Tables

Decentralized heterarchical work economy on the Tangle and P2P networks

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WORKING DRAFT

Abstract

Tables is a hybrid of Tangle and P2P databases that supports human collaboration around innovative work. Tables combines half a century of organizational behavior research with lessons learned from building communities around cryptocurrencies. Tables is the first Tangle-based framework that attempts to simultaneously rethink how organizations are funded and formed while also functioning as a marketplace for discovering talent and work in a decentralized manner.

1. Background

**1.1 Introduction**

Since Bitcoin was introduced in 2009, we’ve seen the cryptocurrency market balloon from its humble beginnings to an industry-wide market cap of over [$442 billion](https://coinmarketcap.com/). During that time, global internet usage has [nearly tripled](https://www.statista.com/statistics/265147/number-of-worldwide-internet-users-by-region/), no doubt contributing to the cryptocurrency market’s success. As technology advanced and broadband access became more accessible worldwide, we’ve not only seen a rise in the cryptocurrency market but also an exponential rise in the global freelance economy, now a [$1.5 trillion market comprised of over 77 million people](https://advancedconsult.files.wordpress.com/2017/05/example-3.pdf).

As these trends are projected to continue, Tables intends to combine the power of the latest technology and couple it with a half a century of organizational behavior research to build a decentralized global ecosystem that connects the world’s workforce to limitless opportunities to engage in innovative work.

**1.2 Goals**

Tables envisions a heterarchical system for work that optimizes human collaboration for complex problem solving. We aim to realize this vision through building a decentralized global freelance economy where users have the ability to easily discover and be matched with work that aligns with their unique interests, skills, preferred work environment and payment structure.

Users develop their reputation on the network through positive interactions with others and completion of work. This reputation is then distributed through a decentralized ledger, providing incorruptible validation that a user possesses the expertise they claim and is able to consistently meet defined deadlines.

We believe Tables will allow members of the global workforce greater autonomy to choose where, when, how, and with whom they conduct business, and will ensure individuals are held accountable for their work and are appropriately recognized for their contributions.

**1.3 Previous Work:**

In Vitalik Buterin’s 2013 piece, “[Bootstrapping A Decentralized Autonomous Corporation: Part 1](https://bitcoinmagazine.com/articles/bootstrapping-a-decentralized-autonomous-corporation-part-i-1379644274/),” he posed, “The industrial revolution allowed us, for the first time, to start replacing human labor with machines on a large scale, and now we have advanced digitized factories and robotic arms that produce complex goods like automobiles all on their own. But this is only automating the bottom; removing the need for rank and file manual laborers, and replacing them with a smaller number of professionals to maintain the robots, while the management of the company remains untouched. The question is, can we approach the problem from the other direction: even if we still need human beings to perform certain specialized tasks, can we remove the management from the equation instead?” As the title suggests, Decentralized Autonomous Corporations (DACs) were conceived in an effort to test this question.

The concept of a Decentralized Autonomous Organization was first put forth by [Daniel Larimer in 2013](https://letstalkbitcoin.com/is-bitcoin-overpaying-for-false-security#.Ui-p9WTFT7s), and has since been described by [Morgen E. Peck [2013]](https://spectrum.ieee.org/tech-talk/computing/networks/ethereums-150-million-dollar-dao-opens-for-business-just-as-researchers-call-for-a-moratorium) as “taking all the functions of an investment vehicle—fund storage, project vetting and approval, fund disbursement, and profit allocation—and handling it on a blockchain, thereby creating what is effectively a corporation without jurisdictional anchors. Equally attractive to some is the fact that a blockchain-enabled organization is completely transparent and does not rely on a managerial class with high salaries to complete its functions. Everything is done by the code, which anyone can see and audit.”

An example of such a DAO is *The DAO*, which Peck [2013] goes on to explain, “...to play the game [become part The DAO], you send Ether (the native currency on the Ethereum network) to the contract address and you get tokens back in exchange. These tokens signify your proportional ownership over the mass of Ether poured into the contract….in order to unlock the funds people will present project proposals and the DAO owners will vote on whether the projects are worthy of investment.” There was so much interest in The DAO when it first came to market, that it raised over $150 million during its crowdsale, the largest crowdsale in history at that point in time.

DAOs in this sense can offer great examples of heterarchical work systems, or as [Crumley [1995]](http://onlinelibrary.wiley.com/doi/10.1525/ap3a.1995.6.1.125/full) outlines, “a system of organization where the elements of the organization are unranked (non-hierarchical) or where they possess the potential to be ranked a number of different ways.” As both humans and the innovative work they produce are complex, we believe a Tangle-based ecosystem of heterarchical DAOs, which we will henceforth refer to as “Rooms,” is the best framework to facilitate the formation of teams, which we will call “Tables,” around goals, rather than power.

