Deconet

Whitepaper

Decentralizing the Knowledge Economy

Attention, Inc

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contact@deco.network

ABSTRACT

As humans digitize an increasing portion of the world's information, each economic sector is transfigured by and incorporated into the knowledge economy, the economy that exists at the intersection of human creativity and digital capacity. Yet, knowledge economy projects remain undifferentiated in structure and governance, and undercapitalized. Crowd-curated project cooperatives and asset marketplaces, along with the financial rails necessary to support them, offer the potential for much greater collaboration across the knowledge economy.

Our goal is to catalyze this collaboration. We envision a world of digital cooperatives that redefine the future of knowledge work, enabled by a freely proliferating diversity of project ownership, governance, and capitalization structures.

To realize this potential, we propose a software platform that matches projects with knowledge workers and digital assets. Four core interlocking mechanisms enable this:

- Standardized smart contracts designed to facilitate collaboration while lowering transaction risk and cost.
- A decentralized registry and repository for platform participants to list and access digital assets, APIs, and projects through a user-friendly dashboard.
- Crowd-curation mechanisms to assure quality of work offered and requested.
- A native platform token to quantify and reward knowledge workers and curators with fair value for their work.

This combination will enable variously collaborative structure, ownership, and governance—first for software development, and, with time, for intellectual property, medical research, and metadata, and other digital assets.

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1 CONTEXT

In 1937, Nobel laureate in economics Ronald Coase argued that while some production can be efficiently coordinated through market exchanges, transaction costs make the market ill-suited to other production activities. In these cases, forms of organization (which he termed *firms*) emerge where "entrepreneur-coordinators" develop more efficient means of facilitating production.[1] Eighty years later, humans continue to invent ways to organize firms and markets to coordinate our shared activity more efficiently, fairly, sustainably, inclusively, and effectively. As the physical, computational, economic, social, cultural, and political constraints upon this invention continue to break down, its pace and character have recently begun to undergo a state change.

A variety of recent phrases capture the emerging economic forms that embody early manifestations of this shift, such as *knowledge economy*, *gig economy*, *digital economy*, *network economy*, *sharing economy*, *information economy*, *on-demand economy*, and *platform economy*. Economists attribute these emerging forms to a complex intersection of trends[2] both social and technological. They include:

- The proliferation of peer-to-peer networks.
- Increased digital representation of information.
- Sustained and exponential price performance growth of digital hardware, software, and communication technologies, notably including those that support and interact with the internet.
- Increased modularity and programmability of hardware.
- Technologies that physicalize the digital (e.g. 3D printing, additive manufacturing, augmented and virtual reality).

[1] Coase, "The Nature of the Firm," 1937, p. 388.

[2] See Sundararajan, "Laying the Tracks: Digital and Socioeconomic Foundations." Chap. 2 in *The Sharing Economy*, 2016; McLaren and Agyeman, *Sharing Cities*, 2015; Varian, "Computer-Mediated Transactions," 2010; Wolfgang, "International Trade, Foreign Direct Investment, and Technology Spillovers," 2010; and International Monetary Fund, "Is Productivity Growth Shared in a Globalized Economy?" Chap. 4 in *World Economic Outlook, April 2018: Cyclical Upswing, Structural Change*, 2018.

- Technologies that digitize the physical (e.g. "Internet of Things", advanced robotics).
- Increased international trade and investment.
- Urbanization.
- Technologies that enable semi-anonymous trust across digital networks (e.g. methods of reputation, verification, incentivization, & cryptography).

Each cause is ongoing, suggesting that the shift towards radically diverse forms of collaboration and cooperation is only beginning. These forms bring together specialized knowledge workers, investors, and digital assets across geographies to team up over periods of days to months. As hybrids of Coase's *firms* and *markets*, they create and distribute value using both exchange-based and non-market-based coordination mechanisms.

Deconet offers knowledge workers and investors within the knowledge economy a crowd-curated marketplace that enables them to incentivize, invent, and execute within new forms of collaborative production. As in so many areas, we believe that coders are among those at the forefront of collaborative work, developing future workforms increasingly characteristic of the knowledge economy. For this reason, the first phase of long-term Deconet platform development focuses on serving the coder community and clients that require custom software development.

2 PRESENT STATE

While much change is underway, intransigent challenges impede the exploration of project ownership, governance, and capitalization structures. These challenges can usefully be understood at the level of the knowledge economy, the gig economy, and the code economy. Reviewing them, we offer in each case Deconet's points of difference.

2.1 Challenges: the Knowledge Economy

The knowledge economy deals in what economists term *knowledge-based capital* (KBC): "computerized information (software and databases), innovative property (patents, copyrights, designs, trademarks), and economic competencies (including brand equity, firm-specific human capital, networks of people and institutions, and organizational know-how that increases enterprise efficiency)."[3] The ways we develop and deploy KBC increasingly determine the wealth of nations. For instance, its contribution to economic growth[4] over the period 1995-2006 is estimated at "close to one-half in Sweden; one-quarter in the United States and Finland; [and] roughly one-fifth in France, the United Kingdom, Czech Republic and Australia."[5] Despite this centrality, inherent allocation challenges impede the efficient development and deployment of KBC.

2.1.1 Under-Investment

Because KBC is intangible, accounting frameworks—which provide the basis for the extension of credit—have difficulty valuing it. This makes it challenging to collateralize, resulting in suboptimal levels of investment.

[3] OECD, *Supporting Investment in Knowledge Capital, Growth and Innovation*, 2013, p. 22.
[4] Amounts cited represent percentage contributions of knowledge-based capital to multi-factor productivity growth. Multifactor productivity is a residual measure of the efficiency with which an economy deploys its inputs. Economists have shown that persistent gaps in levels of multifactor productivity account for most of the difference in income per capita across countries. See Fig. 2 in Easterly and Levine's "It's Not Factor Accumulation: Facts and Growth Models," 2001, p. 189.
[5] Andrews and Criscuolo, *Knowledge-Based Capital, Innovation and Resource Allocation*, 2013, p. 13.

Deconet is **different.**

Deconet offers investors the ability to co-fund projects, and co-license rights the digital outputs of those projects. Many such investors are also entrepreneurs, who develop products to reap licensing income from them. The Deconet platform makes licensing digital assets quick and easy, reducing the risk and time cost associated with this form of KBC.

2.1.2 Under-Acquisition

The tacit knowledge and specialized skills of digital workers are embedded within the workers themselves. To acquire the KBC that resides within knowledge workers, firms typically have two options: 1. hire specialized talent from another firm, or 2. engage in corporate acquisitions. Both of these approaches are highly inefficient.

Poaching specialized talent only makes sense when the hiring firm requires long-term and full-timer specialized talent. There is also no guarantee against reciprocal poaching from another competing firm. Poaching KBC talent may also punish the knowledge worker, as when her pension, healthcare package, stock options, etc. are not portable from one firm to another. These challenges combine to disincentivize both firms and individuals, significantly dampening knowledge labor market mobility.

The second option, corporate acquisition, is highly risky for two reasons. First, despite five decades of empirical research, a consistent formula for M&A success remains elusive.[6] Second, when one firm acquires another to access the specialized KBC of its employees, firms assume even greater risk, since those employees remain free to leave the firm after it is acquired, taking their specialized knowledge with them.

Deconet is **different.**

Deconet offers firms the ability to source KBC more quickly and inexpensively while incurring less risk. It offers entrepreneurs the ability to respond to and anticipate

[6] Das and Kapil, "Explaining M&A Performance: A Review of Empirical Research," 2012.

firm-based demand for KBC more effectively by more efficiently coordinating digital assets, knowledge workers, and investors.

2.1.3 Under-Facilitation

Few institutional frameworks exist to facilitate knowledge-work collaboration that is cross-disciplinary, inter-institutional, and creates broadly shared KBC. While government research and development efforts can serve this function, the evidence of their efficacy attests to mixed results and, often, unintended consequences.[7]

Deconet is **different**.

Deconet was designed from the outset to facilitate collaborative knowledge work that is cross-disciplinary, inter-institutional, and creates broadly shared KBC. The Deconet community is discipline-irreverent and committed to modular interoperability. The Deconet platform knows we don't have all the answers. So, we remain model agnostic, encouraging our users to create the most efficient, fair, sustainable, inclusive, and effective collaborative structures possible.

2.2 Challenges: the Gig Economy

The gig economy deals in variations and combinations across three work structures: microtasking, work-on-demand, and contests.[8]

- Microtasking

  In microtasking, a firm breaks down traditional full-time work into brief and simple tasks (e.g. translate a single word, pricecheck a single item), for which they offer low compensation per task.

[7] See, for example: Hall and Reenen, "How Effective are Fiscal Incentives for R&D? A Review of the Evidence," 2000; Elschner et al., "What the Design of an R&D Tax Incentive Tells About its Effectiveness," 2011; and Hall and Maffioli, "Evaluating the Impact of Technology Development Funds in Emerging Economies: Evidence from Latin America," 2008.
[8] Kirven, "Whose Gig Is It Anyway," 2018; Felstiner, "Working the Crowd," 2011.

- Work-On-Demand

  In work-on-demand, a platform company matches workers who perform medium-duration, medium-skill tasks (e.g. delivery, home repair, taxi service) with customers at or near the place and moment of need. In response to shifts in customer demand, work-on-demand firms rapidly scale the availability of workers on their platforms up or down. They typically offer medium compensation per task, of which they deduct a portion.

- Contests

  In a contest, a company offers high compensation in exchange for completion of a long and complex task. Many entrants submit (often valuable) submissions. While the compensation is large, the company only pays once (to the winner); other entrants' work is generally neither compensated nor credited.

Compared to older economic forms, gig economy firms offer workers greater autonomy and consumers lower prices. Nevertheless, they do so at significant human cost.

2.2.1 Precarity

It is a widespread misperception that most who work in the gig economy do so to supplement their regular income. In fact, these constitute a minority. In the United States, for instance, where 1 in 3 workers take part in the gig economy, 60% do so as their primary source of income.[9]

Gig economy tasks either have low probability of being paid (contests) or generally last less than a day (microtasking and work-on-demand). As a result, from one day to the next, gig economy workers have little certainty how many tasks a given day will bring. Among the majority who depend on tasks as their primary source of income, the resulting precarity causes much anxiety. To gain a modicum of financial security, on-demand workers may choose to make themselves available to work 7 days a week, or in the predawn hours when there is less competition from other workers.[10]

[9] McKinsey & Company, *Independent work*, 2016.
[10] Singer, "In the Sharing Economy, Workers Find Both Freedom and Uncertainty," 2014.

Deconet is **different**.

Deconet recognizes that knowledge workers, like all workers, are human beings with lives. We all need to anticipate and plan around our work. The platform therefore encourages knowledge workers and clients to cooperatively negotiate projects that are comprised of one or more mutually agreeable and prepaid multi-week milestones. Platform features conducive to innovative project financing should also support such lengthened time-horizons.

2.2.2 Dehumanization

Decades of psychological research confirm that when one psychologically normal human is given authority over another, where their authority is anonymized and diffused with that of others, and where the latter is both isolated and deindividuated, the former will brutalize the latter.[11] Tragically, gig economy platforms create just such predictably dehumanizing conditions. Fearing potential labor organization, gig economy platforms isolate workers, discouraging or forbidding them from communicating with one another. Fearing too much contact by customers, many gig economy platforms also obscure their workers' identities and minimize differences among them—the very definition of deindividuation. Finally, in a misguided effort to maximize communication efficiency, directives from gig economy employees to workers are nearly always anonymized, articulated as directives from the platform rather than the responsibility of any particular person. Given what we know about the combination of anonymity, diffusion of responsibility, isolation, and deindividuation, it is unsurprising that gig economy platforms routinely and brutally reduce workers to a lowest common denominator of hours reported, boxes per hour, or clients satisfied.[12]

Deconet is **different**.

