A novel decentralized governance and verification protocol for trustless job trade.

Nomad Labs

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Abstract

Modern work life is filled with third-parties (recruiters, platforms, and consulting firms) that connect companies (producers of goods and services) with the talent they need to realize the potential of their business. It's a golden era for these middlemen - their global market was 900 billion dollar in 2021 just for software developers - and almost every penny is the price of trust. [1, 2, 3, 4].

What if technology could provide the trust and thus remove the need for third-parties in job trade? Blockchain can. The emergence of Decentralized Autonomous Organizations (DAOs) built on blockchain offers society a cost-efficient allocation of competence - if recruitment and governance is done right.

DAOs are member-owned communities without centralized leadership - based on the fundamental idea of trustless governance in arbitrarily large networks. Projects like Uniswap, Maker, and Compound have proven the utility of a DAO by creating cost-efficient, agile and innovative organizations based solely on member contributions.

Nomad is a DAO for freelancers that removes the need for trust, thus removing information barriers and agent problems within the network. This is achieved through a novel, fully decentralized governance model that incentivizes members to strengthen the network and incorporates recruitment in the protocol - A transparent network that offers companies minimum cost labor and members full autonomy, fair ownership, access to funding, and the benefits of consulting firms - without third-parties involved.

Is Nomad the first freelance DAO? No, there are some out there. But they're either focusing on niches (blockchain developers, designers, etc.) - like LabourX, or they're third-parties in disguise - like Braintrust - and none are incorporating recruitment in the general governance process.

Strengthening freelancers through blockchain technology will benefit society through cost reduction, increased innovation, and more efficient allocation of competence. Everyone wins - except the expensive middlemen currently holding our economy hostage.

1 About Modern Job Trade

Third parties exist in job trade mainly because of the trust barrier between an employer and a candidate for a vacant position - can we trust them to have the proper skill set to fill the role to our needs? The average cost of recruiting an employee is 40% of a one-year salary, incentivizing companies to outsource both the hiring process and the work. The absolute minimum cost in the current market is 10% for sourcing and filtering candidates - a service mostly delivered by digital marketplaces like TopTal, Upwork, Braintrust etc. If you add staffing to the mix, the price resembles that of a hiring process, ranging from 20-50%. Sprinkle some flexibility requirements and network effects, and we have the consulting houses at 50-80% fees.

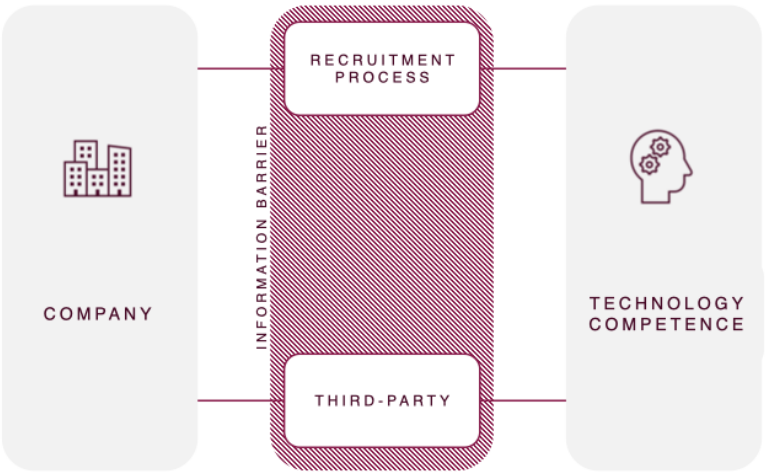

Figure 1: There is asymmetric information in the job trade - and third parties such as consulting firms aids in solving this problem.

For clients, Nomad provides skill verification, access to an expert network, and a large capacity of resources at a minimal cost. For members, Nomad offers tech talent autonomy, fair ownership, and the same benefits as consulting firms offer.

No hidden markups. Available competence. Higher salaries. More autonomy. More collaboration. Fair ownership. More efficient allocation of competence.

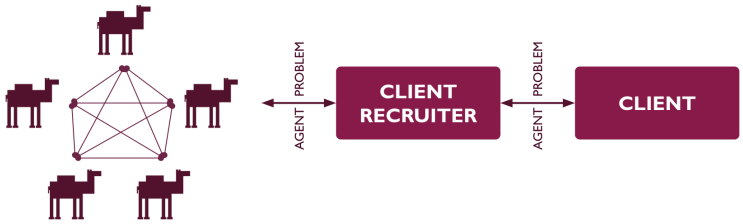

Figure 2: Nomad removes the need for third parties by aligning incentives in the value chain.

