OpenChat

oc.app/whitepaper

1) Product / Service Overview

OpenChat is a fully featured chat application running on the Internet Computer blockchain similar to WhatsApp, Signal and Telegram, and will soon be getting a major new capability called "communities" which are like Slack workspaces or Discord servers.

It is a responsive, progressive web application (PWA) and as such scales to take advantage of any screen size and integrates with devices in a similar way to native apps, with notifications on desktop and Android devices, and on iOS from next year

. You can find the full development roadmap here .
The app is open source

and runs as a collection of canister smart-contracts. It is possible to see the code running on any canister at any time with a link back to the particular version in source control and to independently verify this is true.
A canister is created for each user which holds their direct chat data, links to the groups they are members of, and also serves as a wallet allowing OpenChat users to hold and manage tokens. Each group (and soon "community") is also implemented as its own canister. This architecture will allow OpenChat to scale to every person on the planet. For details of the architecture please see here.

OpenChat users can send messages to each other containing tokens such as ICP and BTC and so can be used for global remittance.

However, the ground-breaking difference between OpenChat and other similar apps, is that it will soon be governed as a DAO with its own token called CHAT, analogous to ICP. The DAO will be realized by a system called the SNS

(Service Nervous System) analogous to the NNS

(Network Nervous System) on the Internet Computer.
The focus of the founding dev team has been first and foremost on building a rich, fully featured chat app on par with its web2 counterparts. Only by first building an app that people are happy to use will the rocket fuel of tokenization enable OpenChat to grow and challenge monopolistic big tech incumbents.

2) Internet Computer Overview

The Internet Computer

(IC) is a decentralized global compute platform which uses ground-breaking blockchain technology to achieve consensus within subnets. It is globally distributed in numerous independent data centers, is tamper proof and unstoppable.
It can serve applications fully on-chain without needing any centralized frontend layer. It is extremely efficient and is several orders of magnitude cheaper to run and store data than most other blockchains. It uses a reverse-gas model so computation and storage costs are paid by the app/service providers rather than users.

Canister smart-contracts

Applications on the IC are composed of canister smart-contracts organized into subnets. A subnet can contain 100,000s of canisters and is composed of (typically 13) node machines each of which runs in a different independent data center around the globe such that the nodes within each subnet are as geographically and jurisdictionally diverse as possible. Canisters can communicate securely with canisters on other subnets allowing the IC to scale horizontally.

A canister runs on a virtual machine (as a WASM) that is replicated across a subnet. It implements the actor model, and so is single threaded, processing a queue of input messages one at a time, optionally sending messages to other canisters, and adding a response message to an output queue.

It can be called by clients (or other canisters) using queries or updates. A query can be served immediately from any node but cannot change state. An update can change state and goes through a process of consensus for the nodes to agree on the same result before responding to the caller. Achieving consensus is where the blockchain comes into play but is beyond the scope of this document.

Canisters have the property of orthogonal persistence

which means as a programmer you just write data objects to memory and they are automatically persisted by the system. This removes the need for a database and is one of the reasons writing and running applications on the IC is simplified compared to traditional IT stacks.

Network Nervous System (NNS)

A key feature of the Internet Computer blockchain is the Network Nervous System (NNS), an open algorithmic governance system that oversees the network and the token economics.

Holders of the Internet Computer's ICP utility tokens can lock their tokens in neurons to participate in governance and contribute to decision-making, such as voting to determine whether or not a new subnet should be added to the network. By participating in governance, voters earn rewards which can be converted to ICP. In turn they can burn ICP to fuel the computation of their canisters.

Read here

for more information on the NNS.

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3) OpenChat DAO

Summary

- The OpenChat DAO is being formed to operate and steer the direction of OpenChat which should be considered a public good, thus owned by no-one.
- The OpenChat DAO and the OpenChat service are fully on-chain with no direct dependencies on off-chain services.
- The OpenChat DAO is operated using NNS blessed SNS canisters and SNS subnet.
- A proposal to the NNS will be made to ask for the approval necessary to create this DAO and associated public good.

