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Harbour

Decentralized governance powered by Ethereum and IPFS

Harbour is a protocol designed to simplify governance through modularized infrastructure that defines foundational rules tailored to specific types of organizations. The protocol, along with the Harbour platform, allows effective organization for all things revolving around voting. Extensions of dispute resolutions are additionally planned.

Dean Eigenmann, Dylan Dewdney, Klajdi Ciraku, Samuel Furter, Selim Imoberdorf

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“Although our modern communications technology is drastically augmenting individuals’ naturally limited ability to both interact and gather and process information, the governance processes we have today are still dependent on what may now be seen as centralized crutches and arbitrary distinctions such as “member”, “employee”, “customer” and “investor” – features that were arguably originally necessary because of the inherent difficulties of managing large numbers of people up to this point, but perhaps no longer. Now, it may be possible to create systems that are more fluid and generalized that take advantage of the full power law curve of people’s ability and desire to contribute.”

- Vitalik Buterin, August 21, 2014

Abstract

One of the primary problems that the blockchain claims to have solved is one of rules. In blockchain, code is law, as they say. Once the terms of a smart contract have been set, they are unchangeable. This is a defining and powerful feature of blockchain, but it puts tremendous pressure on organizations to build a perfect system in a changing world rather than iterate them out dynamically.

The unchangeability of code and thus the immutability of its rules also opens up a major problem of blockchain technology, which is once the rules have been set, who dictates them or enforces them? If we cannot have a dynamic way to enforce rules and change systems in a changing world and on human terms, then the blockchain is only half-formed and reaches only half its potential[1]; if we are to have a productive symbiosis as humans with blockchain technologies, these problem will need to be addressed, and we hope that Harbour Protocol addresses them not only adequately but completely.

Therefore, the Harbour Protocol describes a set of tools to facilitate the creation and usage of governance structures. Through the protocol, complexities of legacy governance systems can be simplified and implemented on the blockchain. The protocol also incentivizes third party developers to build functional extensions for the base protocol.

The protocolization of governance structures allows developers and organizations to focus on the important aspects of their development. This is achievable because the heavy lifting and implementation of governance is solved through Harbour. In addition, protocolization will lead to more rapid development and deployment of a variety of governance applications in the real world.

Interaction with our protocol and its products happens via a very well-designed and intuitive UI. We plan this UI as a nexus where, ultimately, millions of people will exercise their will. Harbour will be the arbiter and vessel of a new, more efficient way of human self-organization.

[1] Yarvin, C. The DAO as a Lesson in Decentralized Governance. 2016.6.24 https://urbit.org/blog/dao/

Introduction

Harbour is composed of three major synergistic and interoperating structures: the protocol itself, the platform, and the package manager. The protocol encompasses the necessary building blocks and toolset to build and design decision-making structures on Ethereum. These distinct decision-making structures, which end up forming modules, or packages, are deployed on the Ethereum blockchain and registered within the package manager, where organizations can choose and utilize their preferred decision-making package within the platform. The Harbour platform is both user and administrator-centric, and is the core for all decision execution.

Harbour Ecosystem

The three major interoperating structures of Harbour as per above come to form a harmonious cycle ecosystem. The protocol is used by devs to build, then refined by devs through HIPs, and these HIPs are based on feedback from users and organizations in the wild; the platform, through its various integrations into existing DApps is dynamic with the best and widest possible methods of delivering its functionality, voting and decision-making; voting and decision making itself, when done en masse and in a fundamentally more convenient and verifiable way, then informs new democratic and organizational forms that can be built and further refined by devs.

Organizations

Organizations can range from governments, to businesses, to municipalities, to charitable organizations, and then to associations of various kinds. The secure, transparent, and significantly more efficient system allows for obvious benefits including 100% verifiability [2], reduced labour and material cost, higher trust levels of the constituency, and more efficient, cogent, and dynamic decision-making.

Voters

Voters are individuals exercising will as a citizen of a state, an employee of a company, a shareholder, or a delegated authority. Voters exercising their will in Harbour, either through their vote or through the delegation of their vote, interact with an easy-to-use system and UI that prompts and supports their decision-making. This sea-change in voting system and interface convenience, verifiability, and efficiency we believe will naturally coalesce with higher participation and engagement from constituent voters, leading to overall better decision-making.

