards Claimed (NR) from their total amount of NORA deposited in the user’s active Staking Pool (the set of all active user’s stakes under the used crypto address).

$$Net\ Deposit = Total\ Deposit - Claimed\ NORA\ Rewards$$

5.2.2 Daily ROI Token

The protocol implements an ingenious Staking/Rewards mechanism that gives any user a real incentive to actively participate in the security and growth of the ecosystem, while at the same time ensuring the sustainability of its model. Furthermore, it is worth mentioning the double rewards system where the user receives rewards in NORA (NR) and BNB (Ecosystem Rewards or ER) at the same time, depending on the proportion of NORA staked. When the user makes a deposit (Stake), the protocol immediately starts producing daily NR rewards for this stake at a rate depending on the chosen staking period. The user can claim his generated NR rewards at any time to have free access to them, or he can choose to redeposit them in another Stake. Thus, no one must wait till the end of the staking period before claiming their NR rewards. ER Rewards, on the other hand, are always generated based on the user's overall net deposit, and they can also be claimed at any time.

Before staking, each user can choose between a 90-, 180-, 270- or 360-day staking period for their stake. A stake is active immediately after deposit and remains active until the end of the

staking period, meaning, as long as it produces rewards. A user can have up to 10 active stakes concurrently per address. If an address reaches this threshold of 10 active stakes, the user will not be able to (re)deposit under that address until the staking period of one of the active stakes ends.

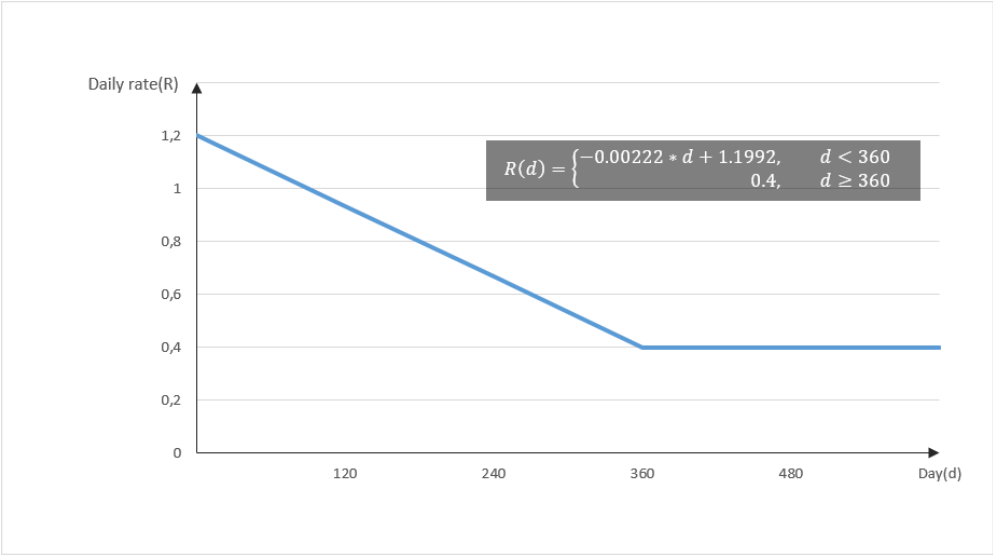

Figure 1. Graphic showing the daily NORA rewards rate

The reference daily ROI for staked tokens in NORACLE starts with a rate of 1.2% on day one. This rate slightly decreases linearly over the first year after the staking launch date, to reach a constant optimum of 0.4% daily ROI rate on the staked NORA. This reward strategy is designed to highly incentivize the early adopters to support the ecosystem in his infancy while establishing an optimal rewards rate which will ultimately ensure the sustainability of the whole ecosystem over time. Figure 1 shows the graphic and formula that governs the daily NORA rewards rate for the reference use case where a stake is created for a period of 360 days.