Creation of the DAO

The OpenChat SNS will be created from the latest NNS blessed SNS canisters by the founding dev team. Its initial configuration will be held permanently by the SNS and be publicly inspectable. At this point control of the existing OpenChat operating canisters will be transferred from the founding dev team to the SNS, such that, henceforth, only the SNS may change OpenChat.

To initiate creation of the OpenChat DAO an NNS proposal will be submitted specifying the parameters of the decentralization sale and an initial token allocation. If the proposal is accepted the NNS will immediately start a decentralization sale of CHAT tokens based on this proposal, to decentralize governance control to the public and raise an endowment for ongoing development and growth.

Anyone can take part in the sale by depositing ICP into the SNS using the NNS launchpad. Once the sale has completed each investor will receive the same proportion of CHAT tokens as their share of the ICP deposited and the proceeds of the sale will be held in an ICP ledger account owned by the SNS governance canister.

At this point the DAO creation is completed and the running OpenChat service should be considered a public good.

Control of the DAO

After the decentralization sale the SNS will be in control of the dapp including its treasury of CHAT and ICP. In other words, only the SNS will be able to upgrade the OpenChat canisters and only the SNS will have access to its treasury.

The SNS is itself controlled by the action of proposals. Anyone can submit a proposal to the SNS and then CHAT neuron holders can vote on these proposals.

In exceptional circumstances an NNS proposal could theoretically be used to sanction an SNS by stopping an SNS canister(s). One example could be if an IC app were to copy the source code of another IC app, breaking its licensing terms.

Governance of the DAO

Proposals

SNS proposals have the following types.

- **Motions** are statements of intent but do not have any actual action that is automatically taken if they succeed. They could be used, for example, to propose new features or capabilities for development or to set the dev team's priorities.
- **Canister upgrade** proposals contain a canister Id and a wasm module and instruct the SNS to upgrade the specified canister's code to the wasm module. This can be used to upgrade dapp canisters controlled by the SNS and the SNS canisters themselves.
- **SNS config change** proposals allow various SNS parameters to be changed. Part of the boot-strapping process for the SNS is to provide initial values for all of these parameters which will be covered later.
- **Token transfer** proposals allow tokens to be transferred to/from the specified SNS owned account. The SNS "treasury" can potentially include any IC native token such as ICP, not just CHAT, and so this proposal can be used to transfer any IC native token.
- **Burn token** proposals will allow CHAT to be burned to reduce the total supply.
- **Custom function** proposals allow for an arbitrary function to be called on a given canister by the SNS governance canister. In practice this allows for arbitrarily complex behavior to be controlled by the OpenChat community DAO. Some examples of custom functions:
  - **Buy cycles**. By calling an API on the NNS cycles minting canister a proposal can burn ICP for cycles to pay for the running of the dapp.
  - **Rolling upgrade**. By calling an upgrade method on an OpenChat canister the proposal can provide a canister WASM + version number and initiate a rolling upgrade of say the User canisters.

There will be some proposals to look out for soon after the decentralization sale including...

- One or more proposals to transfer some ICP and CHAT to one or more DEXes

  to create initial liquidity pools to enable trading of CHAT
- The core dev team will engage with the community and then use a motion proposal with a development roadmap for the following quarter which will likely include designing and building the communities feature and/or a user reward system.

Voting and voting rewards

Proposals are used to govern all aspects of the OpenChat dapp. Token holders are rewarded for participating in votes on proposals so that decisions are decentralized and reflect the will of the community.

Neurons have a property called dissolve delay which is the length of time it would take to dissolve the neuron into liquid tokens. Voting rewards increase with longer dissolve delay which aligns voters with the long term interests of OpenChat.

If CHAT is staked in a neuron with a dissolve delay set to at least 1 month then this neuron can be used to vote on proposals.