[2] http://ledger.pitt.edu/ojs/index.php/ledger/article/view/62/51

Proposers

Proposals are the natural pretext for any decision. Proposers, and those who have the ability to propose, have a key role to play in shaping how the organization reacts dynamically to its environment or to the needs of its constituents. Proposers exercise will by helping to set the agenda and their proposals will be conveniently presented to voters. If proposals are simply presented to the voters and they are prompted in an efficient way, then democratic forms can react more dynamically, quickly, and effectively.

Harbour Protocol

The Harbour Protocol provides organizations with an efficient set of tools for creating a concrete set of governance structures. By providing users with an array of modules--types of governance models created by developers on our open platform--organizations of any size are enabled to control how they are governed.

Putting governance on the blockchain, through an open standard is beneficial in a variety of ways. Having a collaborative and open protocol ensures a lower risk profile and tightened security of the code as open standards develop over time.

Along with more simple governance, the Harbour Protocol makes flexibility and modularity of an organization easier. Organizations can choose to update various components, something challenging to do on the blockchain.

Organizations

All governance structures deployed via the Harbour protocol are known as organizations. The goal of an organization is to model a decision-making structure. Within Harbour, this is done through the combination of different packages that abstract various aspects of a decision-making into simple smart contracts. This gives owners the flexibility to fully customize their organization. Currently the modules that are used to bootstrap an organization are as follows:

- Democratic Form[3]
- Decision Mechanism
- Electoral System
- Voting Rights
- Voting Power

[3] Not yet implemented

The modules range from simple configuration modules, to those that can implement a complex amount of logic, for example in a large organization.

We aim to allow multi-layered governance structures utilizing various democratic forms, and these forms themselves could have multi-layered and overlapping systems of voting rights and power.

By supporting third party developers, an ecosystem develops that is a standard for governance structures on the blockchain. Decentralized organizations will grow immensely more complex as they mature into fully grown products, further, they will inevitably require the agility that a bespoke governance system can provide..

Democratic Form

Harbour currently focuses on building various forms of democracies. Other governance structures may later be investigated. The democratic forms should be easy to implement so third-party developers can create modules that the Harbour team has not yet developed.

Harbour plans on initially launching with direct and liquid democracy. However this will be expanded to other forms, some of which are described below.

Direct Democracy

One of the great benefits of direct democracy is that it maximizes political self-determination. The people vote directly on issues and legislation. There are two main types of this form: participatory and deliberative.

Semi-Direct Democracies

In these models, representatives run the day-to-day operations of governance, yet citizens ultimately remain sovereign through referendum and initiative.

Representative Democracies

The most common form of democracy. Constituents do not vote directly, but instead put their vote into people for whom they think will carry out their will.

Liquid Democracy

Liquid democracy confers the benefits of both direct democracy and representative democracy into one model, conferring full decisional control, where voters can vote directly or delegate authority as they choose.

Decision Mechanism

Along with the various forms of democracies that can be implemented, a wide array of decision mechanisms to select is also of large importance. They determine how a user can vote on specific issues.

Single Choice

One of the most popular decision mechanism is the single choice rule, this defines that a voter is allowed to elect a single choice that they are in support of.

Multichoice

Multichoice is a popular decision mechanism in democratic forms however it is not usually used as often as others.

Ranged Choice

Ranged choice allows voters to associate a set of values to their choice, for example the ‘top’ option down to the lowest.

Cardinal Choice

Cardinal choice gives candidates and/or proposals a rating or a grade based on two levels of approval: “approved” or “not approved”, in simplest form.

Electoral System

Organizations require different electoral systems. These are used to determine which candidate is the winner from a vote. Sometimes there are simple proposals where an absolute majority determines the winner, but this can have a huge range. To support the variation, the protocol will allow for the selection of an electoral system. The comprehensive platform will require a level of abstraction for the evaluation process. Due to the way voting has been solved currently, the current implementation will require multiple iterations to get to a ready-state.

The desired electoral system is defined on each proposal, allowing every proposal in an organization to use a desired electoral system. However, the organization can choose to set a default system.

Plurality

Plurality voting requires a candidate to simply receive more votes than any of the other candidates. This is useful for a vote with multiple options that should not result in a second and third round to find the absolute winner, like the majority would require.

Majority

The majority requires a candidate option to receive more than 50% of the votes. In the protocols current implementation this is calculated to two digits of precision.

Unanimity

Unanimity requires 100.00% of the votes to be in favour.

Other Systems

Aside from the the simpler iterations as noted above, there are a plethora of electoral system types: first-past-the-post, Bucklin voting, Borda count, proportional approval voting, etc. We expect that all possible permutations of extant and known electoral systems can and will be modelled through the Harbour Protocol[4], further, we expect new permutations to result that we may not yet be conceptualized.