The daily reference rate indicates exactly what percentage of NORA is produced daily for a deposit over a 360-day period. This rate adjusts depending on whether the user chooses a staking period shorter than 360 days. In concrete terms, let's take the example of a user who deposits 100 NORA on the day the staking feature is launched. The daily reference rates of 1.2% from the first day to 0.4% on the 360th day of staking apply. Thus, this user will have accumulated 288 NORA in rewards after 360 days, i.e., at the end of his stake's activity. If instead of 360 days, the user chooses 270 days of staking, the daily rates would adjust so that he would receive 241 NORA at the end of 270 days, for 180 days of staking he would receive 194 NORA, and for 90 days of staking he would receive 147 NORA in rewards. One year after the unveiling of the staking feature, a user who deposits 100 NORA for a 360-day staking period will receive 144 NORA in rewards, based on the same benchmark rate, etc.

The staking of NORA tokens, the claiming, and redepositing of the NORA rewards take place in the Staking/Rewards section of the Dapp (Decentralized Application). In the same section, players can also claim their Ecosystem Rewards (ER) in BNB. Staking in NORACLE is synonymous with depositing NORA in the staking pool (the well) to earn both the NORA rewards (NR) and the Ecosystem rewards (ER). In an overview, the user can always see his

total deposits, the number of his currently active stakes and the details hereof, his currently available rewards, and the NORA rewards claimed so far from his active stakes. The Net Deposit of a user is an important value in the calculation of his Ecosystem rewards in BNB. It is obtained for each address by subtracting its claimed NR from its total deposits. At the time of distribution of the Ecosystem rewards, NORACLE evaluates the weight of each address and allocates the ER proportionally. The weight of an address represents the ratio of its Net Deposit to the global Net Deposit in the whole ecosystem. This weight equals 0 if the Net Deposit is negative or equal to 0.

NORACLE is just as suit for player type, investor type and player-investor type as well. One ingenious strategy for people willing to play and stake is to apply a so called 50/50 strategy, which means to play with 50% of the budget the user is willing to invest into the NORACLE ecosystem and to stake the remaining 50%. The player would likely have an interesting all in one ROI either because he would have won big playing the NORACLE games or because his daily NORA rewards (NR) would have amounted to a multiple of his initially staked amount, and his ecosystem rewards (ER) would have been consistently paid daily as thousand and millions of players around the world participate into the ecosystem games and Dapps. Each user is free to apply the strategy that suits him/her to play and/or invest.

5.2.3 An asymptotic max supply

As per the NORA tokenomics, the initial circulating supply amounts to around 5 million NORA at the time of TGE (Token Generation Event). Despite the high staking reward rate offered by the ecosystem, mechanisms for redeeming tokens in circulation through the Bitcoin and BNB reserve, coupled with token burning, should maintain a sustainable total supply of up to 120 million tokens long-term. These mechanisms will have been fully implemented in smart contracts at the time the ecosystem will reach full autonomy as a DAO. In the meantime, the mechanism regulated by smart contract to reduce the supply is the token burning by staking, and the remaining regulating actions are carried by Noracle Labs in the best interest of the ecosystem.

All these regulating mechanisms will aim at establishing the said maximum supply as an asymptote for the ecosystem, so that the circulating supply at any moment in the future never reaches 120 million tokens, or never goes far beyond this asymptote. This promise is of course based on the assumption that the ecosystem's Dapps and games have an excellent adoption in the medium and long term.

All staked tokens are effectively burned and are no more part of the total supply from the moment they have been staked. By depositing NORA in the staking pool, the user explicitly consents to the burning of these tokens in exchange for Ecosystem Rewards (ER) in BNB, and for Rewards in NORA which, in any case, will be at the end of the staking period, in numbers greater than the quantity initially staked.

5.2.4 Acquisition and ecosystem fees

NORA tokens will be available on DEXes (Decentralized Exchanges) such as Quickswap, Uniswap, or any other exchange having a listing partnership with Noracle Labs. Moreover, any claimed or acquired NORA can be freely transferred between wallet addresses without any transfer taxes. Furthermore, there are no whale taxes in the NORACLE protocol because it is much interesting to let the healthy growth of the ecosystem be achieved through mass usage rather than by discouraging sales through wallet-specific taxes.

The only fees natively implemented in the protocol for transactions are 10% for claiming and 5% for redepositing of NORA tokens. These fees will directly serve the harmonious development and growth of the NORACLE ecosystem.