You can either vote on a proposal with a neuron(s) explicitly using the NNS Dapp (which will soon have a section for SNS's) or the "OpenChat Proposals" group within the OpenChat dapp, or you can configure your neuron to follow another neuron(s) per proposal type, in which case your vote will be implicitly cast when it votes. By default, newly created neurons will have no followees so this would need to be manually configured. There will be at least one neuron pre-configured as a named followee which itself will follow the neurons of the founding dev team. Anyone is able to propose additional named neurons to be added to the SNS.

Each neuron has "voting power" which is calculated as the token value multiplied by the dissolve delay bonus multiplied by the age bonus. The dissolve delay bonus starts at 1x with zero dissolve delay and linearly increases up to 2x for neurons with the maximum 1 year dissolve delay. The age bonus starts at 1x at zero age and linearly increases up to 1.25x for the maximum 6 months age. This means for neurons with the same value, those that have spent 6 months with a dissolve delay of 1 year will have a voting power 2.5x those with a newly set 1 month dissolve delay.

For a proposal to be adopted the sum of the voting power of the "adopt" votes must exceed the sum of the voting power of the "reject" votes after 4 days or after a period of quiet. Also the "adopt" votes must have at least 3% of the total voting power. The vote will end immediately if either the "adopt" or "reject" votes exceed 50% of available voting power. It is possible to participate in a vote for a proposal if still within the 4 day period even if it has already been resolved. This is so the neuron can still be a beneficiary of voting rewards.

Voting rewards are generated by the SNS and accumulate in neurons that have participated in voting as maturity. Maturity can be disbursed to an account according to maturity modulation

Alternatively it can be staked or auto-staked. For a given proposal vote, the voting reward earned by a given neuron is in proportion to its voting power compared to the overall voting power of participating neurons. The voting rewards are distributed daily and take into account all of the votes that ended on that day. If there are no proposals on a given day the rewards are carried over to the next day. The proportion of total token supply that is generated annually for voting rewards is 5%. In practice, given that much of the supply will not be in voting neurons, a neuron with a 1 year dissolve delay would expect a voting reward significantly higher than this figure.
Please refer to this document

for a full description of SNS voting and rewards.

The power of the DAO

There are many factors which will influence the success of OpenChat. It must have a great development team building an app with a great user experience. It must have the standard features expected of a chat app and new capabilities and properties which set it apart from the competition. But even when getting all this right it is hard to break into a market with such established players. A crucial ingredient available to OpenChat to help it succeed is *tokenization*.

Growth

The OpenChat system will automatically reward users with CHAT tokens for using the app positively and for inviting friends and family to join if they also go on to use the app positively. This improves the user experience by encouraging positive behavior and also builds an exponential viral growth loop. Users rewarded with CHAT tokens are invested in the future success of OpenChat and so a powerful team of 100,000s of advocates is created helping drive growth further.

Trust

An essential condition for tokenization to be viable in the first place is *trust*. OpenChat runs on the Internet Computer, a decentralized, unstoppable software platform with decentralized governance using the NNS. OpenChat will itself be controlled by a DAO which is aligned to its long-term success. Even the process of creating the DAO, with a *decentralization sale* proposed to the NNS and then started automatically by the NNS, ensures there is no foul play. All this means that token holders can trust their investment is secure.

4) Purpose of the CHAT utility token

- It can be staked as neurons (very similar to ICP neurons) allowing token holders to participate in the governance of OpenChat by voting on SNS proposals, and by doing so, earn voting rewards. These rewards increase the longer the tokens are staked and so token holders are incentivised to act in the long term interests of OpenChat.
- It can be used by OpenChat users to pay for premium features.
- It can be used to reward contributions to the evolution or growth of the OpenChat service either through automated user rewards or by SNS proposal.

Premium features

There are many ways OpenChat could evolve to allow users to spend their CHAT tokens to pay for premium features within the dapp. It is likely the underlying price for premium features will be in CYCLES because these have a stable value (relative to XDR

) and then based on the exchange rate of CHAT->ICP (which we can request from DEXes) and the exchange rate of ICP->CYCLES (obtained by calling the cycles minting canister on the NNS subnet) we will provide a dynamic price for features in CHAT tokens.
To pay for a feature a user would need to have first deposited CHAT tokens to their OpenChat user canister which acts as a wallet. OpenChat will transfer the payment from the user's canister to the SNS treasury account and then grant the feature.