2 Introducing Nomad

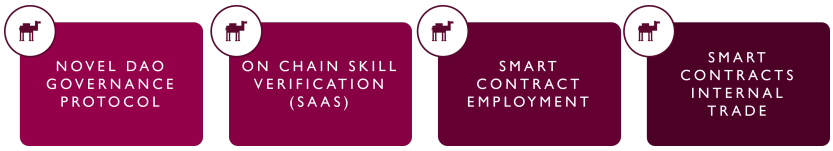

Figure 3: The four innovations of Nomad.

Nomad makes four core innovations: a novel DAO governance protocol for independent workers, on-chain skill verification, a smart contract for employment, and smart contracts for internal trade.

Nomad consists of the members, a governance protocol, member-available products, a treasury, smart contracts for employment and internal trade, and dApps for clients to interact with the network. The members are independent workers that through their ownership govern the network, manage the treasury, and collaborate through internal trade. The governance protocol dictates how the network is governed. Member-available products can only be accessed by members. Some will also be sold as SaaS products, for instance the on-chain skill verification. The treasury holds the network's equity and can be accessed through the governance protocol. The smart contractfor employment is used for client engagements. The smart contracts for internal trade facilitate collaboration.

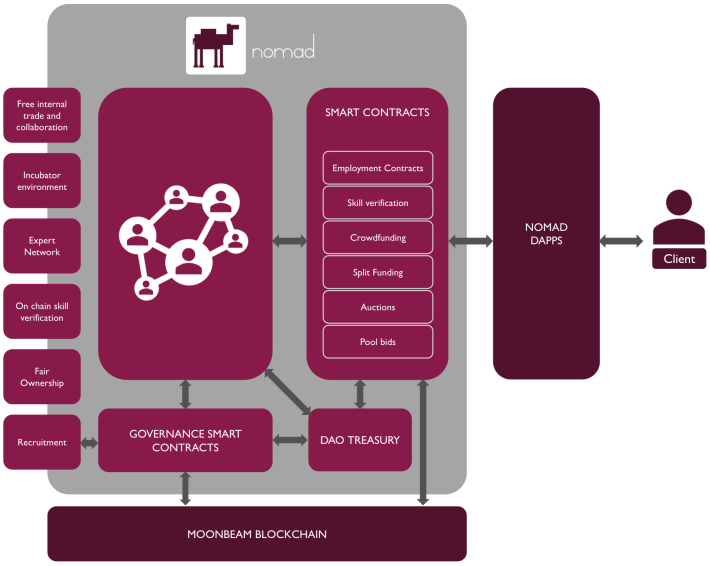

Figure 4: Nomad Architecture

2.1 Nomad DAO

Nomad is the DAO with a governance protocol that enables the decentralized tech talent network. A DAO governance model is an economic game incentivizing members to contribute to the network. The requirements of the Nomad governance model is to

- Incentivize independent workers to join the network
- Ensure that the skills of members are verifiable
- Remove barriers for internal trade and information between independent workers
- Ensure secure transactions both externally and internally

There are two main incentives for Nomad members to contribute to the network - Through fair ownership, they partake in the growth of the network. Through governance, they gain power in and secure the network.

2.1.1 The incentive of ownership

Through the member's ownership in the network, the member is incentivized to increase the value of the network. The value of tech talent networks increases with the strength of its members, the offered products and services, and the size of the treasury.

Minimum-cost recruitment is enabled by incorporating the recruitment process in the governance model. Active members propose and vote to enlist new members. If accepted, the candidate is whitelisted as an active member. Active members have exclusive access to products and services such as, internal trade with the expert network, funding, incubation, and participation in the governance model. An active member must complete engagements through Nomad's parameterized smart contract to maintain his membership.

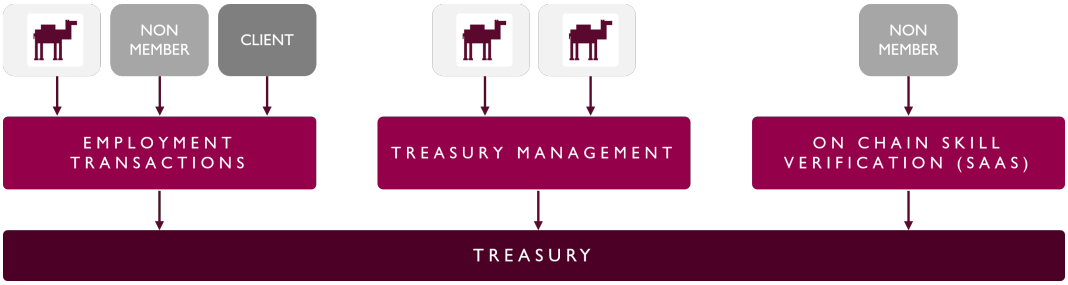

Figure 5: Cash flow structure - Nomad generates income from transaction fees, SaaS fees, and return on committed capital.