Deconet knows that over-focus on "bad apples" too often obscures the responsibility of bad barrel-makers. In other words, we can design situations and

[11] See Zimbardo, *The Lucifer Effect*, 2008, Chap. 1, 10, 12, 13, and 15.
[12] Asher-Schapiro, "Against Sharing," 2014.

systems that bring out the worst or the best of human behavior. Unlike the gig economy platforms, Deconet is determined to take the latter path. That's why the Deconet community is pulling from positive psychology, behavioral science, and gamification to design systems that support effective, ongoing, and mutually empowering collaboration. Where possible, Deconet motivates our users towards such collaboration with tools that cue our drives to mastery and accomplishment, to creative self-efficacy, to epic meaning and purpose, and to sociocentrism rather than egocentrism.

2.2.3 Monopsony

Gig economy platforms often enjoy near-monopsony status, effectively being the only local conduit for the purchase of a particular type of labor. Such leverage enables platforms to demand higher percentage fees and offer lower wages than a competitive market would allow.[13]

Deconet is **different**.

Deconet is not and will never become a monopsony. We believe the best work gets done among people who feel they are being treated fairly. That's why we encourage and empower clients and knowledge workers on the platform to negotiate mutually agreeable terms that not only foster trust, but also create abundant shared value.

2.2.4 Asymmetry

Work-on-demand customers rarely have skin in the game. A low rating from a worker is unlikely to seriously impact their life. Yet a low rating from a client may substantially undermine a worker's wages. Customers know this, and commonly use their leverage as a bargaining tool.[14]

[13] Webster, "Microworkers of the Gig Economy," 2016.
[14] Heller, "Is the Gig Economy Working?", 2017.

Deconet is **different.**

We know it is important for everyone to know that their actions have positive and negative consequences for others. That's why Deconet carefully designed its two-way ratings and reputation systems so that both client and knowledge worker are invited to communicate with one another before an issue impacts a rating or review. Feedback tools are designed to educate users on how they can improve their performance, and, along with token-based incentives like staking, prevent ratings abuses.

2.2.5 Secrecy

To guard against competition, nearly all gig economy platforms hoard their data. User profiles, reviews, work history, and other data are walled off, even from the people who create them.

Deconet is **different.**

Deconet has no interest in hoarding user data. Where users permission it, we keep data transparent and public. Otherwise, Deconet users maintain and control their own data in a decentralized fashion.

2.2.6 Autocracy

Generally, gig economy workers have no authority in platform governance or in the operational design of their work. They are caught by surprise when the platform announces a rate cut or changes the process by which it matches workers and customers. With no role in governance, dissatisfied gig economy workers have few options: They may accept company mandates or they may leave.[15]

Deconet is **different.**

[15] Singer, 2014.

Deconet's power resides in its users, period. That's why we're developing out a user-driven network governance structure that gives our core user groups—knowledge workers and clients—real say in Deconet's most core decisions.

2.2.7 Mundanity

Neither the gig worker's creativity, nor her thought, nor her experience is invited to contribute to the design of her work. Microtask workers are often not even informed of the purpose behind a task, so they have no idea what they are even working on! We human beings have a psychological need to make meaning of our existence. Frequently, gig economy work denies this.

Deconet is **different**.

From project inception and design through project completion, the Deconet platform is designed to elicit, not to deny, the knowledge worker's thought, creativity, and experience. Clients know that extraordinary projects bring out the extraordinary in Deconet knowledge workers—extraordinary commitment, extraordinary insight, and extraordinary value.

2.3 Challenges: the Code Economy

At present, collaborative software development is characterized by fractured information and poor incentives. As a result, developers often needlessly compete on projects that could be better addressed collaboratively. Five challenges result from this harmful non-collaboration.

2.3.1 Redundancy

The functional assets that comprise code are generally private. It takes 3-5 months to develop a typical mobile application.[16] Yet, that development effort usually contributes to only one application. The generalized process of app development consists of nine steps:

1. Identify features for implementation.
2. Roadmap feature development, outlining features for implementation.
3. Begin next feature development.
4. Source open-source feature assets from Stack Overflow or similar sites.
5. Modify open-source assets to fit feature needs specific to the project.
6. Test the feature for functionality.
7. Combine with any existing features.
8. Test for interoperability.
9. Repeat steps 3-8 until app is complete.

Open-source assets of common features are often unavailable, and developers must rebuild features and solve problems that others have previously built and solved in different contexts. Once a feature is completed, developers who release it to the public are not rewarded for their contribution. Further, no simple way exists for developers to search among open-source features.

> Deconet is **different**.
>
> Deconet provides a robust marketplace to meet developers' need for reusable digital assets.

2.3.2 Incompatibility

Any seasoned developer has been down the rabbit hole of chasing dependencies. For example, there are two main JS crypto packages, crypto-js and crypto. Each provides the same function, but differently. A developer may use both packages in her app, leading to redundant code and increasing the probability of future bugs.

[16] Appster, "How Long Does It Take to Develop a Mobile App?" 2017.

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The Deconet Asset Market only lists items for which compatibility is explicitly known and articulated.

2.3.3 Quality

Application developers receive no assurances of asset quality or correctness. While developers may leave community feedback on download sites, no quality assurance system exists to collect and distribute this critical information.

Deconet is **different.**

The Deconet Asset Market is rigorously curated using a token curation system. The result: Only digital assets that meet high standards of quality, disclosure, and correctness standards can be featured on the platform.

2.3.4 Illegitimacy

Much asset knowledge work cannot be compensated. Enterprises have compelling reasons to use open-source software. By doing so, they maintain the ability to customize, and remain free from vendor lock-in.[17] As a result, over 95% of enterprises use open-source software.[18]

Nevertheless, enterprises are limited in the open-source software they may use in proprietary environments due to embedded software licenses, such as the copyleft GNU General Public License (GPL). No mechanism exists to purchase an exception to the GPL from the open-source developer. In these cases, enterprises often pay large sums to companies like Red Hat to assume liability for the lapse in compliance.

Deconet is **different.**

[17] Black Duck Software, "The Tenth Annual Future of Open Source Survey," 2016.
[18] Black Duck Software, "2016 Future of Open Source Survey Results," 2016.

The Deconet Asset Market lets users license assets they own quickly and easily. Though they may use any license, the default is the GNU General Public License (GPL).[19] Deconet enables knowledge workers to apply, list, and sell exceptions to the GPL with a few mouse clicks via a proprietary license specifically written for blockchain based purchases.

2.3.5 Imprecise Compensation

Few multi-contributor open-source projects have processes for distributing the donations and revenue they receive. Some non-profits, such as Open Collective, provide partial solutions. Yet those that compensate multiple knowledge workers generally credit all knowledge workers or all code equally. This approach fails to account for differences in the value that a given developer, or a given piece of code, generates.

Deconet is **different**.

On the Deconet Asset Market, funds can arrive either via donation or commercialization. If the parties can agree verbally, they can codify fund disbursement and distribution terms without need for a governance tool. Alternately, if preferred, governance tools like Aragon and DAOstack can be readily layered on top.

[19] Free Software Foundation, "GNU General Public License," 2007.

3 GOAL STATE

Deconet aims to radically enhance the global knowledge economy. The goal state is a world in which teams of knowledge workers are compensated for work they enjoy: co-creating projects that contribute sustained value. Deconet's vision is model agnostic. We believe that by creating thick and liquid markets that support the full range of cooperative and compensatory models, users will be free to develop and choose the most efficient, fair, effective, and sustainable forms of work organization.

4 PATH[20]

4.1 Asset Market

4.1.1 Overview

An *asset* denotes a digital resource that provides utility without further input from the knowledge worker(s) who created it. In the Deconet Asset Market, assets can be configured to engage in automatic activity on the platform without necessitating the real-time or direct involvement of their owner(s). An *owner* is an individual, group, or business entity that has the right to list and receive revenue from sale or license of an asset.

Assets can be nested, such that asset outputs of one project may become inputs to other projects, which themselves output new assets. In the Deconet asset market, owners can efficiently sell and license their functional and reusable work. This more fairly compensates owners and developers for the value of their work. Moreover, with expanded access to assets useful as project inputs, Deconet teams finish better work faster.

The asset market connects owners who license assets with knowledge workers who want to use those assets as inputs to their projects. In the context of Deconet, a *knowledge worker* is an individual, group, or business entity that applies their knowledge, skills, or abilities to add value to projects in exchange for payment. As detailed in the Project Market section below, knowledge workers on the platform may sell their individual effort directly, but more often form into *teams* with other knowledge workers. Teams denote one-time or repeated configurations in which knowledge workers collaborate on projects.

Deconet offers asset owners a simple process for listing an asset they wish to make available for sale or license. Code and service offerings can be submitted to the Asset

[20] Note that this *Path* describes the Deconet platform as it is envisioned. In the interest of legibility, we articulate this vision using the present tense. Deconet is expanding; not all of the components described are yet complete as of this writing.

Market as easily as adding assets to any registry like npm, or listing an API on a gateway like Kong. An owner can list her asset as open source, available for long-term license, for sale, or licensable for one-time use. The default and recommended license is the popular GNU General Public License (GPL).[21] Deconet enables asset knowledge workers to sell exceptions to the GPL.[22] However, asset knowledge workers are free to apply any license they wish. Looking ahead, Deconet will consider introducing new software licenses that leverage the unique properties of blockchains.

By completing a simple form, an asset owner populates a smart contract with information about the asset and the terms of its availability. Now, any Deconet user may license or purchase the asset by sending digital currency to the smart contract address in the amount and of the type specified in the contact.

The smart contract logs the licenser's address and the transaction data to the blockchain. Since the parameters of the transaction are unique, and specified within an immutable registry, both owner and licenser enjoy confidence in the length and terms of asset access.

Assets are autonomous, programmed to engage in activity on the platform without the real-time or direct involvement of their owner(s). This not only benefits asset owners by streamlining the receipt of any license revenue they require for use of the asset, but also benefits the Deconet knowledge worker community, as it deepens the breadth of licensable assets available for immediate use.

[21] Free Software Foundation, "GNU General Public License," 2007.
[22] Selling exceptions to the GPL is considered morally sound by Richard Stallman, the foundational voice of the free software movement. See Stallman, "On Selling Exceptions to the GNU GPL," 2010.