Current premium features

There are already some premium features that OpenChat offers which for the time being can be obtained either by paying with ICP or verifying a phone number.

- Storage for uploading/sending/storing "file" messages such as images and videos
- On demand message translation
- Increased group creation limit from 10 to 25

Communities

A key feature we are planning to build soon is called "communities". These will be like Slack workspaces or Discord servers and consist of a set of users, groups, and configuration. We will aim to provide a way to import existing Slack workspaces and Discord servers into OpenChat communities. Initially we will focus on encouraging IC communities to migrate to OpenChat, following that, the wider crypto space, before ultimately everyone else. There are various ways communities could be monetised, the most simple being to charge per user. Community owners themselves could potentially monetise their communities and revenue share with OpenChat by, for example, charging for admittance to a community.

Other possible future premium features

Here are some more features that OpenChat could offer and charge for in the future.

- Custom reactions, themes, stickers etc
- OpenChat NFTs
- Short usernames
- Voice and video chat
- 'Featured' public groups / communities
- Custom bots (e.g. a bot controlled chat could support token swaps using messages)

Additional potential revenue

- Provide chat functionality to other IC apps with an OpenChat integration
- Transaction charge on sending tokens as messages
- Transaction charge to use an integrated token swap service

User rewards

The design of the user reward system has not been confirmed yet and we will consult with the OpenChat community before finalizing the design and making a proposal to carry it out. This system can of course evolve over time with further proposals. Once it is ready, a proposal will be made to transfer the reserved 38% of the CHAT from the SNS governance canister to the OpenChat root canister where it will be available to OpenChat to algorithmically reward dapp users.

There are challenges to creating an effective reward system. The aim is to incentivise usage and growth of OpenChat, and ultimately the value of the CHAT token, by rewarding users who further that goal. One significant hurdle is that with a financial reward there is an incentive for unscrupulous users to try to game the system and "farm" CHAT tokens by creating multiple accounts with spam content. This challenge is made harder still because any system designed to reward users will, like all OpenChat code, be open source and visible to anyone.

User reputation

We think a reward system should be based on reputation. Each user would have a reputation score taking into account positive and negative activity on the dapp. Positive signals could include inviting other users (if they themselves go on to gain a sufficiently high reputation), owner/admin of popular groups, sending messages and reactions, moderating content and users, etc. Negative signals could include cross-posting, sending spam messages, creating multiple accounts etc. We expect to add a feature to allow users to mark messages as spam (or more generally unwanted content).

We can also derive a positive signal for a user if they hold tokens (ICP, CHAT, BTC) in their OpenChat account, or even better, neurons.

Rewards

The reward algorithm can use reputation to determine which users are rewarded and the value of the reward. We could either give a small reward to lots of users or larger rewards to a smaller group perhaps where you get entered into a lottery if your reputation is high enough, or a combination of both. The advantage to having larger rewards is that those users are more likely to become strong advocates for the long term success of OpenChat whereas a small reward might not provide sufficient incentive.

If a user qualifies for a reward, CHAT tokens will be transferred from the OpenChat root canister to their OpenChat user canister. Using the dapp the user can then access their CHAT tokens and send some to other users, withdraw them to sell on an exchange, or buy premium features. Using the SNS UI users will also be able to stake their CHAT as neurons, take part in OpenChat governance and earn voting rewards.

5) Token allocation at SNS genesis

Initial token allocation

The SNS will be initialized with 1 billion CHAT tokens allocated in the following proportions.

NNS controlled (yellow)

The NNS will initially be allocated 29% of the total supply of CHAT tokens. 20% will be immediately put up for sale to decentralize the governance and raise funds. The remaining 9% will be held in reserve until some future time when there would be a subsequent NNS proposal to either sell the reserve or burn it.