An essential feature of NORACLE is the fountain from which NORA is drawn for Rewards (NR). 75% of the fees collected in NORA at claiming or redepositing are returned to this fountain. New NORA is only minted and added to the fountain if its capacity is not sufficient to pay all the current rewards. This is the sole token issuance mechanism in the protocol. 20% of the fees are distributed as referral rewards, and 5% are paid into the Noracle Labs fund to support the continued development of the ecosystem. Part of Noracle Labs' revenue comes from this fund, which is made up of this portion of the ecosystem native fees, and 50% of the Ecosystem Rewards (ER) generated by the NORA tokens staked in the black hole (see next section). The other 50% of ER generated by the black hole is added to the ecosystem reserve.

A portion of the fees is paid as referral rewards to the referrer only if he or she has a net deposit of at least 100 NORA. In this case, both the referrer and the referred user will receive an equal share of the 20% of the fees dedicated to referral rewards for a period of one year from the date the referral begins. If the user does not have a referrer, or if the referrer does not meet the minimum 100 NORA net deposit requirement, or if the one-year referral period has passed, then the 20% also goes into the Noracle Labs fund.

6. Tokenomics

The initial distribution of NORA tokens is illustrated on Diagram 3. There will be a total supply of 70 million NORA at TGE (Token Generation Event). Through the token dynamics explained throughout this whitepaper, the total supply is subject to evolve in both direction (increasing or decreasing) over time. However, a maximum of 120 million NORA tokens corresponding to what we referred to above as asymptotic max supply will serve as a benchmark for the whole ecosystem dynamics. Strictly speaking, this is not the max supply defined as the total quantity of tokens that will ever be minted by the protocol, but rather a quantity that the protocol must maintain as the maximum total supply by various mechanisms. For example, the so-called black hole (the biggest piece of cake on the diagram) initially contains 50 million NORA forever locked, and it is at the heart of one of these supply regulating mechanisms aiming at ensuring the scarcity of the tokens.

The pool of 50 million tokens initially locked is what will ensure that the ecosystem generates reserves in BNB and BTC. All tokens that land in this pool are forever locked and burnt like the

initial 50 million ones, and will always be considered as net deposits, since they do not generate NORA Rewards (NR). However, like any other net deposits, they do generate ecosystem rewards in BNB (ER). These BNB coins are part of the ecosystem reserve and can be partly used to acquire BTC that are also placed in the reserve, as well as NORA that are added to the reserve. The NORACLE ecosystem reserve is thus made up of 3 different assets: BTC, BNB and NORA.