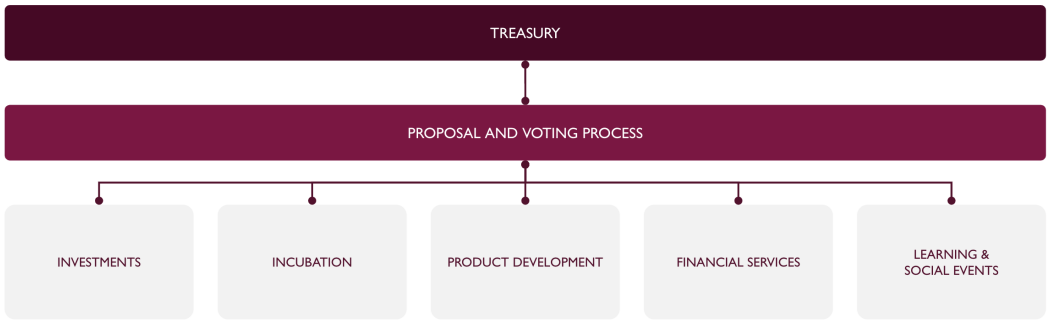

Figure 6: Nomad members govern the treasury and manage capital in a completely decentralized manner.

The equity of the network is stored in a treasury and can be accessed through the governance protocol. Members are incentivized to use Nomad's contracts to increase the value of the network they own, to gain governance tokens and to maintain their active membership. The size of the treasury will also increase through commercialization of any product the network develops and return on the network's in-house investments through incubation.

2.1.2 The incentive of gaining power

A member can increase his share of governance tokens in two ways: 1) Staking after completing activities that transfers money to the treasury. 2) Delegation. Staking means to make your tokens available for the protocol. Delegation means to delegate your vote to an active member, including yourself.

2.2 On-chain skill verification

Nomad's on-chain skill verification stores CVs on the blockchain. The information will identify the employer, the employee, an project description, the employee's role in the engagement, the deliverables and the quality of the deliverables. The information must be approved by the verified addresses of the employer and the employee to be deployed on-chain.

2.3 Employment Smart Contract

Nomad's employment smart contract represents a peer-to-peer work relationship between an employer and an employee. It will hold all funds for the duration of the contract and work as a secure way of payment for both the employer and the employee. A network-decided percentage of the contract's value will be transferred to Nomad's treasury every time the contract makes a payment to the employee.

The smart contract can also be used internally between Nomads. This will facilitate collaborations such as cross-functional teams, subject matter expert input, and replacing members unable to complete an engagement.

The smart contract for employment can represent any employer-employee relation and will be available for anyone to use, also non-members of Nomad. For instance, non-tech freelancers may choose to use the contract to ensure secure payments.

2.4 Smart Contracts for internal trade

Nomad's smart contracts for internal trade enable collaboration within the expert network. A member contract stores addresses on-chain and represents all working members of Nomad, a crowdfund contract enables internal funding, and a treasury contract regulates access to the network's equity.

3 Implementation & Architecture

This section outlines the governance protocol and its smart contracts, including the tokens, governance, and utility contracts.

3.1 Governance Protocol

Nomad's governance protocol is an improvement of the Compound governance protocol [5]. Compound is decentralized network with a well test governance protocol that provides financial applications.

A challenge in decentralized governance is impasse and insecurity due to low voting participation - the Compound governance model introduces vote delegation to enable semi-passive participation. However, there are no proper mechanisms in this model to ensure security in the case of low participation. Nomad's governance protocol increases security by extending Compound's protocol with Polkadot´s Adaptive Super-Majority algorithm that ensures statistically significant majority [6] even in the case of low participation. To ensure proportional representation in multi-winner ballots, Nomad incorporates the Sequential Phragmèn Voting method [7].
Here, we propose a novel approach to this problem - with a special emphasis on restricted-access DAOs where one has to consider recruitment.