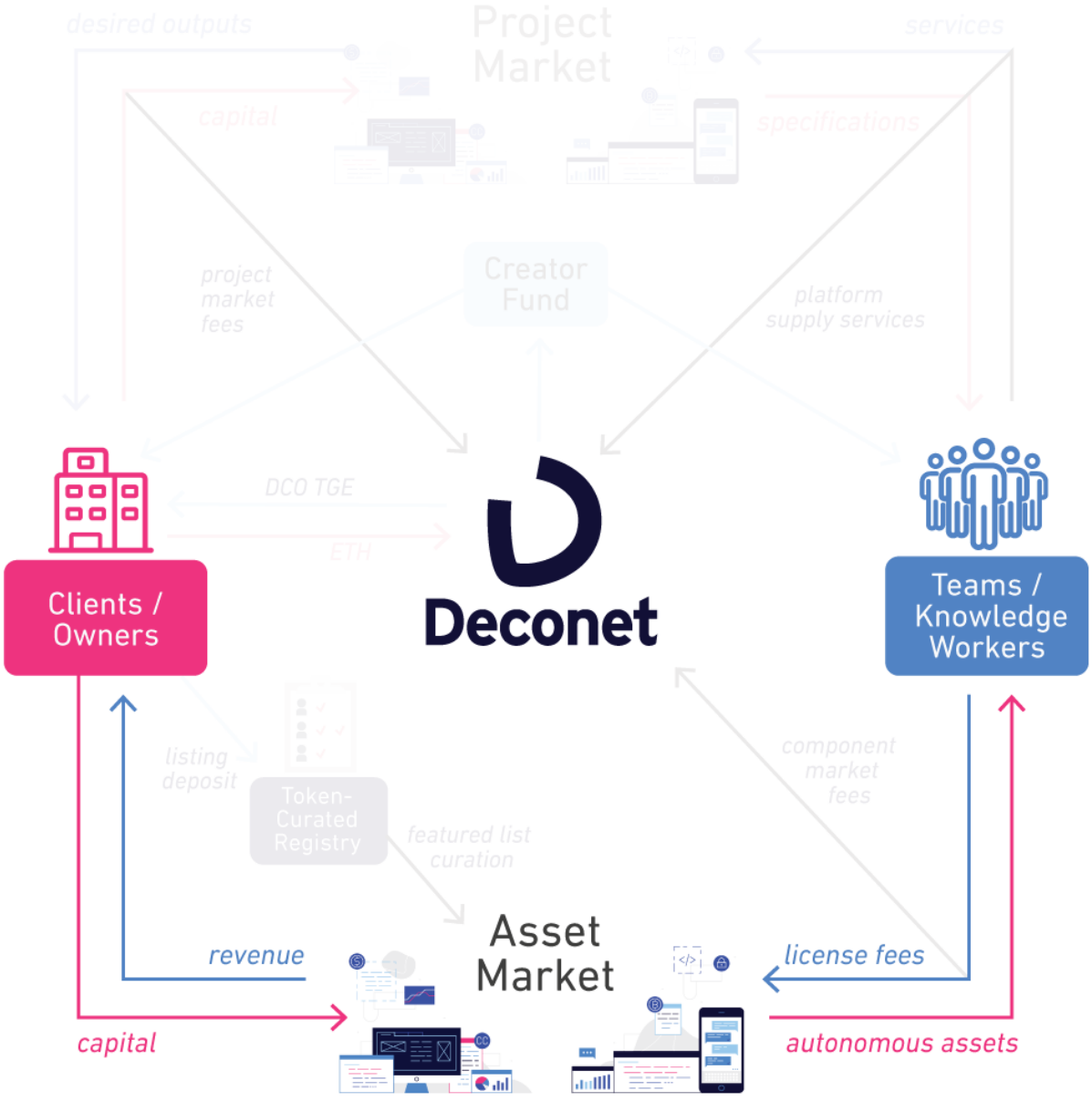


Figure 1. Asset Market

4.1.2 Curation

A "featured" list of assets on the Deconet asset market is curated through a token-curated registry (TCR). The process for deciding which market-listed assets will be featured is characterized by carefully crafted token design and protocol incentives. These incentives

deploy a game theoretical model to strongly incentivize all participants to curate the registry collectively.[23] An overview of these incentives, along with the token curated registry workflow, is pictured at Figure 2, below.[24]

DCO, a native network token, enables decentralized participation in market curation. DCO holders curate the asset market by participating in a partial-lock token-weighted voting scheme regarding which listings will be featured on the asset market.

We anticipate four roles in the token-curation of featured assets: consumers, applicants, voters, and challengers.

1. Consumers (i.e. knowledge workers) require a high-quality registry to discover the best assets to use within projects they execute. The higher the quality of the market, the more attention it receives from consumers, and the more applicants seek inclusion on Deconet.

2. Applicants are owners whose assets have not yet been featured on the asset market. They want their assets to be featured to receive the attention of consumers, who may select the assets they own to license or buy for their projects.

3. Voters, token holders who participate in maintaining the registry, are motivated to curate a high quality list of featured assets.

4. A market that maintains higher quality featured assets is made possible by challengers. Challengers risk their own tokens to guard against subpar quality featured items. When voters side with them in finding a particular item insufficient, challengers stand to gain.

Deconet users can access a large array of pre-built and proven assets, APIs, and other packages and projects, enabling them to build better applications faster. Deconet assets and microservices abstract a wide range of complexity to support knowledge workers on the platform. This includes third party services, libraries, user interface widgets, plugins,

[23] Goldin, "Token-Curated Registries 1.0," 2017.
[24] We are grateful to designer Eva Shon, on whose TCR Workflow this illustration is based.

and connections to decentralized protocols. For projects that require blockchain-specific assets, the platform offer an array of microservices, including support for deploying an Ethereum wallet, integrating with a KYC vendor, setting up a crypto token based on a Reddit-style comments section, and exchanging ERC20 tokens with ETH.

Deconet is built on Git, the world's most popular version control system. It is neither limited to one category of assets nor to one programming language. Knowledge workers may access these assets via a command line tool and the user-friendly Deconet web portal.

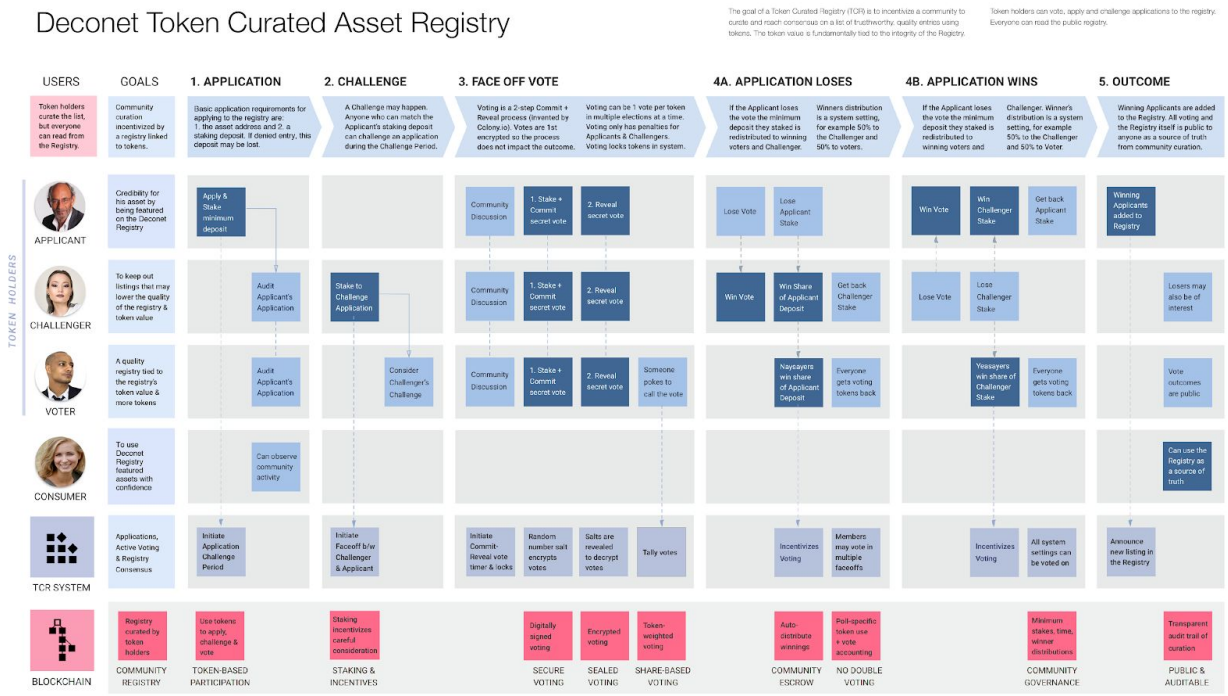


Figure 2. Deconet Token Curated Asset Registry [(click to enlarge)]

To participate in the TCR, applicants must stake DCO. Furthermore, to maintain an asset on the featured list, each successful asset must be accompanied by a listing deposit, which is refunded at such time as said asset is removed from the list. A portion of DCO will be sold during the DCO pre-sale. See Figure 3, below.

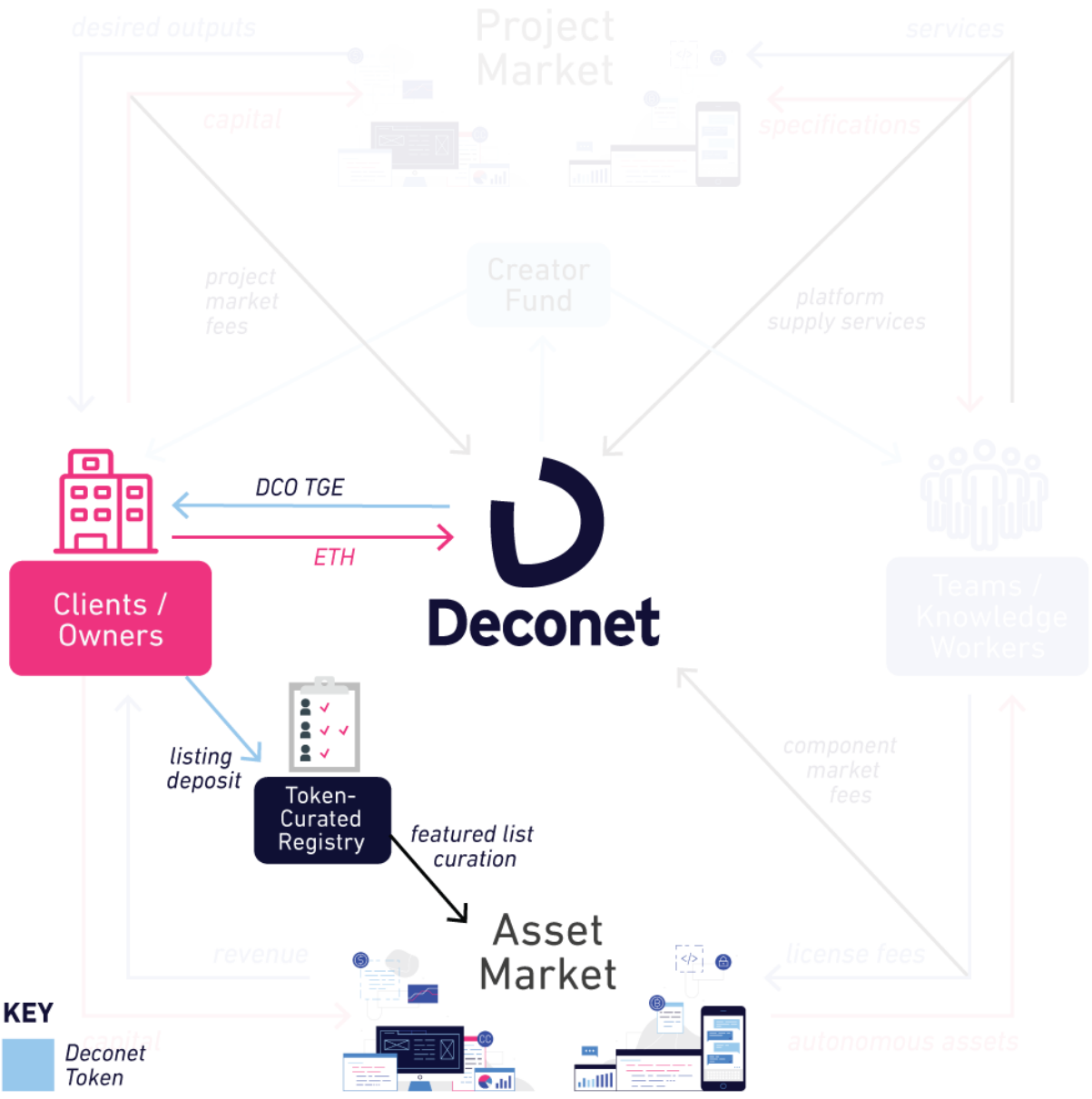


Figure 3. Featured Asset List Token Curated Registry

4.2 Project Market

4.2.1 Overview

A *project* is a shared, goal-oriented effort undertaken by a subset of Deconet knowledge workers. In addition to the work of knowledge workers, projects may include assets as inputs. The project market matches appropriately skilled individuals and teams with the

projects that require those skills. It offers knowledge workers the world over opportunities to contribute their valuable abilities to the projects they find most compelling. Some of these participants have worked together in the past; others have formed lasting teams where they have refined repeatable roles and processes; still others may be collaborating for the first time.