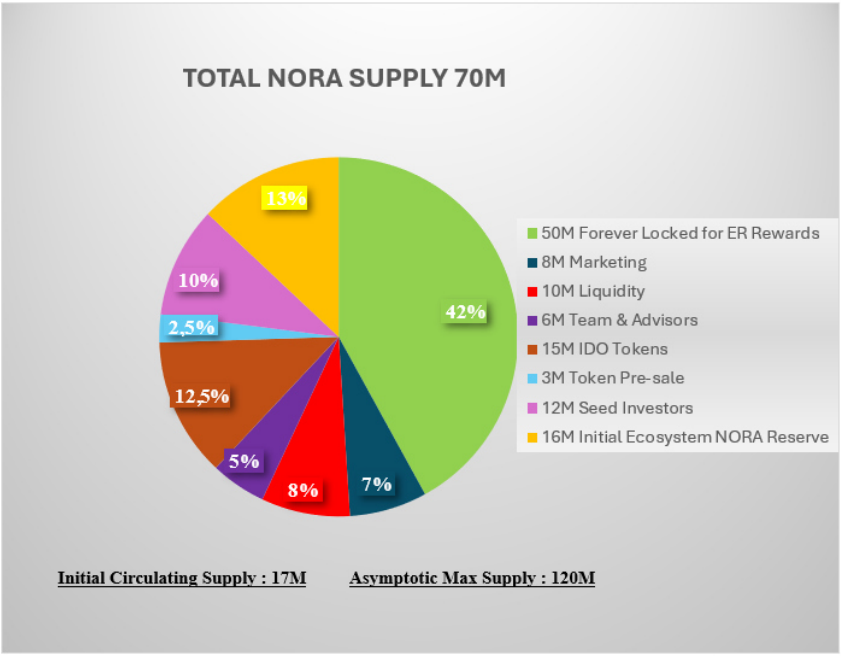

Diagram 3. The initial distribution of NORA tokens

BTC and BNB coins in the reserve have the essential function of periodic redemptions of outstanding NORA to swell the NORA reserve of the ecosystem. A large part of this NORA reserve is periodically transferred to the black hole, where they are locked and burnt, for the generation of ER. Thus, a tremendous amount of NORA in circulation is absorbed and burnt forever, creating scarcity. The systematization of the exploitation of the ecosystem's reserves to create scarcity as described above will occur when the ecosystem has fully reached a true DAO status. It is also at this time that another utility of NORA tokens will be integrated directly into the ecosystem: voting on the direction of the ecosystem where the weight of each vote will depend on the net deposit in the wallet of each voter.

The initial supply of the ecosystem reserve is 16 million NORA tokens which will be locked for 6 months post TGE. After this vesting period, these tokens will be progressively put into circulation at a maximum rate of 8% per month to balance the liquidity if needed. Post TGE, a total of 30 million tokens from the seed and token pre-sales will be released to the owners at a rate of 4,16% each week. 5% of the asymptotic max supply, meaning 6 million of NORA tokens are locked for 1 year post TGE, and will be distributed to the team and advisory board members at a rate of 8% per month after the vesting period.

At TGE, the initial circulating supply will be approximatively 5 million tokens consisting of 4,16% of the tokens from the seed and token pre-sales; 4,16% of the initial 4 million marketing budget, and 3.5 million tokens for the initial liquidity. Most of (if not all) tokens acquired at the seed and private investment stage of the ecosystem would have been available for the

owners addresses by the time the NORACLE staking feature is released (Q3 2023). Thus, all ecosystem early adopters will have the opportunity to fully benefit from the highest reward-rates by being among the first to stake their tokens in the protocol after the feature launch.

7. NORA642 Specifics

As mentioned earlier, NORACLE is a protocol open to the implementation of diverse prediction Dapps and games. Noracle Labs is implementing the prime game NORA642 as first out of a series of many more on top of the protocol. Basically, playing NORA642 is as simple as choosing 6 numbers out of the set of the natural numbers 1 to 42. The magic and the fun factor with NORA642 consist in the set of tools enabled by the protocol to let players experiencing many ways and perspectives to track and to model pattern built over time through the draws that take place on 08:30 PM UTC every day.

7.1 The game paths

There are several paths the user can consider to take part in the game. The goal is for the player to find and build the combinations that have the best chance of winning in the next draw. The player can use one or more paths to build their combinations and participate. Besides creating combinations to participate, there is also a path allowing a player to build noris just to take part in competitions with other players to win the prizes for the best performing noris by the next draw.

The very first path to build combinations is naturally to open a ticket and to choose their numbers fully or semi-randomly. The ticket shown in Figure 2 displays the information and action buttons the player can use to choose, complete, or delete the numbers. The player can fill or generate as many tickets as he wants to.