Investors in the decentralization sale will deposit ICP into the SNS and once the sale has completed they will receive the same proportion of CHAT tokens as their share of the ICP deposited. Each investor will receive their CHAT as a basket of 13 equal value neurons. The first neuron will have a zero dissolve delay and so be immediately disbursable to liquid CHAT tokens. Each subsequent neuron will have a dissolve delay one month greater than the previous, so from 1-12 months.

Founders and funders (pink)

OpenChat has been built by a team of 3 developers since January 2021 and has received seed funding from the DFINITY foundation

. Each of the 3 founding developers will be allocated a share of 4% of the CHAT tokens and the DFINITY foundation will be allocated a share of 6%. As above each party will receive their share as a basket of 13 equal value neurons, the first liquid and the rest with dissolve delays increasing from 1-12 months. However there are two special properties unique to these "founding dev team and seed funder" neurons.

Firstly, they are configured so that their voting power is reduced as a proportion of the CHAT sold out of the total reserve for sale. In the case of OpenChat we are selling 20% out of a total sale reserve of 29% so each founding dev team & seed funder neuron will have its voting power reduced by a factor of 20/29 (about 69%). If there was a future sale for a further 5% of the reserve then the voting power of these neurons would increase to 25/29 of the standard value. This is so that the **voting power of the founding dev team and seed funders is less than the voting power held by the rest of the community** . It also means the voting rewards of these neurons are reduced in the same proportion, and furthermore, if they are disbursed before all of the reserve has been sold, only that same proportion of liquid CHAT will be given.

Secondly, these neurons will have an additional lockup (or vesting) period before they can even start to dissolve (this doesn't affect the 1st neuron because it is already dissolved). The DFINITY foundation neurons will have a vesting period of 1 year and the dev team neurons will have a vesting period of 3 years. This is to ensure that the founding team remains committed to the project in the long term and cannot "rug-pull" investors.

SNS treasury (blue)

After the decentralization sale the SNS will be left with a treasury of the remaining 53% of CHAT tokens.

The bulk, 38% percent, will be used over time to automatically reward users who positively contribute and help OpenChat grow.

13% will be reserved to pay community bounties, by SNS proposal, to compensate people who contribute to OpenChat more generally. This could be used for instance to reward 3rd party developers for code contributions.

The remaining 2% will be used to provide initial liquidity pools for DEXes (decentralized exchanges). In order for CHAT tokens to be traded it is necessary to list CHAT on one or more exchanges. The intention is to trade on IC based DEXes. To list CHAT on a DEX implementing an AMM

it is necessary to provide a liquidity pool of CHAT backed by another token, in our case ICP raised from the decentralization sale. We plan to make CHAT available on several DEXes as and when they are available. For each DEX it will be necessary to create a proposal to transfer some CHAT from the SNS to the DEX, and another proposal to transfer an equal value of ICP from the SNS to the DEX. The plan is to "seed" these DEXes with the 2% of CHAT tokens set aside for this purpose although this might not all happen at once.

Initial SNS configuration

The SNS will initially be configured with the values shown in the tables below which can all subsequently be changed by proposal.

Transaction fee in CHAT tokens that must be paid for ledger transfers

0.01

Number of CHAT tokens that a rejected proposal costs the proposer

100

Minimum number of CHAT tokens that can be staked in a neuron

100

Maximum voting period for a proposal

4 days

Proportion of voting power needed for a proposal to be accepted

3%

Minimum neuron dissolve delay to vote

1 month

Maximum neuron dissolve delay

1 year

Maximum dissolve delay bonus

2x

Maximum age for age bonus

6 months

Maximum age bonus

1.25x

Percentage of total supply that will be generated annually for rewards

5%

SNS decentralization sale configuration

The decentralization sale will be configured with the values shown below.

The total number of CHAT tokens to be sold

200,000,000 (20%)

The maximum ICP to be raised

1,000,000

The minimum ICP to be raised (otherwise sale fails and ICP returned)

100,000

Duration of sale (unless maximum ICP raised sooner)

2 weeks

Minimum number of buyers

100

Minimum ICP per buyer

1

The reason to impose a maximum target is to give investors a minimum bound on the number of CHAT tokens they will receive for their ICP investment. The lower bound of 0.1M ICP and the upper bound of 1M ICP for 20% of the tokens gives the OpenChat DAO an initial total valuation between 0.5M ICP and 5M ICP.