In the context of Deconet, a *client* is an individual, group, or business entity that provides a project with financial capital. Clients input capital and specifications to an array of knowledge workers in the project market. Specifications may include desired outputs, anticipated milestones, anticipated timeframe, desired level of communication with the team, and details regarding how milestones are to be achieved.

The client of a project may accord herself partial or full ownership of its asset outputs. Similarly, knowledge workers may specify partial or full ownership of project asset outputs as a condition of their participation in this project or in any project.

Deconet offers smart contracts that are readily customized to support the development, sale, and licensing of digital goods and services. Many models of digital cooperatives and asset sharing exist. Others are currently under development.

Deconet is model-agnostic. The protocol and rules of a Deconet smart contract provide payment rails that support a variety of cooperative and compensatory structures. Sellers, such as owners of an asset, or teams of project knowledge workers, may specify how money they receive will be distributed. They may structure payment to be required upon receipt, over time, or contingent upon the achievement of particular milestones.

On the Deconet platform, project progress is marked by *milestones*. A milestone is an objectively verifiable state, change, or event in a project. Completion of a project's final milestone constitutes completion of the project.

Funding a project is more complex than purchasing an asset. An effective project is fairly compensated, executed in good faith, responds dynamically to unforeseen challenges, is completed on time and within budget, and achieves its output *goals*, defined as the stated

and measurable aims of a project. While these aspects of efficacy may be difficult to quantify, we believe that many repeatable steps involved in funding global knowledge work can be routinized to the benefit of knowledge workers and clients.

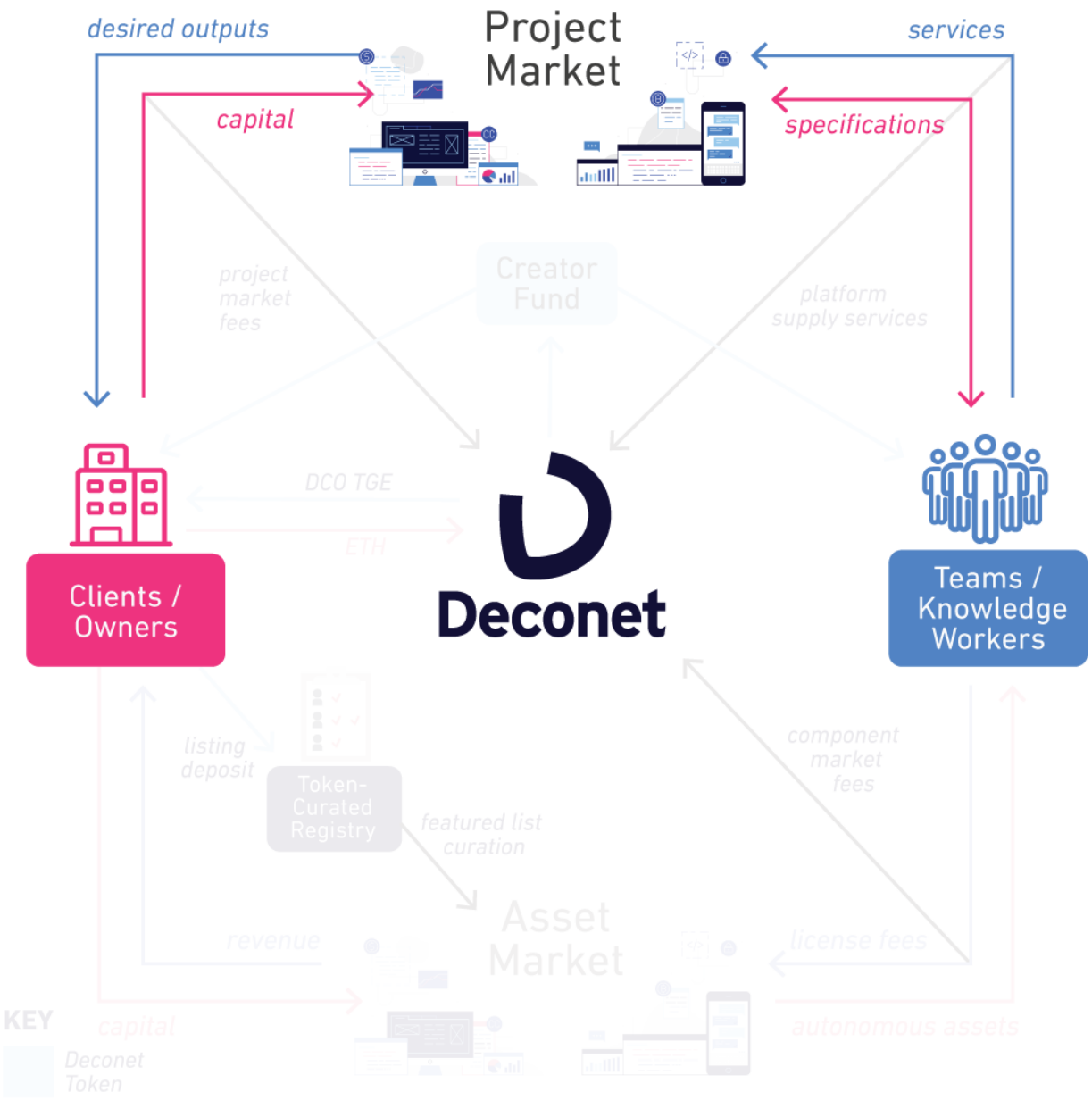


Figure 4. Project Market

Deconet will continuously learn from and work with its users to understand the combination of platform elements—such as rules, editable templates, user choices, and default options—that most lend themselves to effective project execution.

4.2.2 Project Journey

Below, we sketch an overview of the path of a Deconet project, from inception to completion. Note that the following steps assume a complex, multi-step project in which each earlier milestone may significantly inform the scope of later milestones. We anticipate that the Deconet platform will accommodate a range of projects, from fixed scope/price to agile, and that typical project steps will vary accordingly.

Step 1

A client/owner lists a project on the platform, specifying its category, title, description and budget in crypto or fiat. The client can also specify the requirements for knowledge workers. To be listed on the platform, the client must demonstrate willingness to pay for the project requested. She does so by sending in cryptocurrency the funds necessary to complete the first milestone along with a trust agent[25] fee to the smart contract associated with her approved project request. For projects in which the application process requires a fully scoped quote, the client submission includes a fee designated for compensating unsuccessful good faith applicants. If the project meets these project request requirements, platform curators approve the request, and it gets listed.

Step 2

Once the project request is listed, knowledge workers can view and evaluate it. They may consider the client's prior work history and reputation on the platform. In addition to private messages, they may send project-specific questions to the client. Answers to these are appended to the project request.

[25] Trust agents are disinterested and randomly assigned to each approved project. The client pays the trust agent fee, which, if the project concludes without the need for arbitration, will be distributed to the client and team (50%/50%). This provides a soft incentive for cooperative problem-solving between client and team.

Step 3 (for new teams only)

Interested platform participants can sign up to contribute and form a prospective project team. To specify how they will collaborate, participants may write up team operating documents themselves or modify the editable templates Deconet makes available. The roles and processes defined in these operating documents form part of the project application that the team submits to the client.

The team also specifies the ETH address that functions as their "official" team address. Access to this address may be structured to support a single team representative, or use a multi-signature function to accommodate alternative team representation structures.

Step 4

Either party (client or team representative) makes and digitally signs a proposal. An immutable copy of the proposal, including digital signatures, is written to a decentralized ledger. This varies according to the types of work involved, but generally includes:

- Scope of work.
- Timeline, including number of milestones and length of each.
- Budget.
    - Team compensation per milestone.
    - Necessary paid digital assets per milestone, anticipated source and price.
    - Process for provision of any necessary paid digital assets. If outside of Deconet, anticipated protocol for purchase oversight and record-keeping.
    - Anticipated remuneration times.
- Communication Protocol.
    - Anticipated response times.
    - Anticipated communication process & schedule.
- Minimal acceptable scope review and code review scores (see Step 7, below).
- For anticipated asset outputs (both milestone outputs and final outputs), rights to list on/remove from exchanges such as Deconet's Asset Market, whether for optional contribution or pay, for both milestone outputs and final outputs.

- Rights to and method of distribution anticipated for any future income associated with listing any anticipated outputs, for both milestone outputs and final outputs.
- Rights of knowledge workers to access and reuse milestone outputs and final outputs as a component of future commercial or non-commercial work.

Step 5

The receiving party (client or team) can accept and digitally sign, counter and digitally sign, or reject the proposal.[26]

Step 6

If the proposal is accepted, the platform generates a smart contract. The smart contract automates the management and recordkeeping for several aspects of the project, including payment. For work to begin on each milestone, the relevant smart contract payment schedule must designate and receive funds sufficient:

1. To compensate the team for completing the milestone.
2. To compensate a trusted third party in the case of irreconcilable disagreement.
3. To compensate scope reviewers and code reviewers at the client's request.
4. To purchase any digital assets necessary for the team to complete the milestone.
5. To support any administrative or other expenses reasonably required by the team to complete the milestone.

The smart contract is associated with a 2-of-3 key scheme multisignature wallet. Any two of the three keys can unlock the wallet. One key is known only to the client, a second to a person or persons designated by the knowledge workers, and a third by a trusted and neutral third-party platform participant. When approved, the smart contract records the team's operating documents, authorizes the designated team address, and the project request becomes unavailable to other users of the platform.

[26] After a specified length of time, non-responses are considered rejections.

Step 7

The project team delivers the milestone scope within the specified time. Each milestone must be scoped objectively, such that the trusted third key holder can dispassionately evaluate whether it has been achieved as agreed. Depending on the type of work contracted, the prospective team may also create mockups of the milestone. As a result of scoping, the team may suggest adjustments to assets to be sourced, team, budget, timelines, and other aspects of the project specifications. If agreed to by the client, such adjustments must be funded prior to commencement of work.

The client may request a scope review[27] from an independent third-party scope reviewer. If a milestone scope review results in poor scores or if the maximum allotted scoping time is exceeded, the client may terminate the team engagement, and request a return of her funds. In the case of engagement termination prior to commencement of work, the team receives any funds designated by the smart contract to compensate good faith applicants, and the client is offered the option of re-listing the project.

Step 8

Once the client approves the scoped milestone and any associated project mockups, and sufficiently funds the designated smart contract, the system pulls the data from the smart contract and notifies the team that they are authorized to begin work on the milestone, producing the project per the specifications and conditions agreed upon.

Step 9

The client provides feedback on the deliverables within the anticipated response time. For code work, the client may request a code review.

If the time window is exceeded, the team may terminate the project and request a pro rata share of funds from the smart contract escrow.