Voting Rights

Voting rights are one of the most important aspects of the protocol, representing a foundational module. The voting rights define who can participate within an organization. They additionally define if proposals require the approval of an organization member, and who can approve such proposals.

Multi-Owner rights

Multi-Owner rights, or whitelist rights, are one of the most common governance structures, due to their implementation in multisig wallets. Similarly, multi-owner rights work by giving voting and proposing rights to addresses stored in a whitelist. Additionally, the whitelist can be easily extended to add another owner. To make this work harmoniously with the Harbour protocol, an add to whitelist proposal could be created.

Token rights

Token rights are also a well known system which could be beneficial to multiple blockchain projects that have already implemented a token. The token rights would give holders of a certain token the ability vote on and create proposals. These proposals could be used to define the direction of the token, attach it to stated ICO milestones, or even configure its operations.

[4] For an exhaustive survey of these systems please refer to https://en.wikipedia.org/wiki/Electoral_system#Plurality_systems

Voting Power

The voting power is another one of the two foundational modules. It defines the minimum quorum as well as the weight a given voter has. The implementation possibilities are plentiful, and can be based on a wide range of rules defined within smart contracts. These implementations can be kept simple, but on the other hand can also be grown to large complexities, depending on what an organization requires.

Token weighted power

Token weighted power would give token holders the voting power of however many of the specified token they hold. The quorum would then be related to however many tokens were voted with, and the maximum votes would be the total supply of tokens.

Single vote per address

Single votes per address would allow each address that can vote to have the power of one vote. This would work very well for a multisig implementation where each owner is considered equal. Fraud could be prevented in this model through attaching and authenticating identity via third-party integrations.

Sybil Attacks

In public voting systems, sybil attacks are often a concern. To keep the protocol simple, secure and straightforward, the issue of sybil attacks should be addressed in Voting Power and rights implemented by the systems built on top of Harbour, however the Harbour system will implement core features to help on the mitigation of sybil attacks.

Sybil attacks are only possible if an organization uses a voting power system where identity is not accounted for, this would imply that there is no form of whitelist or a token model voting does not use a staked system. In order to make it easier to implement staking systems with regular ERC20 token structures, Harbour will release a staking system that can be easily used with any token system that has already been deployed. The goal of this staking system is to allow for not needing a cloning token system.

Proposals

Proposals occupy a fundamental and distinct role in any decision-making process as the initial impetus of change in any governance system. Within the Harbour platform, users can design their preferred model for proposal submission and who can propose, how often, and at what point a proposal is ratified.

Components

As a set of loosely integrated smart contracts, components allow proposals to perform numerous functions, and can also operate as third-party integrators, for example connecting a number of voters to the management and operations of a crypto fund[5].

Components are loosely coupled smart contracts that allow proposals to execute a wide range of functions. Components can be thought of as apps which can be added onto an organization, an example of a component as such would be a Vault, where tokens and ether can be transferred in and out of.

Vault

The Vault is one of the first components to be built by the Harbour team. Value transference is a fundamental property in the world at-large, and it is no different with Harbour. Off-the-shelf, the Harbour protocol can be applied in concert with the Vault to satisfy a variety of needs for an organization's funds.

Harbour Package Manager

The package manager can be thought of in a similar manner to the App Store. It allows for easy management and discovery of packages which can be added to organizations. Packages stored in the package manager can be automatically added to organizations using the user interface.

The package manager is inspired by NPM as well as the package manager created by Aragon[6], and fully conforms to the EIP190[7] standard. All packages require a specification file that will be saved on IPFS. This file contains various pieces of information that will be displayed to the user. One of the important pieces that differentiates the Harbour Package Manager from others is that certain packages act in different ways. Module packages for example are not redeployed, but proxied using a module proxy.

Packages stored in the package manager are each stored as a smart contract, these packages store a list of versions, the owner of the package has the ability to create a new version. This in turn allows all the dependents of the package to easily update to the newer versions. The package itself stores various information such as the IPFS hash which stores the entire package information. The version itself then stores more specific information.

[5] Please check the "Use-Cases" for a more in-depth discussion on this example and others.
[6] https://github.com/aragon/apm-contracts
[7] https://github.com/ethereum/EIPs/blob/master/EIPS/eip-190.md

Packages all receive an ENS subdomain with which they can be directly linked to, these subdomains are all under the Harbour Package Manager domain, for which we have currently decided to use **harbourpm.eth**.