6) OpenChat SNS treasury

The SNS will hold a treasury of ICP tokens and CHAT tokens.

Immediately after the decentralization sale the SNS will have an ICP ledger account with the ICP raised in the sale and a CHAT ledger account with 530M tokens. The plan for these CHAT tokens is described above but the treasury is available to be used by the DAO through proposals as it sees fit.

Soon after the decentralization sale, as and when DEXes are available, proposals will be made to transfer CHAT from the 20M reserve into a handful of AMM liquidity pools alongside proposals to transfer the corresponding value of ICP from the treasury to the AMM liquidity pools. This will enable the trading of CHAT.

We plan to create a proposal to stake a large portion of ICP, say 80%, as an 8 year neuron. This neuron would participate in NNS voting by following an OpenChat beacon neuron which would seek to influence the ICs agenda to suit the long term interests of the OpenChat DAO. It would also earn voting rewards for the DAO which could be used to cover ongoing costs or build up a reserve. This all depends on whether a small but significant change is made to the IC to allow canisters to control neurons.

Any liquid ICP in the reserve could be used directly, or the DAO could swap CHAT from the CHAT reserve for ICP at a DEX, and use it to fund expenses such as cycles for hosting , 3rd party services, and potentially later for paying the development team .

ICP for cycles to fund hosting

Initially, proposals will be created to transfer ICP as needed to the account of a designated developer who will use it to buy cycles and top-up the root OpenChat canister. Going forwards, the root OpenChat canister can be programmed to automatically create a proposal when it is below a threshold of cycles to transfer ICP to itself and burn it for cycles to run the dapp.

3rd party services

The intention is for OpenChat to have no off-chain dependencies so that it is not necessary to trust any human agent, for example to transact in FIAT currencies. At the moment we have the following off-chain dependencies:

- Phone number verification (which we use as evidence of unique humanity and reward verified users with some premium features). At the time of writing this is implemented using a small executable on AWS which polls an OpenChat canister and sends queued text messages, each containing a verification code, using an AWS service. We plan to integrate with NFID (from Identity Labs) and use their service to verify user phone numbers. We can then use an SNS proposal to send ICP to Identity Labs on an ongoing basis as payment.
- Sending push notifications to browsers (and later native devices). In a similar vein we use an executable on AWS to query an OpenChat canister and push any queued notifications. This will be replaced by an upcoming capability to make fire and forget HTTP calls directly from IC canisters
- Serving the dapp on oc.app (hosted on AWS). Eventually this capability will be built into the boundary nodes - see here

Pay the development team

Initially at least DFINITY will continue to fund the OpenChat development team and thus a core contributor to the OpenChat open source project. DFINITY is expecting to migrate its day to day business from existing web2 chat solutions (i.e. Slack) to using IC based web3 solutions for its needs, and by funding the OpenChat open source project is able to influence the roadmap of the project to help ensure the enterprise features it requires are prioritized. This does not mean that DFINITY is the only contributor, and OpenChat welcomes community contributions.

At some point it is likely this funding will stop and the OpenChat DAO will need to fund its own development. In this case the development team(s) can make proposals to the SNS to receive ICP for ongoing funding. For example the team could make a proposal

each quarter with a development plan and a request for funds.

7) Tokenomics

Total supply levers

At genesis the total supply of CHAT tokens will be 1B. The supply will increase if more tokens are minted and decrease if tokens are burned.

The SNS is configured to generate 5% of the total supply annually to pay voting rewards to participating neurons. This value of 5% could be subsequently changed by proposal. Voting rewards accumulate in participating neurons as maturity

. At the point a neuron's maturity is disbursed it is burned and the corresponding value of CHAT tokens will be minted by the SNS ledger to an account. It is also possible for the SNS to mint tokens by proposal although it is unlikely the OpenChat DAO will elect to do this.
The only way the SNS can burn tokens is by proposal.