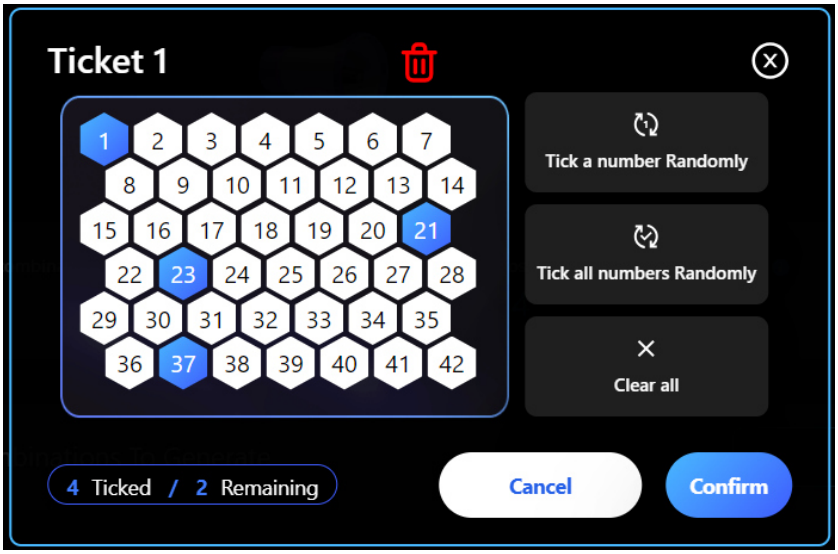

Figure 2. A ticket opened for editing

The next path lets the system generate as many tickets as the player wants based on the configuration of a set of options he chose through the path “building your nori.” There are up to 8 different options a user can choose to build his nori by configuring each of the choosing options. A nori is a set of configured options in NORA642. The configuration of each option considers all the configurations of the previous options including the constraints established so far. Once the user has built his nori, he can generate his tickets simply by indicating the number of tickets he wants to generate, and then pressing the button “Generate Tickets”. All tickets generated will match with all the criteria he has defined in the configurations of his nori. Through this mechanism, NORA642 allows the users to construct each sort of pattern for the choice of tickets’ numbers without time consuming efforts.

In the final step in the process of constructing a nori and generating corresponding tickets, there are key indicators the user can assess to check the nori’s status, meaning to see how much distinct tickets he can generate based on the nori along with the ratio of the said quantity to the total number of possible tickets without configuration. Further data shown in 2 different graphics also belong to these key indicators. These graphics are accessible through the button “Nori Evaluation”, and they give an overview on how good the current nori would have performed in the past hundred, and in the past ten draws. The first graph highlights quantities of draws matching the nori over the last 100 draws, and the second graph shows the course of the P-factors over the past 10 draws, based on the given nori. The P-factor (Probabilistic factor) indicates for a given nori, how much more likely a user would have achieved a win generating his combinations with the current nori, as compared to a purely random game play without configuration. In practical terms, considering Figure 4, the player would have had 3 times more chances to win building his tickets with the current nori for the draw on 20/10/2022 than to play randomly, and he would have had 4 times more chances to win with tickets built with the current nori for the draw on 17/10/2022.

Figure 3. Graphic evaluating the nori over the past 100 draws

The graphic “Compliance” groups the last 100 draws by 10, and shows in the Y-Axis, how much draws out of 10 are completely in accordance with the current nori. The illustrated graphic in Figure 3 should be interpreted as follows: Out of the last 10 draws, 5 were totally compliant with the nori, meaning the numbers drawn in each of them satisfy all the configured options of the nori; Out of the 10 draws between the eleventh and the twentieth last ones, none was

totally compliant with the nori; Out of the next block of 10 draws in the past (21st to 29th), 3 were totally compliant with the nori, and so on, till the last 100 draws are all so covered.