3.1.1 Governance Requirements

1. The expected utility of joining the network for the target member must be no less than the alternative:

   $U_x(DAO|Game) \geq U_x(\neg DAO|Game) : \forall x$

2. Governance power cannot exceed commitment ("Skin in the Game"):

   $E[U_x(power|Game) + U_x(Internal|Game)] \ \alpha \ R_x(y|Game) : \forall(x, y)$

3. Recruitment has to be incorporated in an equivalent economic game as all other governance aspects:

   $Game(Recruitment) \equiv Game(DAO/Recruitment)$

4. The expected utility of contributing to the network is higher than attacking it:

   $E[U_x(y|G)] \geq Cash(DAO)_t : \forall(x, y, t)$

3.1.2 Model

Now that we have defined the criteria mathematically, we explain our model in words and prove why the stated equations hold under this model.

i All inflation is cash backed by committed capital at the free market price of cash flow rights.

ii We have to types of tokens - one representing governance and access to internal services, and one representing cash flow rights.

iii There is a one-to-one relationship in issued governance tokens and tokens representing cash flow rights.

iv Governance tokens are non-transferable

v Governance Tokens must be burned to be able to sell cash flow tokens in the open market

vi Recruitment is governed by the same same economic game as all other governance processes.

So, how does this effectively govern a restricted network in an efficient manner?

- By i, all inflation is backed by cash $\implies$ All tokens are backed by capital at the open market price at the time of issuance $\implies$ All contributors always capture their fair share of inflation.
- By $ii - v$, 2 Holds because you can never own more governance rights than cash flow rights by definition, where there is a one-to-one relationship between cash flow rights and risk in issuance.
- By iv, 3 holds by definition. Morever, every participant has incentive to only select candidates contributing to positive network effects, thus implying that the incentive of joining the organization is always at least as large as the alternative except for the mandatory cash commitment. So the only requirement for ensuring 1 holds is that the value of voting power, access to the internal services and expected return on investments are higher than a risk-equivalent investment - a requirement always present in any investment (if you solved this problem with a model, that model is an infinite money machine $\implies$ it is impossible).
- Now, given our stated requirements, the only thing left to prove is 4 -i.e. that everyone is more incentivized to contribute than to attack the network. Now, assume some member m has an incentive to attack, that is, that (4) does not hold. Then m must have a larger risk-adjusted payoff from attacking than the expected cash flow given that m does not decide to attack the network. Now, by attacking and succeeding, you receive a maximum payoff of $cash(DAO)_t$ since the network is worthless in that case, so we have

  $cash(DAO)_t \geq E[U_m(DAO|G)] + cost(attack)$

- Now, to attack the network, m needs to control a supermajority ($>> 50\%$) of the governance token, which cannot be obtained by anything else than committing capital to the network - meaning that m needs to own $> 50\%$ of $cash(DAO_t)$ to be successful, so

  $cost(attack) > (1/2)cash(DAO)_t$

- Thus, we have:

  $cash(DAO)_t \geq E[U_m(DAO|Game)] + cost(attack) > E[U_m(DAO|Game) + (1/2)cash(DAO)_t \equiv (1/2)cash(DAO)_t > E[U_m(DAO|Game)$

  Now, note that $E[U_m(DAO|Game)] > E[U_m((1/2)cash(DAO)_t)]$, so we are left with the claim

  $(1/2)cash(DAO)_t > E[U_m((1/2)cash(DAO)_t)]$

  implying that the expected payoff from the commited cash flow in the network is negative - but then m would never have an incentive to commit capital in the first place, so it must be that the network is secure if people are willing to commit capital in the first place (meaning that the DAO is non-existing) ad absurdum.

Thus, by implementing this decentralized governance model, one only has to consider the value of the governance rights and the access to internal services/market - why not also design this part as well? In short, we have proposed a governance model for restricted-access DAOs in which we impose no binary rules internally and incorporate recruitment in the same economic game as that of the DAO in general - effectively creating a frictionless decentralized governance model also imposing trust between its members and the outside world (because the outside world knows that recruitment is done with proper skin in the game).

3.2 Recruitment

An important aspect of Nomad's governance model is that recruitment is incorporated in the protocol to remove agent problems from the process. A proposal for a new candidate must come from an existing member of the network, and every nomad have voting rights in the recruitment decision proportional to their ownership in Nomad DAO. An accepted candidate is whitelisted as an active member of the DAO.

3.3 Smart Contracts

3.3.1 Employment contract

The employment contract will consist of multiple contracts working together to provide the necessary functionality to create a secure on-chain work relationship. Among the functionality are the ability to fund the contract and claim funds from the contract. It will hold all funds for the duration of the contract and work as a secure way of payment for both parties. This security is provided through a transparent funding paradigm that ensures the employee payment for certain intervals, and enables the employer to stop funding if the work is inadequate. Through its parameterized development approach, the contract can be fine tuned to the user's needs. Being able to choose the rate of pay, the payment intervals, start and end dates, customer address, and so forth, will give users the ability to adapt to every customer and every work relationship.