If we are to subscribe to [Conway’s Law,](http://www.design.caltech.edu/erik/Misc/Conway.html) which argues that “organizations which design systems...are constrained to produce designs which are copies of the communication structures of these organizations” (CITE), or in other words, the product of an organization mirrors the communication structure of the organization it was built in, then when workers are building evermore complex, adaptive, and human-centric products and services, this requires an organizational structure (or lack thereof) that reflects this output. Tables intends to provide that organizational structure in the modern era.

We intend to build Tables on the Tangle network, rather than Etherium, because [Tangle](https://iota.org/IOTA_Whitepaper.pdf) makes it “possible to transfer value without any fees. Contrary to today’s Blockchains [which Etherium is founded upon], consensus is no-longer decoupled but instead an intrinsic part of the system, leading to decentralized and self-regulating peer-to-peer network” (Papov, 2017).

**1.4 Unique Value**

What differentiates the Tables ecosystem from the offerings of Steemgigs, Ethlance, Fiverr, Upwork and TaskRabbit, other than that it takes no fees and allows groups to fundraise for their projects, is its innovative design that matches individuals to work based a holistic picture of their individual preferences, including but not limited to: subject matter, payment structure, team dynamics, organizational structure, skill level, inherent interests and desired commitment level. Tables uses human-centered design to formulate teams aligned through a comprehensive picture of their collective *values*, rather than such simple metrics as one-off projects or dollars-per-hour. Tables was conceived with the purpose of bringing teams together to do complex work overtime without the burden and inefficiencies of having to maintain a conventional organization. To put it simply, Tables is more analogous to a network of diverse freelance *companies* than freelance *individuals.*

The Tables ecosystem

The Tables ecosystem is made up of *Hubs*, in which are contained *Rooms,* and at its smallest level, *Tables,* as defined below.

**Hubs**

Each hub encapsulates a proposition of the form "Let's improve x for p" with x here being the problem, and the p the target audience. Each room connected to this hub represents one solution to this proposition. Within a room, tables form to focus work in groups of similarly minded people engaged in providing useful developments toward the solution.

**Rooms**

Just as a Hub represents a problem proposition, a room represents one single solution to the Hub. To create a room, first a proposal must be drafted those wishing to build a room. A room is officially built when it receives the minimum funding (lumber) it specifies in its project proposal, which is provided to investors. The minimum funding takes into account the estimated cost of the project from start to finish including the base pay for everyone at the genesis tables, potential material costs (given out to individuals on a multisignature decision basis), and end game payout including positive (work successfully finishes) or negative (investor payment runs out without successfully finishing the project) outcomes. This is based on a given initial timeline outlying what goals the project aims to complete by a given deadline. Once this deadline is reached, the process to decide whether to continue a room or let it collapse commences. The lifetime of a room depends on this process, and the continued funding from investors into the room in exchange for Room Tokens.

**Tables**

Tables are the smallest denomination of teams in the Tables network. It is meant as a collaborative space where members can share data, communicate, and vote on issues with the interest of accomplishing a common, tangible goal. Teams around tables should be small and agile. Therefore, we are suggesting every table have a limit of the number of seats. These tables should also be extremely specific and time-bound in order to keep the entire network agile.

Add-ons:

Tokens

There are three types of token on the Tables network: Lumber, Trust, and Room. Each is used for different purposes and is vital to the sustainability and security of the network.

**Lumber tokens (LB)**

Lumber tokens are required to participate in the Tables Ecosystem. In order to join a table and begin contributing, there must be an initial deposit of lumber. This "proof of lumber" solves a variety of problems including mitigating spam as well as ensuring all members participating in a table are invested in the health of the network as a whole.

All currency must first be converted to our network tokens

If all tokens of fiat currencies need to convert to out token, then the system should provide a system like USDT. In USDT system the money is saved somewhere and not spent! And every time people are able to convert back their money to the original form which is USD in USDT.

**Trust badge (TST)**

After having put in a deposit of 1 LB, users will receive 1 unique Trust token when they join a room. Trust token gives the user the right to build a table given they have enough reputation to do so, vote on issues regarding the room including voting on reputation after a table collapse, and in the case of a closed room, the ability to have access to all the data shared in the room. The TST does not expire until the room collapse, when it is then converted back into LB, or until the user is exiled from the room. A user is exiled from a room when all users within the room agree they have performed in a manner which requires removal. Once exiled, the user’s TST is taken, converted into LB, and placed into the vault for estimated costs. The resulting LB does not contribute to “extra” pay to each individual, and may also be used to grant another user TST if replacement is necessary.

**Network reputation**

Do people get more reputation if they have done more work?

Reputation is key to building on the network and working at tables, but is hidden to the rest of the network and only the user will be able to view the rating.