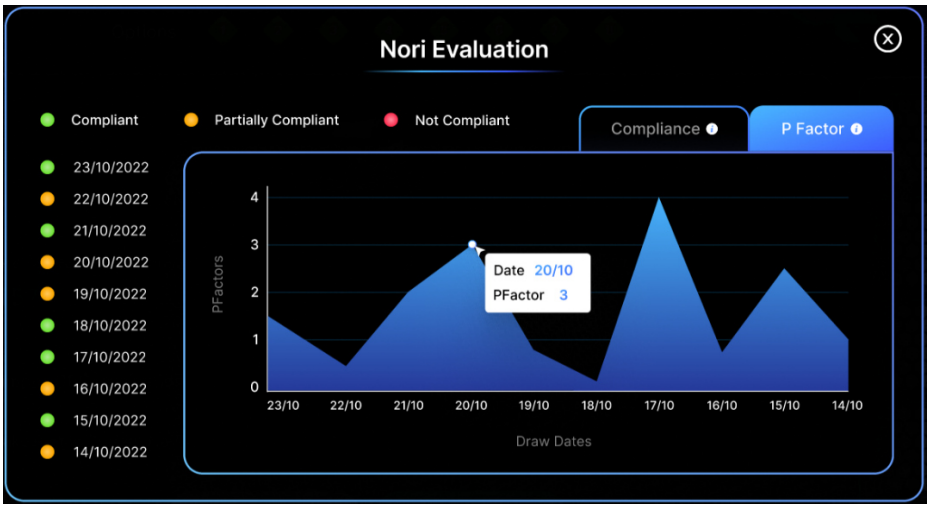

Figure 4. Graphic for the nori's P-Factors over the past 10 draws

On the left, next to the graphics, there is a set of 10 markers signaling the matching level of the current nori with each of the last 10 draws. If the marker is green, then the combination of the corresponding draw complies with all the configured options in the nori. If the marker is yellow, then there exists a minimum set of numbers within the combination of the corresponding draw which leads to one way to win and which complies with the nori. If the marker is red, then there is no set of numbers within the combination of the corresponding draw which leads to one way to win and which complies with the nori.

The specificity of each of the 8 possible options in a nori is explained throughout the play steps. The configuration process as such is as simple as selecting or unselecting numbers, either in containers filled with the possible numbers like in Figure 5 & Figure 6 illustrating configuration of options where numbers can be excluded from - or prioritized in, respectively - any combination that will be generated, or in a set of dropdown elements to define filter criteria applying to each generated combination (Figure 7).

Figure 5. Configuration of the option "Exclude Numbers"

Figure 6. Configuration of the option "Prioritize Group Of Numbers"

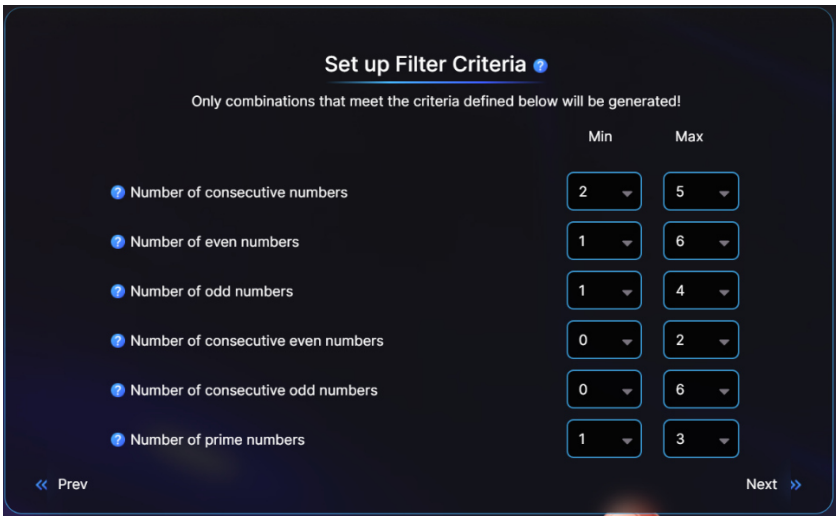

Figure 7. Configuration of the option to set up filter criteria

The third alternative a player can walk through to participate is by choosing the "Quick Pick" method that would lead to a page where the player just enters the quantity of tickets he wants to generate. This way, the NORA642 generation engine would randomly generate all the tickets without following any other configured option than the first one, i.e., without constraints except that all tickets would need to be distinct (no 2 generated tickets could possibly have exact the same 6 numbers).

In the event that the player doesn't want to build a nori by himself or to use the "Quick Pick" alternative, there is also the possibility to use a nori someone else has built. In this case, there is a small fee the player would pay to the builder of the nori used. NORACLE enforces this payment to the author account so that he can claim the collected fees to his wallet as he wishes.

The next path to participating in the game is related to the previous one. Players can use noris other players have built, which means that NORA642 offers the possibility to build noris for sale. Any user can achieve this by going through the process "Sell a Nori". This opens the page to choose options and configure them like for any other nori. The process is finished when the player hits the button to propose the nori for sale and confirms his proposition. Key data of all

the noris proposed for sale by the next draw are listed in a table that is displayed to players willing to use predefined noris by hitting the button “Use a Nori”. With the “Sell a Nori » path, users can participate in the game without spending any coins, just by selling a nori freely built and offered. The more players find a nori interesting and use it, the more coins the nori builder will earn.