[27] A scope review evaluates whether, given the project request, the product and technical approach articulated in the scope are sufficiently specific, accurate, feasibly estimable, and in-keeping with Deconet best practice guidelines.

Step 10

After a milestone is completed, the team representative attests to its completion within the smart contract. Once either the client or the trust agent also attest to the milestone's completion, the smart contract releases compensation associated with the milestone to the team member(s) per the payment schedule.

Step 11

To encourage continued learning, both team and client provide 360 degree feedback.

Step 12

Steps 7-11 loop. Depending on learnings from one milestone, the team or the client may propose modifications to the next, which the smart contract is equipped to record within a modifications field. Once agreed, prepaid, and executed, each milestone is attested, and the contract releases the next tranche of compensation.

Step 13

When the final milestone is completed, the client and team rate one another. Control, ownership, usage, access, copyright, authorship, etc. of the assets created depends on the nature of the agreement between the two parties.

4.2.3 Operating Agreements

A subset of platform users will be keen to offer feedback and collaborate with one another to develop improved operating agreement templates. As in other areas, Deconet welcomes and encourages this specialized crowd energy, and may in future develop a system to recognize and/or reward contributions in this area.

4.2.4 Contests

A contest is a project for which compensation is contingent upon qualification for consideration, satisfactory completion of work specified, AND selection as a winner within

the contest rules. While many teams may number among the entrants, few will win. To make up for this risk, Deconet contests typically offer winners large rewards.

Contests create a mechanism for bringing new knowledge workers onto the platform. Contest holders must specify how they will comply with some of the rules, such as how the contest will be judged so as to assure fairness, assure impartiality on the basis of (race, religion, etc.), deter or mitigate unethical practices and cheating (on part of judges, contestants), and assure the judges be qualified to determine the winner.

Where feasible, Deconet requires that contest submissions, including non-winning submissions, be published on the platform and the entrant credited. This mitigates against the loss of the value non-winning contest entrants create. In addition, contest holders may elect to offer non-winning qualified entrants a consolation prize.

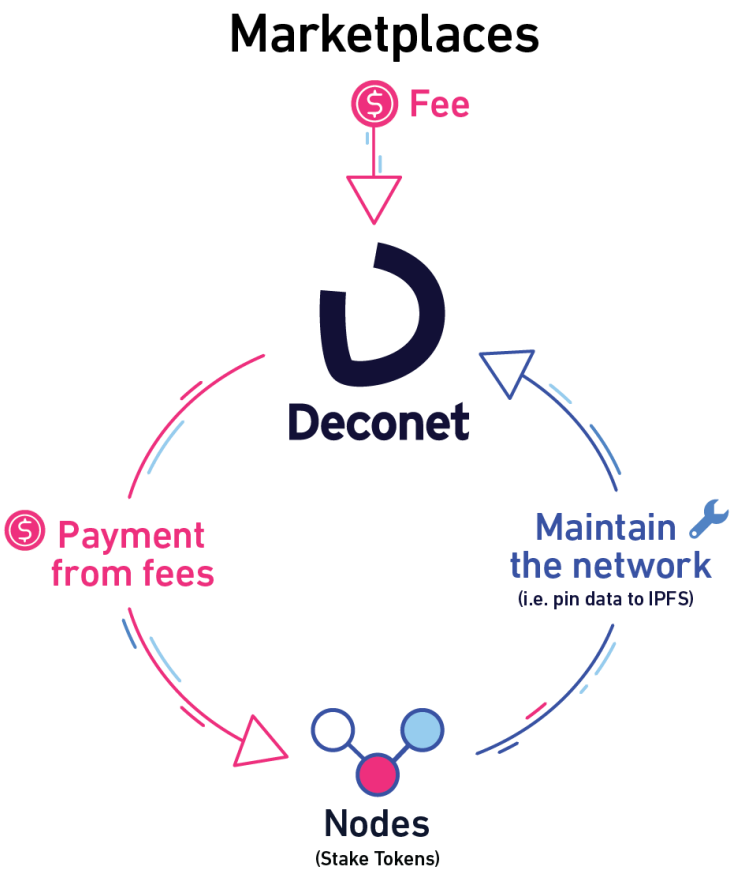
4.3 Technical Components

4.3.1 Overview

Six core interlocking technical assets support platform functionality: Deconodes, Deconet User Tools, the Deconet Token (DCO), Deconet Reputation Systems, Deconet Smart Contracts, and the Deconet Creator Fund.

4.3.2 Deconodes

In order for Deconet to exist as a totally sovereign and decentralized network, nodes are required for the maintaining of this network. In this system, these are called Deconodes. In a generalized sense, each Deconode functions as a container and can serve any number of tasks in maintaining the network.



The initial objective of the nodes is to store the data that Deconet participants depend on, for example, the documentation for a given microservice. In this initial role, Deconodes will pin that data to IPFS. As the network and underlying consensus protocols evolve, the Nodes may maintain the consensus of the ledger as well as decentralized computation for the applications leveraging Deconet. Deconodes stake tokens for the right to maintain the network and prove they are trustworthy. In turn, they are compensated from the fees generated by the Asset and Project Marketplaces.

Deconodes utilize a Proof of Storage mechanism to continuously verify the data being pinned and processed by other nodes. Nodes are proportionally rewarded every 24 hours based on how much data storage and processing tasks they have performed for the network over the last 24 hours. To calculate the payout for a given node, we take their

work performed and divide it by the total work performed by all nodes for the last period, and multiply it by the total network fees.

$$f(n) = \frac{work}{workSum} * totalFees$$

4.3.3 Deconet User Tools

To facilitate asset and project market access, Deconet offers a registry and dashboard. The Deconet Registry is a decentralized registry and repository that enables developers to list and permission their assets, packages, APIs, projects, and other services. The Deconet Dashboard is an interface for users to access, search among, and evaluate Deconet Registry listings.

4.3.4 Deconet Token (DCO)

Token Overview

Deconet will mint and distribute Deconet Token (DCO), an ERC20 Ethereum token, the unit of curation, membership, and staking for the Deconet ecosystem. Deconet is committed to transparency and stability. These values represent a framework for stewardship of the community.

At launch, Deconet will mint 100 percent of the 1,000,000,000 tokens. No further tokens can be created.

Tokens will be available for purchase on Deconet. They are completely functional for their purpose at time of purchase, and will be sent promptly. Please allow for some shipping and

handling delays as we comply strictly with relevant Know Your Customer (KYC) and Anti-Money Laundering (AML) requirements.

Developers who join the testnet and are active are added to a whitelist. This enables them to receive a discount at the time of the Token Generation Event (TGE). Our hope is that the entire token allocation for the TGE will be taken by developers who are active on our testnet.

Token Functions

The Deconet Token facilitates and incentivizes maintenance of the network, platform membership, asset creation, and asset curation.

The Deconodes that maintain the network (in the form of storage, maintaining the ledger, or generalized computation) are required to stake tokens to showcase that they are aligned with the goals of the network and disincentive any malicious actions.

When users want to list an asset, transact on the platform, participate in setting network parameters, or unlock greater rights on the platform, DCO is required. The immutable ledger of a blockchain enables platform participants to interact with fewer fees, middlemen, or friction. Each asset, knowledge worker, team, and project is associated with a unique blockchain address. The amounts of DCO a given address holds or held at any given time are readily verifiable via the blockchain.

The DCO functions as the mechanism for network parameter setting, and powers the invitation system. Token holders determine network design parameters such as the amount of tokens candidates must stake in order to submit a design. DCO features in supply-side participant invitations. Referral and invitation links are redeemable only by holders of DCO, for instance.