Along with the subdomains for the packages, each version receives a subdomain which is comprised of the version number. This allows the module proxies which are used in the protocol to be kept rather simple.

Harbour Platform

The Platform is the main interface for organizations, users, voters, and the like. The design is intended to be intuitive, exhaustive, and simple. Harbour believes that executing decision-making and voting should be as convenient as sending a text. The Platform will be both administrator and user-centric, allowing organizations to deploy preferred methods of governance for their constituents, and for constituents to easily interface with proposal and voting functions.

Harbour API

In order for our protocol to be truly modularized, we have determined the need for an open source library to allow developers an easy method of creating their own tools built on top of Harbour. This means that we should facilitate others to build custom frontends for their organizations. We believe that the easiest way to allow for this is to build a Javascript library that has fully decoupled frontend implementations.

Third Party Integrations

In order for Harbour to be accessible by a wide spectrum of users, the development team has recognized that the supporting multiple platforms is of paramount. For this reason, integrating into existing platforms and apps will be one of the targets which the team plans to achieve.

Aragon

With the new system developed by Aragon, many of the features implemented by Harbour can easily be used by organizations running on Aragon. To allow for this to happen, an application will be developed that allows the porting of various Harbour functions to allow for usage within Aragon.

Additionally, we will also think it's important that a Harbour organization can execute functions within Aragon, for example what should be done when a proposal passes. For this reason extensive executors will be built that allow this.

Status

The ability to vote easily and freely is as important as voting itself. Status, as a multi platform DApp browser and messenger with large potential for wide use, is a great candidate for integration with Harbour. The integration itself is a simple interface augmented with chatbots that prompt and enable both proposing and voting that is as easy as having a text conversation with a friend.

Toshi

In keeping with our ultimate commitment to extend access to voting and decision-making wherever and however possible, we will also integrate with Toshi. Toshi is a mobile based DApp browser similar to Status.

Case Examples

There are a number of use-cases that have already been fully conceptualized, ranging from echoing traditional corporate shareholder structures to crypto-fund governance by token holders to state elections.

While the basic operations and functions of a state election are logically and mathematically simple, they are nevertheless logistically and socially difficult. The ‘analog’ method of vote casting used for example in the US presidential election is subject to political will(s) based on geography, ie gerrymandering and the like, as well as the standard apathy that comes with the inconvenience of leaving work, etc. In addition, it is expensive and grossly inefficient[8]. For example, the 2000 US presidential election is estimated to have cost $1B+ across all of America’s counties and municipalities, and it is estimated that $544M was lost in productivity for the 2012 election, simply by waiting in line to vote. The Harbour Platform would provide a way for citizen to securely, cheaply, efficiently and verifiably cast a vote at the municipal, state, and federal levels. It would also help solve for voter apathy and make access to voting and constituent representation more equitable.

The operations of a decentralized crypto-fund is also a great use case. Token holders of such a fund could have voting rights over its composition, and/or they could delegate votes to authorities, oracles and/or experts of the fund, depending on the structure of the fund.

And yet another use case would be the governance of an organization under the general framework of a traditional shareholder model. However, if that organization used Harbour, it would no longer need to wastefully prepare documents or convene meetings, and proposals would be scrutable and presented in very understandable terms. In addition to saving time,

[8] http://time.com/money/4556642/election-day-2016-costs-country-voters/

productivity, and resources, this would also make such an organization way more dynamic than its traditional counterparts. Decisions requiring shareholder votes could be made wherever and whenever possible, unbeholden by time nor space.

The Harbour team also envisions that new, more efficient forms of governance and decision-making will develop organically that will have use-case relevance that we may not yet understand or are not yet conceptualized.

Governance

Similar to Ethereum EIPs, Harbour Improvement Proposals (HIPs) are a way to drive innovation and standard development for the Harbour Project. Members of the Harbour community will have the ability to signal what features and changes they believe are important and should be implemented by using their tokens as a voting utility. The goal of the governance is to provide the community with methods to be an important part of the further development of Harbour. Gradually the things that can be voted on will increase over time, allowing for a fully inclusive governance model.

Transparency Policy

Harbour commits to 100% full transparency on its general operations. Moreover, Harbour itself will be governed and built using its own tools, and our governance structure and decision-making will be completely transparent to our contributors. The disclosure of the use of all funds will be open and public as well as the progress of the project through regular updates via medium posting and the like. Development updates will occur at regular intervals, likely bi-weekly. All new team members will be announced as well as third-party integrators and contractors.

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