Within NORA642, you can win either because you were lucky enough to have your chosen or generated numbers drawn, or because you had one of the best strategies for setting up the numeric oracle, i.e., you built a nori that got a high score in the draw. Noris competitions take place with each draw every day. There are 2 ways to qualify a nori for the next competition: either by selecting the checkbox “Take Part In Current Nori Competition?” before purchasing tickets generated with a nori built in the “Build a Nori” path, or by going through the “Competition” sidebar menu.

7.2 Competitions

In addition to the calculation of all winning tickets after each draw, the calculation of all noric scores is also carried out to determine which of the noris proposed to the competition had the best scores. The score of a nori is determined according to the considered draw and takes into account data on the ratio of the number of possible combinations, the compliance degree (CDG) and the P-Factor. The compliance degree indicates the maximum number of numbers in the draw that could have happened in a combination complying with the nori. The smaller the ratio is, and the larger the compliance degree and PFactor are, the higher the noric score will be. The noric score (NS) is calculated exactly as follows:

$$NS = \frac{CDG \ \times PFactor}{Ratio}$$

At the end of the nori evaluation, the winners are ranked into 5 tiers. These are determined as follows: The integer part of the highest noric score is considered and all following scores with the same integer part are included in the first tier along with the first score. Next comes the highest score with a lower integer part than in the first tier. All the following scores with this last integer part belong to the second tier. The algorithm continues in this way until the winners in the 5th tier are determined.

As described in the previous subchapter, the player can participate in noris competitions in 2 ways, either through the Checkbox in the final step of a nori building, or by going through the sidebar menu “Competition”. This menu opens the configuration page where the player builds a nori just like any other and submit it to the competition at the end.

7.3 Statistics

There is a graphic showing the distribution of numbers in the past 10 to 100 draws for players to have an immediate feeling about the occurrence frequencies when configuring a nori. But,

more broadly, the sidebar menu “Statistics” is dedicated to an overview of several statistic perspectives on the numbers occurred in all the past draws. One can distinguish there between basic statistics on individual Numbers, and advanced statistics that consider Numbers in relation to each other. The player can always set or adjust the parameters in the statistics panel to obtain the statistics for the range of draws and/or range of numbers he needs.

Statistics can be used as a basis for analysis by the user to build noris for ticket generation or to participate in nori competitions. Careful analysis of the statistics can result in the production of noris with very good scores on the draws of a given time interval, or noris with a good noric weight. The noric weight is another indicator of the quality of a nori. It considers the last 100 draws, unlike the noric score which is always based on a given draw as you can see in its formula in the previous subsection.

The noric weight is an indicator on the value of the nori brought back to the last 100 draws. This value allows for example to classify the nori proposed for sale according to their weight on the last 100 draws. The noric weight (NW) formula is as follows:

$$NW = \frac{\sum_{i=1}^{100} c_i}{Ratio^2}$$

c_i takes the value 1 if the ith draw is fully compliant with the nori, otherwise its value is 0. Thus, the dividend in the noric weight formula indicates the quantity of draws out of the last 100 which are fully compliant with the nori, and the divisor is the square of the ratio of the number of possible combinations. The smaller the ratio and the greater the number of draws fully compliant with the nori, the greater the resulting weight of the nori.

7.4 Winners board

When the sidebar menu “Winners” is activated, the winners and prizes are displayed for both the winning tickets and the noris competition. There are even more details such as the winning tickets or the nori’s details to show if the user clicks one of the numbers in the column “Total Winners”.

Figure 8. Overview of the winners board

7.5 Player dashboard

Each player can see an overview of his historical game tickets and results using the sidebar menu “My Games”. Within the tickets’ details page, there is the possibility to reuse tickets and/or the nori that had been used to generate them.

7.6 Live drawings

Players have the possibility to watch a live simulation of the drawings taking place within the Chainlink VRF (Verifiable Random Function) generator engine. This approach ensures full transparency as a cryptographic proof of how the random values are determined is published and verifiable on-chain. This way, the fairness of the draws can be verified live by every user, and the results cannot be tampered with or manipulated by any single entity.