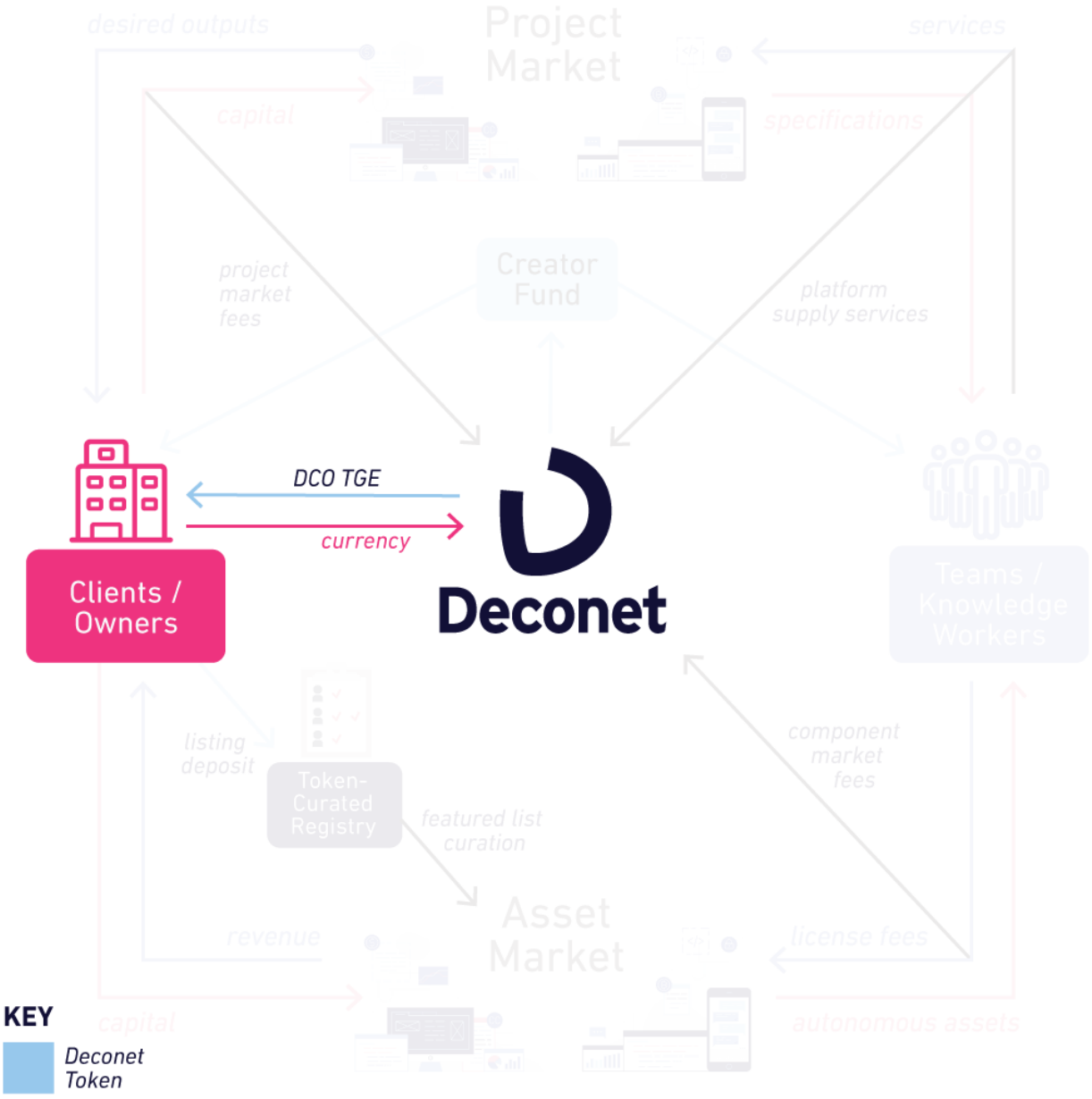


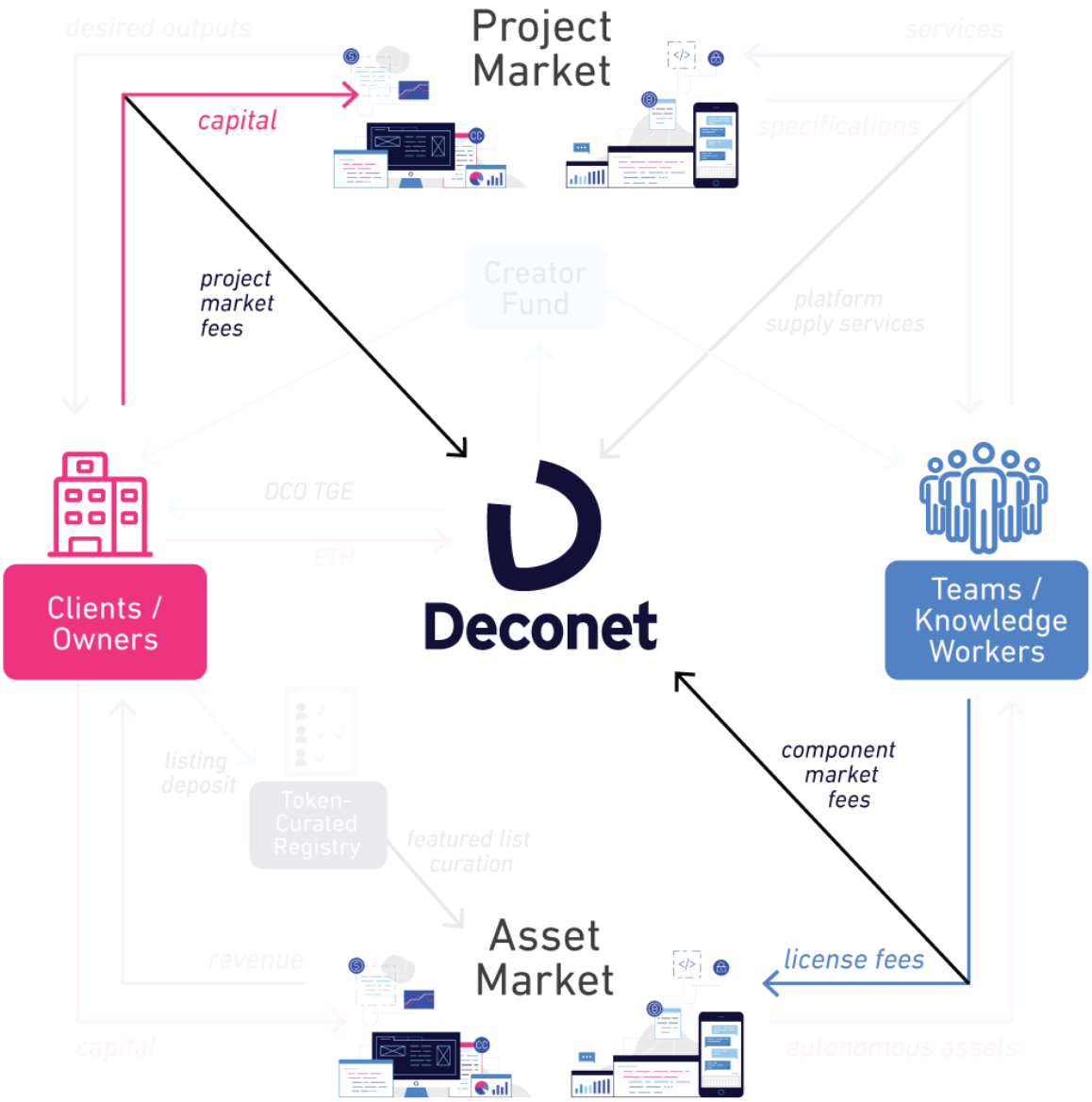
Figure 5. Token Generation Event

Users may also be rewarded for achieving onboarding goals. These may include, for instance:

- First achieving the featured asset list.
- Connecting their account to other services.
- Joining the network chat.

- Referring asset knowledge workers and developers.[28]

Deconet anticipates the potential of ongoing behavior and game theoretic incentives to motivate user behavior. If necessary, Deconet may fund such incentives through de minimis fees associated with project and/or asset market transactions as depicted in Figure 6, below.



[28] DCO distributed in such onboarding processes is part of the supply side acquisition, and are not deducted from the Creator Fund (see section 4.3.6).

Figure 6. Sources of Potential Platform Revenue

Token Rationale

Deconet creates a decentralized marketplace and network rather than a conventional, centralized platform. This enables Deconet to function as a sovereign network as well as have "skin in the game" crowd curation of the supply side of the market. Deconet uses cryptocurrency rather than traditional "fiat" currencies to allow for truly peer-to-peer transactions that are confirmed in minutes rather than days, and to offer network stakeholders publicly verifiable payment history. Rather than using an existing cryptocurrency, Deconet will mint and put into use the DCO for three major reasons.

First, the sovereignty and true decentralization of the network is assured by have the nodes who provide the infrastructure are staking DCO. This aligns the nodes with all network participants.

Second, curation of the Deconet is not be feasible using an existing cryptocurrency. By creating a new token, Deconet can distribute a large portion of the token's total supply in a way that corresponds to contribution to the Deconet ecosystem.

Third, Deconet can raise funds necessary to develop the platform ecosystem by selling a portion of the DCO.

Fourth, development of the Deconet markets can only be directly and efficiently incentivized with DCO. As a result of DCO, some of the value created by the global utility of the network can be captured and transparently shared among early adopters, knowledge workers, and evangelists. Thus, the network directly and efficiently incentivizes participants to increase the network's utility. This mitigates the proverbial "chicken and egg" problem inherent to two-sided marketplace development.

4.3.5 Deconet Reputation Systems

The Deconet platform facilitates interactions among peers who do not otherwise know one another. Clients must be able to confidently assess the authenticity, intentions, and

expertise of a team prior to engaging that team. Knowledge workers require similar information about a prospective client and about one another, prior, for instance, to submitting a project proposal, joining a new team, or welcoming a new team member. We anticipate deploying a native reputation system that offers information regarding platform users, including clients, owners, teams, and knowledge workers. Deconet will also connect to germane and interoperable external reputation systems that track reputation across multiple platforms.

Deconet supports the human development of its users by providing tools for continuous feedback, 360 degree evaluations, and multi-category ratings. Users rate their experience working with one another across multiple relevant categories on a five-point scale, from *needs improvement* to *superb*. For knowledge workers, for instance, categories may include:

- Relevant knowledge
- Timeliness
- Communication with other team members
- Creativity and initiative
- Adaptability and flexibility
- Judgment
- Planning and organization

To support knowledge workers' ongoing development and learning, an optional quarterly Objectives and Key Results system is available for platform users and teams.

Deconet anticipates that a subset of platform users will be interested to develop improved operating agreement templates. As in other areas such as operating agreement template development, we welcome and encourages this specialized crowd energy. Deconet anticipates a system to recognize and reward contributions in this area, which we term *platform support services*.

4.3.6 Deconet Smart Contracts

Deconet Smart Contracts are specialized financial rails that enable unbanked, nonperson entities—such as open-source software projects—to automatically and transparently fund the knowledge workers, vendors, and projects they depend on.

Running on the Ethereum blockchain, interrelated *Curation*, *Commerce*, and *Project Banking* Smart Contracts enable marketplace functionality. Curation and Commerce Contracts govern the assets, packages, and services listed on the Deconet, while Project Banking Contracts "bank" entities such as projects.

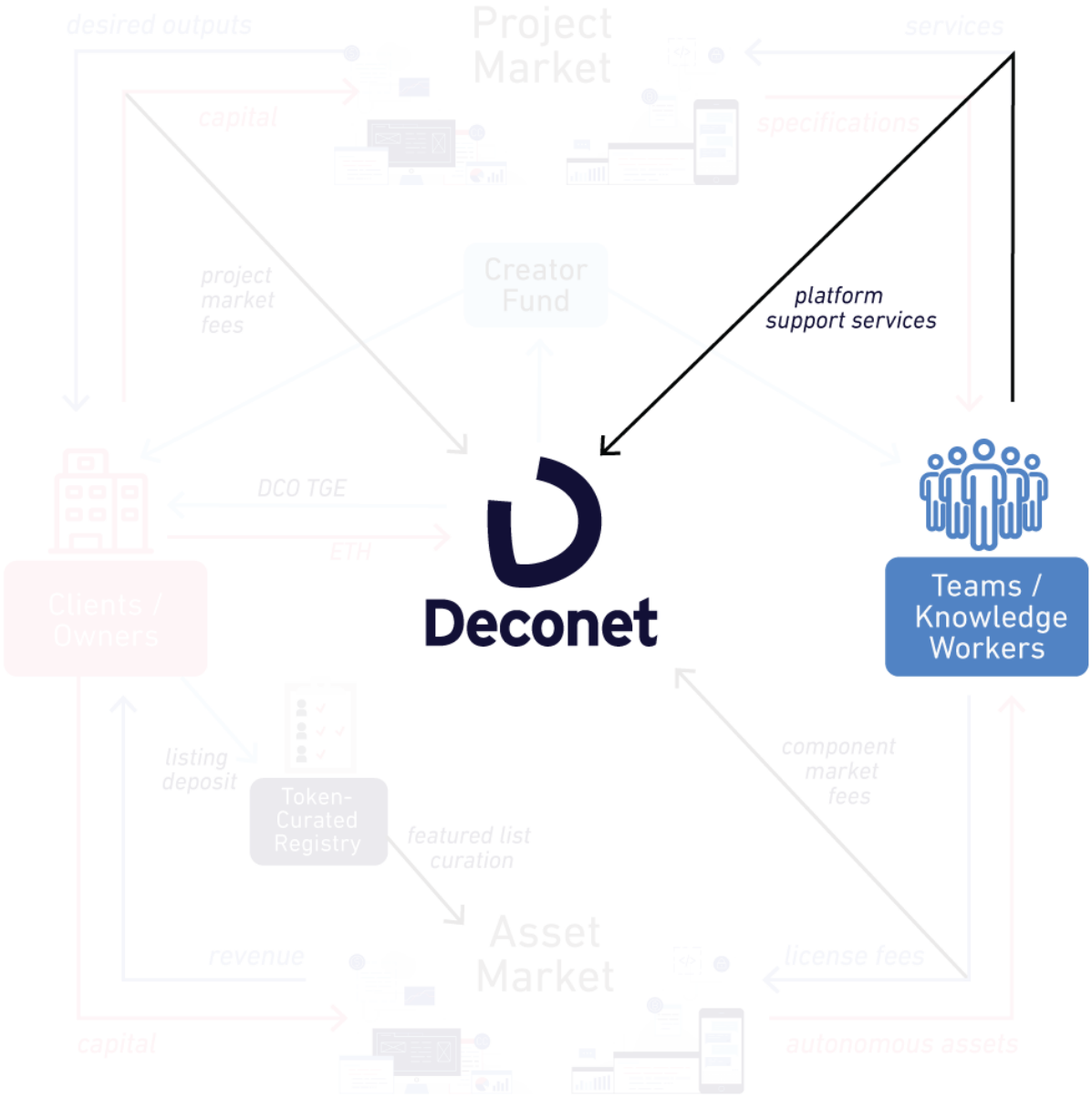


Figure 7. Platform Support Services

The Curation Contract enables the token-curated registry[29] that DCO holders use to curate assets listed on the network. The incentive structure established in the Curation contract motivates token holders to maintain the highest quality and most appropriate supply side content. Token holders are responsible for contract parameterization under this model.