3.3.2 Membership Contract

The member contract will store a list of addresses that represents all the active members of the DAO. Existing members propose new members and if the candidate is accepted through voting, the recruit method in the contract will run and store their address in the list.

Anyone can buy the CML token on the open market. This token will only represent the cash flow of the network. Only active members will be able to earn gCML and use it to govern the DAO. This is a strategic choice to ensure appropriate governance of the network.

3.3.3 Skill contract

The skill contract will store work experience on-chain and provide methods for verifying said experience. It will hold a mapping from address to a set of work experiences. Each work experience can be signed by an address to provide on-chain skill verification for a member.

3.3.4 Crowdfund contract

The crowdfund contract is available for active members to crowdfund projects within the network. This will consist of multiple contracts working together to ensure a secure and seamless crowdfunding experience. It will also be possible to utilize this in combination with the split contract to create a fair allocation of ownership if need be.
The parameters will consist of an operator, funding recipient, funding cap, token information and other necessary variables. An operator has the role of changing the contract status. The funding recipient will receive the invested funds. The funding cap is a ceiling for the amount of funds that can be raised. The token information stores information about the token that is minted when a contribution is made.

3.3.5 Split contract

The split contract creates an allocation across a number of different addresses. The contract facilitates team work by providing the ability to share an employment contract. This way all the funds from the employment contract will be sent to the split contract, and the members of the split will be able to claim their respective allocation. It also facilitates allocation and correct payment for crowdfunding and possibly other investments done by the network.

3.3.6 Treasury contract

The treasury contract is a simple vault implementation holding all the funds collected by the protocol. The treasury will be governed by the community and used to fund new ideas, saving, investments, and if agreed upon, dividends.

3.3.7 CML token

The camel (CML) token is an ERC-20 token that you can trade on the open market. It represents cash flow in the network.

3.3.8 gCML token

The governance camel (gCML) token is an ERC-20 token that is primarily used to govern the network. It allows the owner to delegate voting rights to any address, including their own address. Changes to the owner's token balance automatically adjust the voting rights of the delegate. It will also be mintable by the protocol. Every new token that is minted is backed by stablecoins stemming from all the funds collected by the protocol. The tokens can be burned and exchanged for CML tokens at a 1:1 rate, which in turn can be sold on the open market. However, you are not able to buy back any of your gCML tokens. They have to be earned through cash flow to the treasury, f.ex. through the commitment fee in the Employment contract. This creates an incentive to hold gCML over CML.

4 Road Map and Potential products

Potential products and services developed by Nomad Members.

4.1 Nomad Marketplace

The fact that Nomad is platform agnostic does not mean that the network will never have its own marketplace. 25 percent of freelancing runs through freelance platforms, and Nomad members might find this sales channel attractive enough to create their own marketplace.

4.2 Smart Team Matching

Nomad may choose to develop a matching mechanism to help active members form cross-functional teams to complete complex client projects. The network structure of a DAO already facilitates a Machine Learning based matching process.

4.3 Incubation

Nomad has the potential to become a highly efficient incubator facilitated by the network's smart contracts .Through their talented members, the network can generate ideas. Through the crowdfunding contract, the ideas can be supported financially. Through the employment contract and expert network, the startup can access the required competence to grow.

4.4 DAO on DAO

Nomad members belonging to different subgroups can choose to build a DAO on top of the Nomad DAO. These may be grouping of certain expertise, certain locations or even the before-mentioned teams focusing on certain client projects. Their DAO can have governance rules tailored to the group's needs.

4.5 Payments and liquidity solutions

Nomad can provide liquidity to active members through the treasury. If an active member holds a contract that pays a single figure after project completion, he can sell it to Nomad in exchange for monthly payments. The premium the network will charge for such a contract will be decided by the active members of the network.

4.6 Home Office Co-Sharing

The members of Nomad may find value in co-sharing their home office. An active member visiting a foreign city for project purposes may rent housing with home office facilities through the network. Through its members, Nomad will have world wide access to offices.

4.7 Business Support

A freelancer must manage his own books and ensure that taxes and other fees are paid to the government. The members of Nomad, having a lot of experience with such processes, may develop their own business support, tailored to the identified needs of the network.

4.8 Headhunting

For a one time fee, a company may request that the network proposes a candidate fit to an open job offering at the company.

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