Income and outgoings

At genesis the SNS will have a treasury of ICP from the decentralization sale and 530M CHAT tokens.

The SNS will receive an income in CHAT tokens from premium features, transaction fees, 3rd party integrations etc. The SNS will also receive an income in ICP from the NNS voting rewards of its large ICP neuron if that goes ahead.

The SNS will have various outgoings. It will use ICP to pay the OpenChat dapp hosting costs (cycles), 3rd parties for services, and potentially in the future, the core dev team. It will use CHAT to pay user rewards and community bounties.

In the early years, outgoings will outstrip income and the treasury will largely be used to fund user rewards and community bounties. The expectation is that as income grows over time it will eventually balance outgoings. A higher income would also allow a higher rate of user rewards and bounties to encourage higher growth in users and usage.

As the OpenChat DAO sees fit it can choose to burn CHAT tokens to reduce the total supply. The expectation is that over several years the SNS will be able to afford to burn CHAT at an increasing rate until the burn rate matches the minting rate from voting rewards and the total supply becomes constant.

The following diagram depicts a projection of the total supply of CHAT over time. For the purposes of this projection it is assumed that the reward rate will remain at a constant 5% and that the burn rate will start at 0.125%, increasing by a factor of 1.5 each year, until it balances the reward rate.

Token price

There are various factors that will influence the price of CHAT tokens such as

- Total supply
- Market sentiment
- Income
- Costs
- Liquid supply

We have discussed total supply but arguably liquid supply is a bigger factor when considering the token price.

After the decentralization sale, participants will receive a basket of neurons of varying dissolve delays with only 1/13 being immediately liquid. The voting reward rate, initialized to 5%, is expected to encourage token holders to lock up a certain proportion of tokens thus, at least temporarily, removing them from the liquid supply. In the case of the seed funders, every neuron has a 1 year vesting period before it can even start dissolving. In the case of the founding dev team, every neuron has a 3 year vesting period.

There are various tokenomics parameters which can affect the proportion of CHAT that is locked up. These include the max dissolve delay, the dissolve delay bonus, min dissolve delay to vote, max age, max age bonus, and voting reward rate. We have carefully chosen initial values for these parameters which we believe provide a good balance of incentives but these are all levers available to the DAO to allow it to influence the total and liquid supply and therefore the price if so desired.

Consider the SNS treasury of CHAT tokens. These tokens are liquid but are only being trickled out (in percentage terms) to the community as user rewards and bounties, and then only some proportion will find their way onto the market (DEXes). It is a similar story for the portion of CHAT held in the NNS reserve - it is liquid but will not enter the market unless the DAO decides to conduct a future sale.

As a general rule the DAO will want the price of the token to rise over time but this has to be balanced against other factors such as the growth of the app. For instance it might be desirable in some circumstances to turn the user reward taps up higher to encourage more user growth but in the short term that could negatively impact price by increasing the liquid supply.

Voting power over time

The following diagram depicts a projection of the voting power over time segmented by founding dev team & seed funders and the rest of the token holder community. This projection is derived on the basis of the initial SNS parameter values, the initial token distribution, intrinsic properties of founder/funder neurons and some assumptions:

- The SNS will distribute 20% of its treasury annually
- The dev team and seed funders will keep 92% of their neurons staked for the period
- Other CHAT holders will stake 50% of their neurons going forwards
- The average dissolve delay for a neuron will be 6.5 months
- 20% CHAT sold in decentralization sale and remaining 9% allocated for sale remains unsold. The
- founding dev team and seed funders have their voting power reduced as a proportion of CHAT sold out of total allocation for sale = 20/29 = 69%

The full model used to plot this graph can be found in this spreadsheet

.

In the first year the share of voting power held by the community is expected to decrease as it is assumed they will only stake 50% of their tokens going forwards whereas the founding dev team and seed funders expect to keep 92% staked. However, thereafter it is expected that voting power will shift further and further towards the community as more tokens are distributed. Importantly the balance of voting power should always remain in the hands of the wider community.