[29] Free Software Foundation, "GNU General Public License," 2007.

This allows, for example, for token holders to update the quantity of tokens required to participate in network curation.

The Commerce contract enables market participants to transact in Ethereum or any approved token. Upon receipt of payment, the purchase of a license or exception is written to the blockchain. The default licensing agreement for assets enables the sale of license exceptions to the GNU GPL.[30] Under this default, developers can access a desired license instantaneously upon purchase, streamlining the buying experience. Asset knowledge workers who prefer to assign their creations a different license may do so.

The Project Banking Contract enables developers with commit access to be assigned a project and to decide how funds that the project receives are distributed. Funds can arrive either via donation or commercialization. This smart contract is written in such a way that governance projects, such as Aragon and DAOstack, can be layered on top.

4.3.7 Deconet Creator Fund

In the past, marketplaces for digital assets (e.g. code) and digital projects (e.g. code development) have met with limited success due in large part to the fact that these over-centralized, non-tokenized platforms were unable to solve the "chicken and egg" problem of developing new two-sided marketplaces.

The Deconet Creator Fund is a pool of DCO that motivates platform participants to list high quality creations and project offerings early and often in exchange for bonuses. The objective of the Fund is to develop rich, thick, and liquid project and asset markets. Funded by the platform, the Fund offers token-based incentives to asset owners that list their creations and knowledge workers and teams that list projects .

We view tokenization as a social technology that enables Deconet to fund and support the platform. DCO held by the Deconet Creator Fund will be released at a logarithmically declining rate. The Fund will incentivize market growth in a distributed fashion, with

[30] Stallman, "Selling Exceptions to the GNU GPL," 2009.

weekly caps on rewards per platform user. To prevent fraud, changes to the rate and structure of the release may also be required.

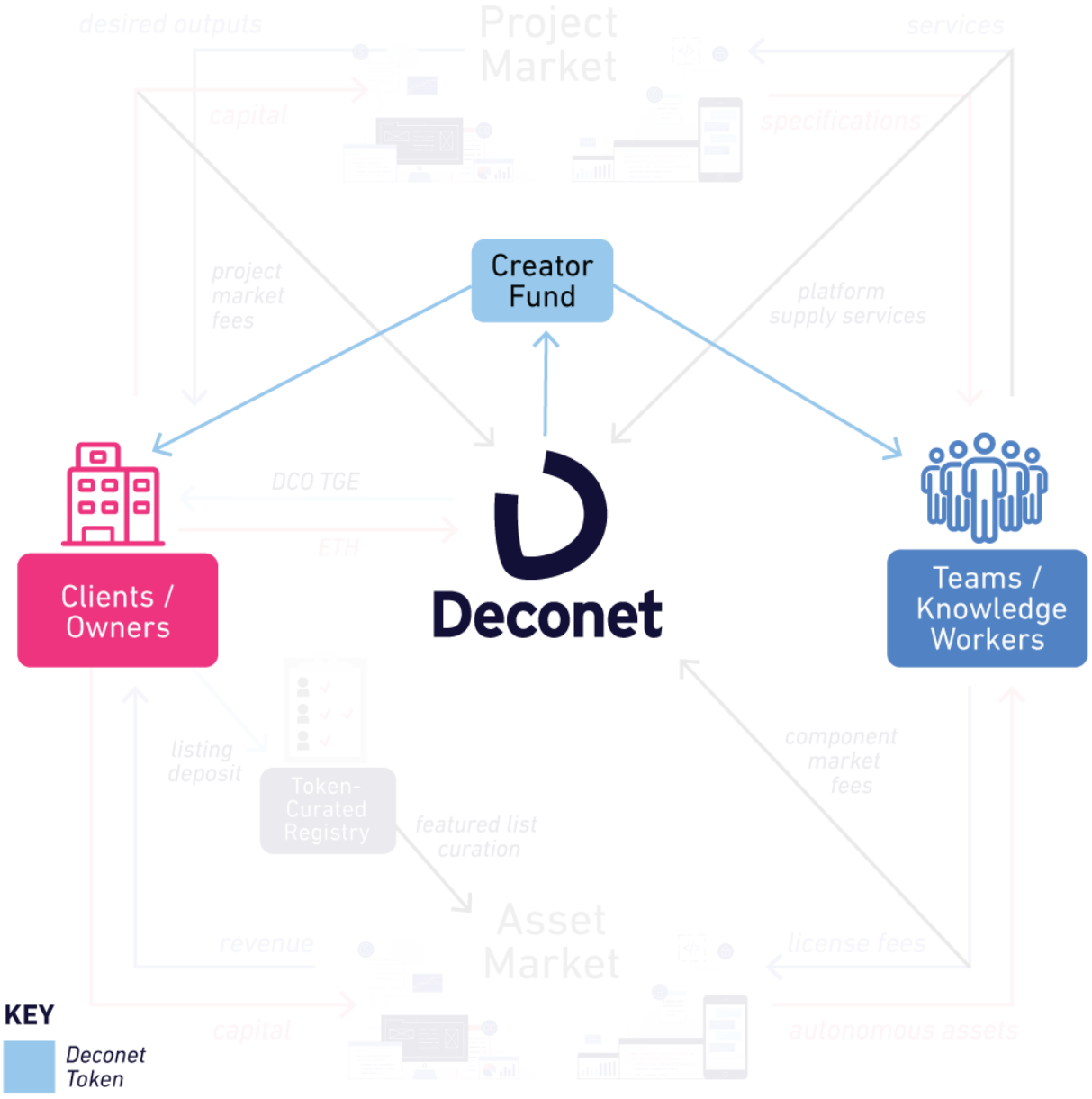


Figure 8. Creator Fund

DCO from the Creator Fund will also power the user advocate system. When DCO holder A invites a new knowledge worker, B, onto the platform, and B sells or licenses an asset or

project, A is rewarded with DCOs. B may also refer C. When C sells or licenses assets or projects on the platform, B is rewarded, and A receives a smaller reward.

By structuring the reward mechanism in this way, the Fund incentivizes the highest quality knowledge workers to join early and invite their most talented and networked friends and colleagues. Since platform early adopters are stickier on average, this could also help early adopters retain the fair value of their contribution as the platform scales up. In this way, the Fund should drive buy-in and reward participant evangelism.

4.4 Development Strategy

Overall, our strategy is to invest in product innovation and decentralization so that better and more complex applications can continue to be built faster and more securely with assets from Deconet.

4.4.1 Version 1

The first iteration of Deconet is a decentralized and custom Git registry where asset owners can list their digital assets, and knowledge workers can access and purchase assets from the marketplace–all directly from their terminals. The Asset Market functions as a push-style marketplace, where assets are presented at the exact moment they are needed, as opposed to requiring a website search.

This first version includes a web portal. We are developing a Chrome extension that shows Deconet-listed assets when the user is searching for assets on centralized registries, such as GitHub, GitLab, and npm. This extension will enable developers to view a greater inventory of assets without altering their workflow.

As we develop out Version 1, our first goal at Deconet is to provide value to ecosystem participants by establishing an asset market with a growing supply of building blocks and by increasing the ways asset knowledge workers can be compensated. The second goal of Deconet is to develop into a fully decentralized, completely autonomous protocol as the

dependent technologies develop. This includes building atop decentralized storage as well as deeper integrations with partners and stable coins.

Deconet leverages the same open-source framework that powers Gitea so developers will feel right at home, and asset knowledge workers and API publishers can sell code and microservices that are built for package managers such as Composer, npm, and Bower.

4.4.2 Version 2

Version 2 iterations will expand Deconet so that it can support code customization, developer services, and project management. To do so, the platform will develop out specialized service-based offers within the platform.

It will also expand the role of token curated registries. The Version 1 token curated Asset Market registry may be expanded to evaluate not only market-*featured* assets, but all market-*listed* assets. It is anticipated that a token-curated registry may also be built to evaluate microservices listed on the Project Market. If applicable, Project Market registry participants may also evaluate project teams whose composition is highly consistent from project to project.

For popular open-source assets that require maintenance through time, but for whom the primary maintainer needs a break, platform users may similarly deploy a token-curated registry to remunerate esteemed platform participants to approve pull requests associated with the asset.

While initial trusted agents are likely to be drawn from Deconet itself, we believe that as the platform expands, a token-curated registry will come to curate a list of highly esteemed trust agents from across the Deconet community.

As development continues on Deconet and its underlying protocol, the Deconet core team and community will work to develop in-depth provisioning, project management, and governance supports for enterprise-facing project teams. In addition to an enterprise project focus, the commercial team at Deconet will propose product partnerships and

integrations with companies focused on complementary areas of knowledge economy asset development and coordination.

4.4.3 Version 3+

Our ambition is to radically enhance the global knowledge economy. Though Deconet will remain model agnostic, this will require our users to integrate with existing governance, project management, intellectual property, and payments frameworks, and to develop out new ones.

We envision a platform that will ultimately support a large variety of project and asset markets. Version 3 use cases foreseen include:

- Legal - e.g. legal document production/customization
- Medical research - e.g. execution/publication of presently non-incentivized research, such as research that is necessary for but does not itself result in a codifiable asset (e.g. a cure)
- Market research - e.g. development & sale of premium reports

5 TEAM

The Deconet core team brings together seasoned leadership, tech genius, and a focus on execution. Readers sometimes ask about our lack of "c-suite" titles. In the spirit of the knowledge worker cooperatives we support, the Deconet core team strives in all of our actions to eschew needless hierarchy and ego-focus, favoring instead a collaborative focus on user-centric execution grounded in sociocentric values. We pride ourselves on the diversity of backgrounds, knowledge, and expertise we collectively represent, along with our shared determination to change the knowledge economy for the better.