Inside the sidebar menu “Live Drawings”, a countdown to the next draw is provided as well, and players can see it while no drawing is taking place. When the time of the draw comes, the frame content automatically switches to the live simulation, and live on-chain information is displayed while the balls are being randomly picked based on the events in the Chainlink VRF.

8. Technological background

A technique using the concept of instability in fuzzy sets was described in the patent US8727859B2[7], allowing the adaptation of a theory that has proven itself in the selection and risk prevention, to random phenomena. A mode of realization of the invention already introduced the idea of leveraging this technique to systematically build randomly generated numbers by searching subsets with low volatility, which are supposed to expose optimum numbers. A beautiful aspect of the technique was to present a very intuitive and interactive process which additionally enables individual and collaborative playing experiences.

All rights to use the invention was transferred to NORACLE Labs by the Germany based company Youpi24, so that any of its embodiments can be implemented in any game or Dapp built on top of the NORACLE protocol. NORA642 uses the underlined techniques to implement the process through which noris are built in the game.

Youpi24 also implemented a prototype that can be used to build configurations and generate tickets for any prediction game where a subset of *x* numbers must be chosen out of a total of *y*. This also applies to games with special extensions, with jokers or extra numbers. Youpi24 also transferred the rights to extend and adapt the prototype to implement the nori building process in NORA642.

9. Towards a full-fledged DAO ecosystem

As mentioned above, the NORACLE ecosystem will evolve towards a full DAO (Decentralized Autonomous Organization) over time. The full implementation of the DAO features will mark a key milestone in the development of the ecosystem as token holders will be able to issue NIP (NORACLE Improvement Proposal), and actively participate in decisions that shape the ecosystem's future. The voting power of each participant will be proportional to their net deposit in the staking pool.

The NORACLE ecosystem in the first stage will consist of a semi-decentralized community of dapps users and token holders where Noracle Labs overtakes a central role in the orientation of the ecosystem activities. The weight of Noracle Labs is bound to decrease in the ecosystem over time as more and more elements will be decentralized to the token holders.

Token holders will exercise voting rights on key aspects of the ecosystem functioning to reach consensus on topics like the allocation of the revenue generated by the ecosystem games and dapps, the daily rewards rate, the fees natively applied within the ecosystem, the systematization of redemptions of NORA in circulation, all decisions as to the exact use of the ecosystem reserves, to name a few.

10. Team

The core team behind the planning, design, implementation, and marketing of the nascent protocol collaborates under the umbrella of Noracle Labs. The management under the leadership of Mr. Hugues N. Wandji, Entrepreneur and CEO of the Germany based company Youpi24 GmbH, consists of experts in Information Technology, engineering, Blockchain, Artificial Intelligence, Gaming, and Marketing business. Furthermore, another six people are currently providing significant contributions to the development in UI/UX area, in backend, frontend, and blockchain core development. Community managers and business developers will join the team soon to take the notoriety of the protocol to the next level.

11. Roadmap

STEP 1
- Project study & Research
- Rough design
- Proof of concept
- Seed investment 1

STEP 2
- Refined design
- Team Building
- License acquisition from Youpi24
- Protocol development
- Design NORA642 Game

STEP 3
- NORA642 Prototyping
- Whitepaper
- Smart contracts design
- Seed investment 2

STEP 4
- Protocol Development
- Community building
- Strategic Token Pre-Sale
- NORA public pre-sale

STEP 5
- Release of NORA642
- Token Generation Event (TGE)
- Listing in DEXes and coin trackers
- Partnerships, CEX listings
- Marketing & PR Strategy

STEP 6
- Staking features release
- Release of Ecosystem Rewards
- Further CEX listings

STEP 7
- Review of prediction models for Sports Events
- Release of NORABETS
- Partnerships & More Games

STEP 8
- Review of financial predictive models
- Integration of financial predictive models
- Ecosystem DApps using financial predictive models

STEP 9
- Review of predictive models for metaverse games
- Integration of predictive models for the metaverse
- Release of NDRACE
- Further metaverse Games using Noracle predictive models

STEP 10
- Development of DAO features
- More predictive models integration
- Further protocol consolidation

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