* Every person begins with

Users’ reputation will be defined at time of

* Table collapse / completion
* Room collapse / completion

What you can do with reputation

* Build tables
* Contribute to the building of hubs

The formula for scores will be formulated

**Skill ratings**

As mentioned above, users will denote their skills

**Matching algorithm / Distributed AI**

There has been always a big question in work economy: With such advancement in AI, can machine learning algorithms solve one of the most complicated of work economy—matching a person to a job—better than actual humans can?

Machine learning algorithms are fast emerging as the brain of machines. There are many companies that are using machine learning algorithms to evaluate human qualities and insights for different purposes. Deep Neural Network is part of a broader family of machine learning algorithms that has been applied to different fields including text mining, computer vision, audio processing, social network analysing, human behavior analyzing by different companies such as Microsoft, Google and Amazon.

With the recent advancements in AI, we are planning to use Deep Neural Network for solving complicated problems in work economy. These problems include but not limited to analyzing projects, understanding human skill and insight, matching people to projects and based on their skills and project’s needs.

In the proposed decentralized heterarchical work economy (Tables), there are 4 entities including worker, table, hub and x. In Tables, each entity has some decentralized features and information. For example, worker as a user has following features and information:

* Skill sets
* Insights and personalities
* Employment and Academic histories
* Historical information about user’s activities and feedbacks on Tables network

In Tables, using above information and Deep Neural Network, users will be matched to particular tables and vice-versa. Following figure

Performance, scalability, and security

Building upon the Tangle protocol means more performance as we add more users to the network

Table coins are put into a table as a deposit to stop attacks

**Tangle**

While the tangle is required for providing a distributed state, individual tables or rooms may require data that simply does not need to be stored on the shared ledger. This data can be communicated through a peer to peer subnetwork in order to allow high throughput communication for applications such as Filesharing, Video Conferencing, or even real time VR interfacing.

Tangle scales indefinitely, especially when distributing parts of the tangle over different nodes as the tangle will become too big for a single full node to manage. Since the full nodes are the actual entry points into the tangle for all users, these full nodes will service all queries and transactions for their specific Sub-Tangle.

Tangle achieves the decentralization is purely combination of technical and evolutionary new blockless distributed ledger. To understand the aspect of decentralization of Tangle , we have considered technical aspects of decentralization.

**P2P**

“Decentralized network consisting of peers (or nodes) which are connected with each other and perform some form of data sharing with each other”.

Peer-to-peer Electronic distributed network provides actual vision of Satoshi. User can exchange the data or money anywhere in the world instantly and mitigate the problem of centralized .

Peer-to-peer (P2P) transactions that eliminate or minimize the need for centralized authorities, such as banks, or big data centers.

Using P2P, system can leverage following to the Network

* Security, Reliability, Infinite Scalability
* Infinite Network capacity
* User participate as equals as other peers.
* User can part of legal and ethical decision over the network.
* Provide the open market and open internet.
* Free transactions.

**Upgradability**

How to make changes throughout the entire network

Roadmap

Token sale / structure

P2P Subnetwork Development

Future considerations

**Room tokens (RM)**

Investors can purchase unique Room tokens in exchange of Lumber tokens in order to participate in its curved Curated Market. RM can be sold at any point to get out an appropriate reward that is set by a sell curve. The LB tokens used to buy RM tokens will funnel directly to the room’s vault where the LB will be distributed amongst its members according to the rules of that particular room. RM tokens do not grant voting rights within the room.

**Payout structure**

The payout structure fundamentally solves two questions. Where does the money come from and how is it distributed? In the following section, we outline the balance between workers and funders to create a symbiotic system allowing both workers and investors to negotiate decisions around funding.

1. Rooms

Rooms are initially funded based on the curation markets of their Room Token. Investors can exchange lumber for Room Tokens which represent equity for that particular room. As the room’s value increases depending on the volume of its token, investors are rewarded for adding capital earlier. The lumber paid in exchange for these Room Tokens enters a vault that distributes the funds following rules designated by the proposal creating the room. This allows rooms flexibility in allocating funds how they see fit, but also requires them to keep investors happy in order to keep capital flowing in.

1. Tables

Each table has access to a specific portion of the vault which is highlighted when the

~~Upon completion of the goal either through reaching the expiration date or through consensus, each table has the opportunity to decide its own payout structure. However, in the assumption that workers will follow a system if it is in their interest for everyone to do so, we have outlined a system of payout defined as the following:~~ Each table has access to a specific portion of the vault which is highlighted when the room is originally created and fully funded. Each table’s portion is broken down into three sections - individual user base payment to start the project, estimated costs not associated with Table user labor, and endgame payout for when the table collapses. The first - individual user base payment - is specified before a user chooses to join a table. The owner of the table may choose to share the payout of the seat openly, or to allow users to set their payout. The endgame payout is calculated using the following formula:

BP represents the Base Pay for each user at a table,

Conclusion

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