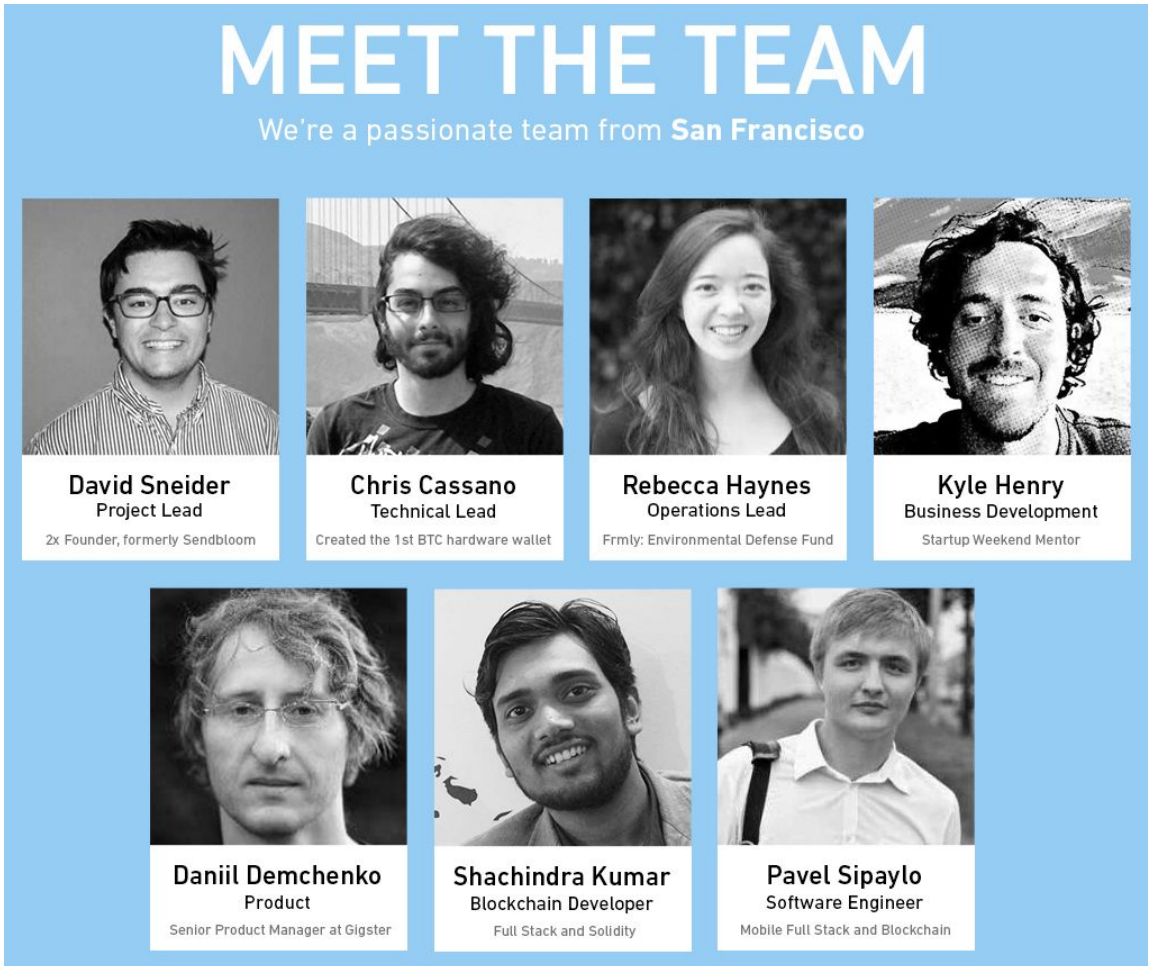


Figure 9. Deconet Core Team

6 SECURITY[31]

Security has been a key consideration throughout the design and development of the Deconet platform.

6.1 Attack Deterrence and Misuse Mitigation

We offer below sample scenarios of potential attacks and misuses of the Deconet platform, and outline Deconet's measures against each.

6.1.1 Asset Market Scenarios

Scenario: A user uploads and attempts to sell an asset which they have no right to sell.

Apart from violating Deconet rules, the user is likely violating copyright law. The record of their action is publicly available, immutably recorded, and easily searchable. They are therefore likely not only to lose access to Deconet, but also to face legal consequences.

Token-curated market participants have a monetary (token) incentive to seek out and challenge plagiaristic submissions. Therefore, if the malicious actor submits said asset to be featured on the Deconet Asset Market, their submission will very likely be challenged, resulting in both the exposure of their Deconet rule violation and the loss of their TCR application stake.

Scenario: A malicious actor uploads a project to the Asset Market. To gain a token reward, he then buys it from himself.

Token rewards are adjusted such that their exchangeable value is less than the transaction fees required to perform this attack.

Scenario: A knowledge worker creates an API. She attempts to charge clients for API calls they didn't make.

[31] Note that *Security* describes the Deconet platform as it is envisioned. In the interest of legibility, we sometimes articulate this vision using the present tense. While Deconet is expanding, some security measures are not yet needed as of the time of this writing. They therefore have not yet been put in place.

The API buyer must approve the amount that can be spent on a per-API basis (measured in Wei per second). This amount defaults to zero. If an API is hosted on Deconet's gateway, then Deconet will not approve a non-zero amount unless corresponding API calls were actually made. If the API is not hosted on Deconet's gateway, the client must approve all charges manually.

Scenario: A knowledge worker creates an API that performs well in the market. But the knowledge worker lies about the amount of API calls that are being made.

If API is hosted on Deconet's gateway, then Deconet does the usage reporting. If the user reports additional usage, Deconet sees the discrepancy and can cut off the API. If the API is not hosted on Deconet's gateway, then it is the responsibility of the API consumer to verify that they are being charged the right amount. Because all interactions are reported reported to the blockchain, everything is transparent.

Scenario: A knowledge worker creates an API that performs well in the market. But, the knowledge worker suddenly raises the price per API call. As a result, callers to the API are charged more than they had expected.

In such a scenario, the reputation of the API will suffer, and it will likely be abandoned. This attack can only be pulled off once, at great risk to the API owner's reputation. In addition, Deconet's smart contracts use a two-step process for charging users for API calls. Deconet reports API call usage amounts, which locks in the price per call. A "settle" operation transfers the ETH from the buyer to the seller. This process is reported with sufficient frequently that the time period for which users can be charged the inflated price is very brief.

6.1.2 Project Market Scenarios

Scenario: A client creates a project on the network. Development begins. The client disappears, or never approves a milestone even though it has been completed.

The standard bounties contract Deconet uses for each milestone supports the role of a trusted agent, who can accept fulfillment in the absence of the client. The reputation of the client will suffer, and will likely be abandoned. This attack can only be pulled off once, at great risk to the client's reputation.

Scenario: A client creates a project on the network. The knowledge worker begins work, but the quality of the work submitted at the milestone is poor.

The client can choose not to approve the milestone given its poor quality. Milestones may include a code review clause. This states that approval is contingent on achievement of a specified minimum code review score.

Scenario: A client creates a project on the network and the knowledge worker begins work, but the client fails to approve the milestone in a timely manner, or is otherwise unreachable for communication.

The smart contract will specify the timelines of milestone approval and for communication. If the client fails to approve a milestone in the time agreed upon, the arbiter may approve it. If the knowledge worker fails to perform according to the specified timeline, the client may terminate their relationship and offer the project to a new developer.

6.2 Partners in Security

We recognize that best-in-class products and vendors have teams dedicated to updated security protections. As Deconet focuses on developing its own core offering, we anticipate working with partners to assure the security of our users and of various aspects of the platform.

Deconet has partnered with Rivetz in order to provide a secure execution environment on a wide range of devices, including smartphones. Additionally, when Rivetz and other partners are not applicable, but knowledge workers have stake to potentially private information, they will be required to stake DCO as a disincentive to information misuse.

Assets that require access to potentially private information can be audited and sandboxed before publication on the platform. This is part of the automated approval process. Using cryptocurrency as an example, pure React Native JS code cannot read from the device keychain, so React Native JS assets is prevented from attempting to read

a user's private key. When an entity attempts to spend from a user's crypto token balance, a modal prompt can also be forced.

With Rivetz, transactions can be signed outside of asset execution space. This provides similar functionality to a hardware wallet or hardware secure asset, widely regarded as a preferred solution for secure data storage.[32] Furthermore, certificate pinning protects against man-in-the-middle attacks and ensures that only authorized application developers may leverage the assets to which they have access.

Where user authentication is required, Deconet anticipates deploying a user authentication system such as Civic.

[32] Rivetz. "Rivetz: The Hardware-Based Security & Identity Ecosystem," n.d.

7 CONCLUSION

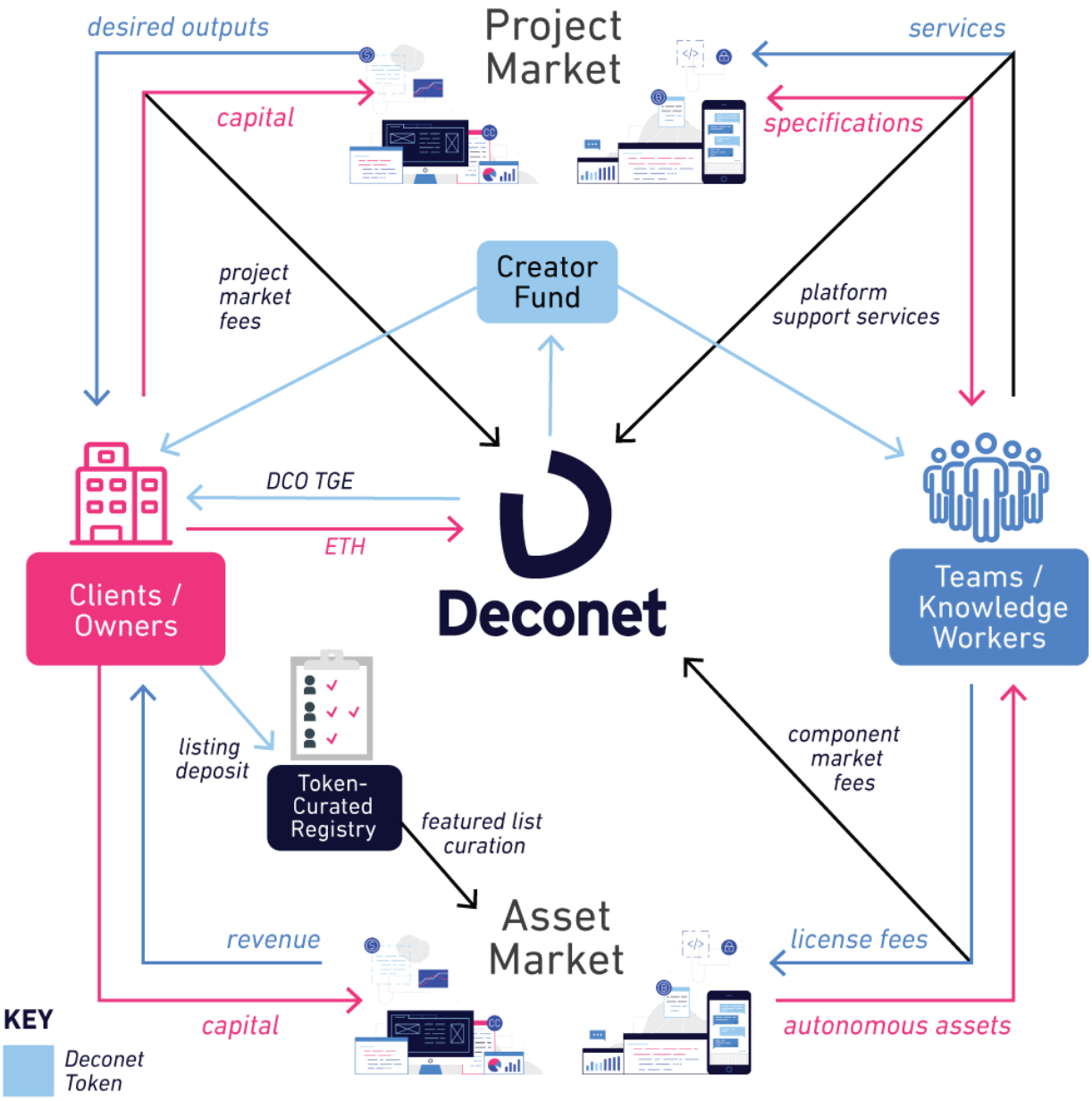


Figure 10. System Overview

The knowledge economy can be understood in terms of interactions among clients, owners, knowledge workers, and teams. The blockchain enables these groups to work together in new ways. Figure 10, above, pictures the Deconet platform as a single self sovereign system. Nodes maintaining the network, processes encoded in smart contracts, along with collaborative curation enabled through token-curated registries, allow Deconet

users to develop novel ways to coordinate shared work more efficiently, fairly, sustainably, inclusively, and effectively.

8 ACKNOWLEDGMENTS

In addition to the dedication and extraordinary efforts of the Deconet Core Team, we gratefully acknowledge the contribution of the many others without whom the present paper would not have been possible. For her wonderful graphic and visual design, we thank Leah Wansley. David Passiak and Chelsea Rustrum offered innumerable useful suggestions and ideas that helped to shape the present work. We also owe a debt of gratitude to the editorial acumen of Michael P. Williams. Finally, we gratefully acknowledge the work of our white paper writer, Brennan O'Rear.

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